ETSI TS 138 413 V17.1.1 (2022-08)



5G; NG-RAN; NG Application Protocol (NGAP) (3GPP TS 38.413 version 17.1.1 Release 17)



Reference RTS/TSGR-0338413vh11 Keywords 5G

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Foreword

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

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

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- x the first digit:
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- Y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the radio network layer signalling protocol for the NG interface. The NG Application Protocol (NGAP) supports the functions of the NG interface by signalling procedures defined in this document. NGAP is developed in accordance to the general principles stated in TS 38.401 [2] and TS 38.410 [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 38.410: "NG-RAN; NG general aspects and principles".
[4]	ITU-T Recommendation X.691 (07/2002): "Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
[5]	ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".
[6]	$ITU-T\ Recommendation\ X.681\ (07/2002):\ "Information\ technology-Abstract\ Syntax\ Notation\ One\ (ASN.1):\ Information\ object\ specification".$
[7]	3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error handling".
[8]	3GPP TS 38.300: "NR; NR and NG-RAN Overall Description; Stage 2".
[9]	3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".
[10]	3GPP TS 23.502: "Procedures for the 5G System; Stage 2".
[11]	3GPP TS 32.422: "Trace control and configuration management".
[12]	3GPP TS 38.304: "NR; User Equipment (UE) procedures in idle mode and in RRC inactive state".
[13]	3GPP TS 33.501: "Security architecture and procedures for 5G System".
[14]	3GPP TS 38.414: "NG-RAN; NG data transport".
[15]	3GPP TS 29.281: "General Packet Radio System (GPRS); Tunnelling Protocol User Plane (GTPv1-U)".
[16]	3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".
[17]	3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".
[18]	3GPP TS 38.331: "NG-RAN; Radio Resource Control (RRC) Protocol Specification".
[19]	3GPP TS 38.455: "NG-RAN; NR Positioning Protocol A (NRPPa)".

[20]	3GPP TS 23.007: "Technical Specification Group Core Network Terminals; Restoration procedures".
[21]	3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol specification".
[22]	3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
[23]	3GPP TS 23.003: "Numbering, addressing and identification".
[24]	3GPP TS 38.423: "NG-RAN; Xn Application Protocol (XnAP)".
[25]	IETF RFC 5905 (2010-06): "Network Time Protocol Version 4: Protocol and Algorithms Specification".
[26]	3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
[27]	3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".
[28]	3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".
[29]	3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".
[30]	3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3".
[31]	3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".
[32]	3GPP TS 37.340: " Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multiconnectivity; Stage 2".
[33]	3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".
[34]	3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".
[35]	3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
[36]	3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".
[37]	CableLabs WR-TR-5WWC-ARCH: "5G Wireless Wireline Converged Core Architecture".
[38]	3GPP TS 36.401: "E-UTRAN Architecture Description".
[39]	3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".
[40]	3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP) ".
[41]	3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA), Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".
[42]	3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities".
[43]	3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".
[44]	3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".
[45]	3GPP TS 28.405: "Telecommunication management; Quality of Experience (QoE) measurement collection; Control and configuration".
[46]	3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".
[47]	3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[48]	3GPP TS 38.314: "NR; Layer 2 Measurements".
[49]	3GPP TS 36.314: "Evolved Universal Terrestrial Radio Access (E-UTRA); Layer 2 - Measurements".
[50]	3GPP TS 23.203: "Policy and charging control architecture".
[51]	$3GPP\ TS\ 26.114$: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction".
[52]	3GPP TS 26.118: "Virtual Reality (VR) profiles for streaming applications".

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].

ACL functionality: as defined in TS 36.413 [16].

CAG cell: as defined in TS 38.300 [8].

DAPS Handover: as defined in TS 38.300 [8].

Elementary Procedure: NGAP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the NG-RAN node and the AMF. 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 NGAP EPs together or together with EPs from other interfaces is specified in stage 2 specifications (e.g., TS 38.401 [2], TS 38.410 [3] and TS 38.300 [8]).

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.

en-gNB: as defined in TS 37.340 [32].

gNB: as defined in TS 38.300 [8].

NB-IoT: as defined in TS 36.300 [17].

ng-eNB: as defined in TS 38.300 [8].

NG-RAN node: as defined in TS 38.300 [8].

Non-CAG cell: as defined in TS 38.300 [8].

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

Public Network Integrated NPN: as defined in TS 23.501 [9].

Stand-alone Non-Public Network: as defined in TS 23.501 [9].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

5GC 5G Core Network 5QI 5G QoS Identifier ACL Access Control List

AMF Access and Mobility Management Function

CAG Closed Access Group CGI Cell Global Identifier

CP Control Plane

DAPS Dual Active Protocol Stacks

DC Dual Connectivity

DL Downlink

EPC Evolved Packet Core

FN-RG Fixed Network Residential Gateway GUAMI Globally Unique AMF Identifier

HFC Hybrid Fiber-Coax

IAB Integrated Access and Backhaul

IMEISV International Mobile station Equipment Identity and Software Version number

LMF Location Management Function
MBS Multicast/Broadcast Service
N3IWF Non 3GPP InterWorking Function
NB-IoT Narrow Band Internet of Things

NID Network Identifier
NGAP NG Application Protocol
NPN Non-Public Network

NRPPa NR Positioning Protocol Annex NSAG Network Slice AS Group NSCI New Security Context Indicator

NSSAI Network Slice Selection Assistance Information

OTDOA Observed Time Difference of Arrival

PEIPS Paging Early Indication with Paging Subgrouping PNI-NPN Public Network Integrated Non-Public Network

ProSe Proximity Services
PSCell Primary SCG Cell
PTP Point to Point
PTM Point to Multipoint

QMC QoE Measurement Collection

QoE Quality of Experience RedCap Reduced Capability

RIM Remote Interference Management

RIM-RS RIM Reference Signal

RSN Redundancy Sequence Number

SCG Secondary Cell Group

SCTP Stream Control Transmission Protocol

SgNB Secondary gNB

SMF Session Management Function
S-NG-RAN node Secondary NG-RAN node
SNPN Stand-alone Non-Public Network

S-NSSAI Single Network Slice Selection Assistance Information

TAC Tracking Area Code
TAI Tracking Area Identity

TNAP Trusted Non-3GPP Access Point
TNGF Trusted Non-3GPP Gateway Function
TNLA Transport Network Layer Association

TWAP Trusted WLAN Access Point

TWIF Trusted WLAN Interworking Function

UL Uplink UP User Plane

UPF User Plane Function V2X Vehicle-to-Everything

W-AGF Wireline Access Gateway Function

WUS Wake Up Signal

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.,

Procedure Name 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., MESSAGE NAME message.

IE When referring to an information element (IE) in the specification the *Information Element Name*

is written with the first letters in each word in upper case characters and all letters in Italic font

followed by the abbreviation "IE", e.g., Information Element 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 subclause 9.2 enclosed by quotation marks, e.g., "Value".

5 NGAP Services

NGAP provides the signalling service between the NG-RAN node and the AMF that is required to fulfil the NGAP functions described in TS 38.410 [3]. NGAP services are divided into two groups:

Non UE-associated services: They are related to the whole NG interface instance between the NG-RAN node and

AMF utilising a non UE-associated signalling connection.

UE-associated services: They are related to one UE. NGAP functions that provide these services are

associated with a UE-associated signalling connection that is maintained for the UE

in question.

6 Services Expected from Signalling Transport

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

7 Functions of NGAP

The functions of NGAP are described in TS 38.410 [3].

8 NGAP Procedures

8.1 List of NGAP 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 8.1-1: Class 1 procedures

Elementary	Initiating Message	Successful Outcome	Unsuccessful Outcome
Procedure		Response message	Response message
AMF	AMF CONFIGURATION	AMF CONFIGURATION	AMF CONFIGURATION
Configuration Update	UPDATE	UPDATE ACKNOWLEDGE	UPDATE FAILURE
RAN	RAN CONFIGURATION	RAN CONFIGURATION	RAN CONFIGURATION
Configuration Update	UPDATE	UPDATE ACKNOWLEDGE	UPDATE FAILURE
Handover	HANDOVER CANCEL	HANDOVER CANCEL	
Cancellation	HANDOVED	ACKNOWLEDGE	HANDOVED
Handover Preparation	HANDOVER REQUIRED	HANDOVER COMMAND	HANDOVER PREPARATION FAILURE
Handover	HANDOVER REQUEST	HANDOVER REQUEST	HANDOVER FAILURE
Resource Allocation	1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ACKNOWLEDGE	7771120112
Initial Context	INITIAL CONTEXT	INITIAL CONTEXT SETUP	INITIAL CONTEXT SETUP
Setup	SETUP REQUEST	RESPONSE	FAILURE
NG Reset	NG RESET	NG RESET ACKNOWLEDGE	
NG Setup	NG SETUP REQUEST	NG SETUP RESPONSE	NG SETUP FAILURE
Path Switch	PATH SWITCH	PATH SWITCH REQUEST	PATH SWITCH REQUEST
Request	REQUEST	ACKNOWLEDGE	FAILURE
PDU Session	PDU SESSION	PDU SESSION	
Resource	RESOURCE MODIFY	RESOURCE MODIFY	
Modify	REQUEST	RESPONSE	
PDU Session	PDU SESSION	PDU SESSION	
Resource	RESOURCE MODIFY	RESOURCE MODIFY	
Modify	INDICATION	CONFIRM	
Indication	BBU SESSION		
PDU Session	PDU SESSION	PDU SESSION	
Resource	RESOURCE RELEASE	RESOURCE RELEASE	
Release PDU Session	COMMAND PDU SESSION	RESPONSE PDU SESSION	
Resource Setup	RESOURCE SETUP REQUEST	RESOURCE SETUP RESPONSE	
UE Context	UE CONTEXT	UE CONTEXT	UE CONTEXT
Modification	MODIFICATION REQUEST	MODIFICATION RESPONSE	MODIFICATION FAILURE
UE Context	UE CONTEXT	UE CONTEXT RELEASE	
Release	RELEASE COMMAND	COMPLETE	
Write-Replace	WRITE-REPLACE WARNING REQUEST	WRITE-REPLACE	
Warning PWS Cancel	PWS CANCEL	WARNING RESPONSE PWS CANCEL	
	REQUEST	RESPONSE	
UE Radio	UE RADIO	UE RADIO CAPABILITY	
Capability Check	CAPABILITY CHECK REQUEST	CHECK RESPONSE	
UE Context	UE CONTEXT	UE CONTEXT SUSPEND	UE CONTEXT SUSPEND
Suspend	SUSPEND REQUEST	RESPONSE	FAILURE
UE Context	UE CONTEXT	UE CONTEXT RESUME	UE CONTEXT RESUME
Resume	RESUME REQUEST	RESPONSE	FAILURE
UE Radio	UE RADIO	UE RADIO CAPABILITY	
Capability ID	CAPABILITY ID	ID MAPPING RESPONSE	
Mapping	MAPPING REQUEST		
Broadcast	BROADCAST	BROADCAST SESSION	BROADCAST SESSION
Session Setup	SESSION SETUP REQUEST	SETUP RESPONSE	SETUP FAILURE
Broadcast	BROADCAST	BROADCAST SESSION	BROADCAST SESSION
Session	SESSION	MODIFICATION	MODIFICATION FAILURE
Modification	MODIFICATION	RESPONSE	
1 2	REQUEST	_	
Broadcast	BROADCAST	BROADCAST SESSION	
Session	SESSION RELEASE	RELEASE RESPONSE	
Release	REQUEST		
Distribution	DISTRIBUTION SETUP	DISTRIBUTION SETUP	DISTRIBUTION SETUP
Setup	REQUEST	RESPONSE	FAILURE

Distribution	DISTRIBUTION	DISTRIBUTION RELEASE	
Release	RELEASE REQUEST	RESPONSE	
Multicast	MULTICAST SESSION	MULTICAST SESSION	MULTICAST SESSION
Session	ACTIVATION	ACTIVATION RESPONSE	ACTIVATION FAILURE
Activation	REQUEST		
Multicast	MULTICAST SESSION	MULTICAST SESSION	
Session	DEACTIVATION	DEACTIVATION	
Deactivation	REQUEST	RESPONSE	
Multicast	MULTICAST SESSION	MULTICAST SESSION	MULTICAST SESSION
Session Update	UPDATE REQUEST	UPDATE RESPONSE	UPDATE FAILURE

Table 8.1-2: Class 2 procedures

Elementary Procedure	Message
Downlink RAN Configuration Transfer	DOWNLINK RAN CONFIGURATION TRANSFER
Downlink RAN Status Transfer	DOWNLINK RAN STATUS TRANSFER
Downlink NAS Transport	DOWNLINK NAS TRANSPORT
Error Indication	ERROR INDICATION
Uplink RAN Configuration Transfer	UPLINK RAN CONFIGURATION TRANSFER
Uplink RAN Status Transfer	UPLINK RAN STATUS TRANSFER
Handover Notification	HANDOVER NOTIFY
Initial UE Message	INITIAL UE MESSAGE
NAS Non Delivery Indication	NAS NON DELIVERY INDICATION
Paging	PAGING
PDU Session Resource Notify	PDU SESSION RESOURCE NOTIFY
Reroute NAS Request	REROUTE NAS REQUEST
UE Context Release Request	UE CONTEXT RELEASE REQUEST
Uplink NAS Transport	UPLINK NAS TRANSPORT
AMF Status Indication	AMF STATUS INDICATION
PWS Restart Indication	PWS RESTART INDICATION
PWS Failure Indication	PWS FAILURE INDICATION
Downlink UE Associated NRPPa Transport	DOWNLINK UE ASSOCIATED NRPPA TRANSPORT
Uplink UE Associated NRPPa Transport	UPLINK UE ASSOCIATED NRPPA TRANSPORT
Downlink Non UE Associated NRPPa	DOWNLINK NON UE ASSOCIATED NRPPA
Transport	TRANSPORT
Uplink Non UE Associated NRPPa Transport	UPLINK NON UE ASSOCIATED NRPPA TRANSPORT
Trace Start	TRACE START
Trace Failure Indication	TRACE FAILURE INDICATION
Deactivate Trace	DEACTIVATE TRACE
Cell Traffic Trace	CELL TRAFFIC TRACE
Location Reporting Control	LOCATION REPORTING CONTROL
Location Reporting Failure Indication	LOCATION REPORTING FAILURE INDICATION
Location Report	LOCATION REPORT
UE TNLA Binding Release	UE TNLA BINDING RELEASE REQUEST
UE Radio Capability Info Indication	UE RADIO CAPABILITY INFO INDICATION
RRC Inactive Transition Report	RRC INACTIVE TRANSITION REPORT
Overload Start	OVERLOAD START
Overload Stop	OVERLOAD STOP
Secondary RAT Data Usage Report	SECONDARY RAT DATA USAGE REPORT
Uplink RIM Information Transfer	UPLINK RIM INFORMATION TRANSFER
Downlink RIM Information Transfer	DOWNLINK RIM INFORMATION TRANSFER
Retrieve UE Information	RETRIEVE UE INFORMATION
UE Information Transfer	UE INFORMATION TRANSFER
RAN CP Relocation Indication	RAN CP RELOCATION INDICATION
Connection Establishment Indication	CONNECTION ESTABLISHMENT INDICATION
AMF CP Relocation Indication	AMF CP RELOCATION INDICATION
Handover Success	HANDOVER SUCCESS
Uplink RAN Early Status Transfer	UPLINK RAN EARLY STATUS TRANSFER
Downlink RAN Early Status Transfer	DOWNLINK RAN EARLY STATUS TRANSFER
Multicast Group Paging	MULTICAST GROUP PAGING
Broadcast Session Release Required	BROADCAST SESSION RELEASE REQUIRED

8.2 PDU Session Management Procedures

8.2.1 PDU Session Resource Setup

8.2.1.1 General

The purpose of the PDU Session Resource Setup procedure is to assign resources on Uu and NG-U for one or several PDU sessions and the corresponding QoS flows, and to setup corresponding DRBs for a given UE. The procedure uses UE-associated signalling.

8.2.1.2 Successful Operation

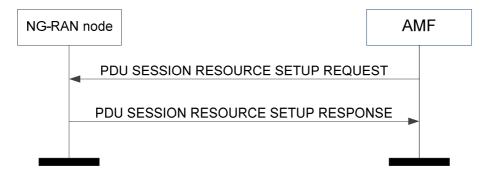


Figure 8.2.1.2-1: PDU session resource setup: successful operation

The AMF initiates the procedure by sending a PDU SESSION RESOURCE SETUP REQUEST message to the NG-RAN node.

The PDU SESSION RESOURCE SETUP REQUEST message shall contain the information required by the NG-RAN node to setup the PDU session related NG-RAN configuration consisting of at least one PDU session resource and include each PDU session resource to setup in the *PDU Session Resource Setup Request List* IE.

Upon reception of the PDU SESSION RESOURCE SETUP REQUEST message, if resources are available for the requested configuration, the NG-RAN node shall execute the requested NG-RAN configuration and allocate associated resources over NG and over Uu for each PDU session listed in the *PDU Session Resource Setup Request List* IE.

If the *RAN Paging Priority* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may use it to determine a priority for paging the UE in RRC_INACTIVE state.

For each requested PDU session, if resources are available for the requested configuration, the NG-RAN node shall establish at least one DRB and associate each accepted QoS flow of the PDU session which is not associated with an MBS QoS flow to a DRB established.

For each PDU session successfully established the NG-RAN node shall pass to the UE the *PDU Session NAS-PDU* IE, if included. The NG-RAN node shall not send to the UE the PDU Session NAS PDUs associated to the failed PDU sessions.

If the *NAS-PDU* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall pass it to the UE.

For each PDU session the NG-RAN node shall store the *UL NG-U UP TNL Information* IE included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message and use it as the uplink termination point for the user plane data for this PDU session.

For each PDU session, if the Additional UL NG-U UP TNL Information IE is included in the PDU Session Resource Setup Request Transfer IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may allocate for this split PDU session resources for an additional NG-U transport bearer for some or all of the QoS flows present in the QoS Flow Setup Request List IE and it shall indicate these QoS flows in the Additional DL QoS Flow per TNL Information IE in the PDU Session Resource Setup Response Transfer IE. In case the Additional DL QoS Flow per TNL Information IE is not included the SMF shall consider the proposed additional UL NG-U UP TNL information as available again.

For each PDU session, if the *Network Instance* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message and the *Common Network Instance* IE is not present, the NG-RAN node shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [9].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource Setup Request Transfer* IE or in the *Additional UL NG-U UP TNL Information* IE, or in the *Additional Redundant UL NG-U UP TNL Information* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it when selecting transport network resource for the concerned NG-U transport bearer as specified in TS 23.501 [9].

For each PDU session, if the *Redundant UL NG-U UP TNL Information* IE is included in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it as the uplink termination point for the user plane data for this PDU session for the redundant transmission and it shall include the *Redundant QoS Flow per TNL Information* IE in the *PDU Session Resource Setup Response Transfer* IE as described in TS 23.501 [9].

For each PDU session, if the Additional Redundant UL NG-U UP TNL Information IE is included in the PDU Session Resource Setup Request Transfer IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may allocate for this split PDU session resources for an additional redundant NG-U transport bearer for some or all of the QoS flows present in the QoS Flow Setup Request List IE and it shall indicate these QoS flows in the Additional Redundant DL QoS Flow per TNL Information IE in the PDU Session Resource Setup Response Transfer IE. In case the Additional Redundant DL QoS Flow per TNL Information IE is not included the SMF shall consider the proposed additional Redundant UL NG-U UP TNL information as available again.

For each PDU session, if the *Redundant Common Network Instance* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it when selecting transport network resource for the redundant transmission as specified in TS 23.501 [9].

For each PDU session, if the TSC Traffic Characteristics IE is included in the PDU Session Resource Setup Request Transfer IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store it and use it as specified in TS 23.501 [9].

For each PDU session, if the *PDU Session Type* IE included in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message is set to "ethernet", the NG-RAN node may perform appropriate header compression for the concerned PDU session, or if it is set to "unstructured", the NG-RAN node shall not perform header compression for the concerned PDU session.

For each PDU session for which the Security Indication IE is included in the PDU Session Resource Setup Request Transfer IE of the PDU SESSION RESOURCE SETUP REQUEST message, and the Integrity Protection Indication IE or Confidentiality Protection Indication IE is set to "required", then the NG-RAN node shall perform user plane integrity protection or ciphering, respectively, for the concerned PDU session. If the NG-RAN node cannot perform the user plane integrity protection or ciphering, it shall reject the setup of the PDU session resources with an appropriate cause value.

If the NG-RAN node is an ng-eNB, it shall reject all PDU sessions for which the *Integrity Protection Indication* IE is set to "required".

For each PDU session for which the Security Indication IE is included in the PDU Session Resource Setup Request Transfer IE of the PDU SESSION RESOURCE SETUP REQUEST message, and the Integrity Protection Indication IE or Confidentiality Protection Indication IE is set to "preferred", then the NG-RAN node 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 Response Transfer IE of the PDU SESSION RESOURCE SETUP RESPONSE message.

For each PDU session for which the *Maximum Integrity Protected Data Rate Downlink* IE or the *Maximum Integrity Protected Data Rate Uplink* IE are included in the *Security Indication* IE in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store the respective information and, if integrity protection is to be performed for the PDU session, it shall enforce the traffic limits corresponding to the received values, for the concerned PDU session and concerned UE, as specified in TS 23.501 [9].

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message:

- if the *Integrity Protection Indication* IE is set to "not needed", then the NG-RAN node 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 NG-RAN node shall not perform user plane ciphering for the concerned PDU session.

For each PDU session for which the *PDU Session Aggregate Maximum Bit Rate* IE is included in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store the received value in the UE context and use it when enforcing traffic policing for Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].

For each PDU session in the PDU SESSION RESOURCE SETUP REQUEST message, if the *Additional QoS Flow Information* IE is included in the *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may consider it for the DRB allocation process. It is up to NG-RAN node implementation to decide whether and how to use it.

For each PDU session in the PDU SESSION RESOURCE SETUP REQUEST message, if the *Alternative QoS Parameters Set List* IE is included in the *GBR QoS Flow Information* IE in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may accept the setup of the QoS flow when notification control has been enabled if the requested QoS parameters or at least one of the alternative QoS parameters sets can be fulfilled at the time of setup. In case the NG-RAN node accepts the setup fulfilling one of the alternative QoS parameters it shall indicate the alternative QoS parameters set which it currently fulfils in the *Current QoS Parameters Set Index* IE within the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE SETUP RESPONSE message.

For each QoS flow which has been successfully established, the NG-RAN node shall, if supported, store the *Redundant QoS Flow Indicator* IE if included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message and consider it for the redundant transmission as specified in TS 23.501 [9].

For each QoS flow which has been successfully established, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

For each QoS flow requested to be setup the NG-RAN node shall take into account the received *QoS Flow Level QoS Parameters* IE. For each QoS flow the NG-RAN node shall establish or modify the resources according to the values of the *Allocation and Retention Priority* IE (priority level and pre-emption indicators) and the resource situation as follows:

- The NG-RAN node shall consider the priority level of the requested QoS flow, when deciding on the resource allocation.
- The priority levels and the pre-emption indicators may (individually or in combination) be used to determine whether the QoS flow setup has to be performed unconditionally and immediately. If the requested QoS flow is marked as "may trigger pre-emption" and the resource situation requires so, the NG-RAN node may trigger the pre-emption procedure which may then cause the forced release of a lower priority QoS flow which is marked as "pre-emptable". Whilst the process and the extent of the pre-emption procedure are operator-dependent, the pre-emption indicators shall be treated as follows:
 - 1. The values of the last received *Pre-emption Vulnerability* IE and *Priority Level* IE shall prevail.
 - 2. If the *Pre-emption Capability* IE is set to "may trigger pre-emption", then this allocation request may trigger the pre-emption procedure.
 - 3. If the *Pre-emption Capability* IE is set to "shall not trigger pre-emption", then this allocation request shall not trigger the pre-emption procedure.
 - 4. If the *Pre-emption Vulnerability* IE is set to "pre-emptable", then this QoS flow shall be included in the pre-emption process.

- 5. If the *Pre-emption Vulnerability* IE is set to "not pre-emptable", then this QoS flow shall not be included in the pre-emption process.
- The NG-RAN node pre-emption process shall keep the following rules:
 - 1. The NG-RAN node shall only pre-empt QoS flows with lower priority, in ascending order of priority.
 - 2. The pre-emption may be done for QoS flows belonging to the same UE or to other UEs.

For each QoS flow which has been successfully established, the NG-RAN node shall store the mapped E-RAB ID if included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message and use it as specified in TS 38.300 [8].

For each PDU session, if the *Redundant PDU Session Information* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store the received information in the UE context and setup the redundant user plane for the redundant PDU session as specified in TS38.300 [8] and TS 23.501 [9]. If the *PDU Session Type* IE is set to "ethernet" and the redundancy requirement is fulfilled using a secondary NG-RAN node, the NG-RAN node shall, if supported, include the *Global RAN Node ID of Secondary NG-RAN Node* IE in the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE SETUP RESPONSE message. If the *PDU Session Pair ID* IE is included in the *Redundant PDU Session Information* IE, the NG-RAN node may use it to identify the paired PDU sessions.

The NG-RAN node shall report to the AMF in the PDU SESSION RESOURCE SETUP RESPONSE message the result for each PDU session resource requested to be setup:

- For each PDU session resource successfully setup, the *PDU Session Resource Setup Response Transfer* IE shall be included containing:
 - 1. The NG-U UP transport layer information to be used for the PDU session and associated list of QoS flows which have been successfully established, in the *QoS Flow per TNL Information* IE.
 - 2. The list of QoS flows which failed to be established, if any, in the *QoS Flow Failed to Setup List* IE. When the NG-RAN node reports unsuccessful establishment of a QoS flow, the cause value should be precise enough to enable the SMF to know the reason for the unsuccessful establishment.
- For each PDU session resource which failed to be setup, the *PDU Session Resource Setup Unsuccessful Transfer* IE shall be included containing a cause value that should be precise enough to enable the SMF to know the reason for the unsuccessful establishment.

Upon reception of the PDU SESSION RESOURCE SETUP RESPONSE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Setup Response Transfer* IE or *PDU Session Resource Setup Unsuccessful Transfer* IE to the SMF associated with the concerned PDU session.

Upon reception of the PDU SESSION RESOURCE SETUP REQUEST message to setup a QoS flow for IMS voice, if the NG-RAN node is not able to support IMS voice, the NG-RAN node shall initiate EPS fallback or RAT fallback for IMS voice procedure as specified in TS 23.501 [9] and report unsuccessful establishment of the QoS flow in the *PDU Session Resource Setup Response Transfer* IE or in the *PDU Session Resource Setup Unsuccessful Transfer* IE with cause value "IMS voice EPS fallback or RAT fallback triggered".

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE SETUP RESPONSE message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

The *UE Aggregate Maximum Bit Rate* IE should be sent to the NG-RAN node if the AMF has not sent it previously. If it is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store the UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

If the *UE Slice Maximum Bit Rate List* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store the UE Slice Maximum Bit Rate List in the UE context, and use it for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

Interactions with Handover Preparation procedure:

If a handover becomes necessary during the PDU Session Resource Setup procedure, the NG-RAN node may interrupt the ongoing PDU Session Resource Setup procedure and initiate the Handover Preparation procedure as follows:

- The NG-RAN node shall send the PDU SESSION RESOURCE SETUP RESPONSE message in which the NG-RAN node shall indicate, if necessary, all the PDU session resources which failed to be setup with an appropriate cause value, e.g. "NG intra-system handover triggered", "NG inter-system handover triggered" or "Xn handover triggered".
- 2. The NG-RAN node shall trigger the handover procedure.

8.2.1.3 Unsuccessful Operation

The unsuccessful operation is specified in the successful operation section.

8.2.1.4 Abnormal Conditions

If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing several *PDU Session ID* IEs (in the *PDU Session Resource Setup Request List* IE) set to the same value, the NG-RAN node shall report the establishment of the corresponding PDU sessions as failed in the PDU SESSION RESOURCE SETUP RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing a *PDU Session ID* IE (in the *PDU Session Resource Setup Request List* IE) set to a value that identifies an active PDU session (established before the PDU SESSION RESOURCE SETUP REQUEST message was received), the NG-RAN node shall report the establishment of the new PDU session as failed in the PDU SESSION RESOURCE SETUP RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing a *QoS Flow Setup Request List* IE in the *PDU Session Resource Setup Request Transfer* IE including at least one Non-GBR QoS flow but the *PDU Session Aggregate Maximum Bit Rate* IE is not present, the NG-RAN node shall report the establishment of the corresponding PDU session as failed in the PDU SESSION RESOURCE SETUP REQUEST message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing a QoS Flow Level QoS Parameters IE in the PDU Session Resource Setup Request Transfer IE for a GBR QoS flow but the GBR QoS Flow Information IE is not present, the NG-RAN node shall report the establishment of the corresponding QoS flow as failed in the PDU Session Resource Setup Response Transfer IE of the PDU SESSION RESOURCE SETUP RESPONSE message with an appropriate cause value. If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing the Delay Critical IE in the Dynamic 5QI Descriptor IE of the QoS Flow Level QoS Parameters IE of the PDU Session Resource Setup Request Transfer IE set to the value "delay critical" but the Maximum Data Burst Volume IE is not present, the NG-RAN node shall report the establishment of the corresponding QoS flow as failed in the PDU Session Resource Setup Response Transfer IE of the PDU SESSION RESOURCE SETUP RESPONSE message with an appropriate cause value.

8.2.2 PDU Session Resource Release

8.2.2.1 General

The purpose of the PDU Session Resource Release procedure is to enable the release of already established PDU session resources for a given UE. The procedure uses UE-associated signalling.

8.2.2.2 Successful Operation



Figure 8.2.2.2-1: PDU session resource release: successful operation

The AMF initiates the procedure by sending a PDU SESSION RESOURCE RELEASE COMMAND message.

The PDU SESSION RESOURCE RELEASE COMMAND message shall contain the information required by the NG-RAN node to release at least one PDU session resource, and include each PDU session resource to release in the PDU Session Resource to Release List IE.

If a NAS-PDU IE is contained in the PDU SESSION RESOURCE RELEASE COMMAND message, the NG-RAN node shall pass it to the UE.

Upon reception of the PDU SESSION RESOURCE RELEASE COMMAND message the NG-RAN node shall execute the release of the requested PDU sessions. For each PDU session to be released the NG-RAN node shall release the corresponding resources over Uu and over NG, if any.

If the *RAN Paging Priority* IE is included in the PDU SESSION RESOURCE RELEASE COMMAND message, the NG-RAN node may use it to determine a priority for paging the UE in RRC_INACTIVE state.

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE RELEASE RESPONSE message location information of the UE in the *User Location Information* IE.

After sending a PDU SESSION RESOURCE RELEASE RESPONSE message, the NG-RAN node shall be prepared to receive a PDU SESSION RESOURCE SETUP REQUEST message requesting establishment of a PDU session with a PDU Session ID corresponding to one of the PDU Session IDs that was present in the *PDU Session Resource to Release List* IE of the PDU SESSION RESOURCE RELEASE COMMAND message.

If the *User Location Information* IE is included in the PDU SESSION RESOURCE RELEASE RESPONSE message, the AMF shall handle this information as specified in TS 23.501 [9].

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Release Response Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

8.2.2.3 Unsuccessful Operation

The unsuccessful operation is specified in the successful operation section.

8.2.2.4 Abnormal Conditions

If the NG-RAN node receives a PDU SESSION RESOURCE RELEASE COMMAND message containing multiple *PDU Session ID* IEs (in the *PDU Session Resource to Release List* IE) set to the same value, the NG-RAN node shall initiate the release of one corresponding PDU session and ignore the duplication of the instances of the selected corresponding PDU sessions.

8.2.3 PDU Session Resource Modify

8.2.3.1 General

The purpose of the PDU Session Resource Modify procedure is to enable configuration modifications of already established PDU session(s) for a given UE. It is also to enable the setup, modification and release of the QoS flow for already established PDU session(s). The procedure uses UE-associated signalling.

8.2.3.2 Successful Operation

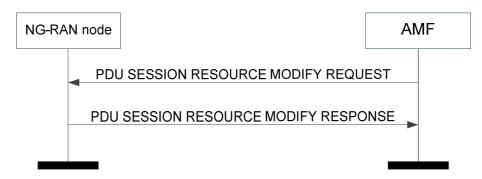


Figure 8.2.3.2-1: PDU session resource modify: successful operation

The AMF initiates the procedure by sending a PDU SESSION RESOURCE MODIFY REQUEST message to the NG-RAN node.

The PDU SESSION RESOURCE MODIFY REQUEST message shall contain the information required by the NG-RAN node, which may trigger the NG-RAN configuration modification for the existing PDU sessions listed in the *PDU Session Resource Modify Request List* IE.

Upon reception of the PDU SESSION RESOURCE MODIFY REQUEST message, if the NG-RAN configuration is triggered to be modified and if resources are available for the modified NG-RAN configuration, the NG-RAN node shall execute the configuration modification for the requested PDU session.

If the *RAN Paging Priority* IE is included in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node may use it to determine a priority for paging the UE in RRC_INACTIVE state.

For each PDU session, if the *S-NSSAI* IE is included in the *PDU Session Resource Modify Request Item* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall replace the previously provided S-NSSAI by the received S-NSSAI for the concerned PDU session and use it as specified in TS 23.502 [10].

For each PDU session, if the *Network Instance* IE is included in the *PDU Session Resource Modify Request Transfer* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message and the *Common Network Instance* IE is not present, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource Modify Request Transfer* IE or in the *Additional UL NG-U UP TNL Information* IE, or in the *Additional Redundant UL NG-U UP TNL Information* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, use it when selecting transport network resource for the concerned NG-U transport bearer as specified in TS 23.501 [9].

For each PDU session, if the *Redundant Common Network Instance* IE is included in the *PDU Session Resource Modify Request Transfer* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, use it for the redundant transmission as specified in TS 23.501 [9].

For each PDU session, if the TSC Traffic Characteristics IE is included in the PDU Session Resource Modify Request Transfer IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, store it and use it as specified in TS 23.501 [9].

For each PDU session, if the *Redundant QoS Flow Indicator* IE is included and set to "false" for all QoS flows, the NG-RAN node shall, if supported, stop the redundant transmission and release the redundant tunnel for the concerned PDU session as specified in TS 23.501 [9].

For each PDU session in the PDU SESSION RESOURCE MODIFY REQUEST message, if the *Alternative QoS Parameters Set List* IE is included in the *GBR QoS Flow Information* IE in the *PDU Session Resource Modify Request Transfer* IE of the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node may accept the setup of the QoS flow when notification control has been enabled if the requested QoS parameters or at least one of the alternative QoS parameters sets can be fulfilled at the time of setup. In case the NG-RAN node accepts the setup fulfilling one of the alternative QoS parameters it shall indicate the alternative QoS parameters set which it currently fulfils in the *Current QoS Parameters Set Index* IE within the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE MODIFY RESPONSE message.

For each PDU session included in the PDU Session Resource Modify Request List IE:

- For each QoS flow included in the *QoS Flow Add or Modify Request List* IE, based on the *QoS Flow Level QoS Parameters* IE, the NG-RAN node may establish, modify or release the DRB configuration and may change allocation of resources on NG or Uu accordingly. The NG-RAN node shall associate each QoS flow accepted to setup or modify which is not associated with an MBS QoS flow with a DRB of the PDU session. The associated DRB for the QoS flow accepted to modify may not change.
- For each QoS flow, if the *Redundant QoS Flow Indicator* IE is included, the NG-RAN node shall, if supported, store it and consider it for the redundant transmission as specified in TS 23.501 [9].
- For each QoS flow included in the QoS Flow Add or Modify Request List IE, if the QoS Flow Add or Modify Request Item IE is included for an existing QoS Flow Identifier IE, the NG-RAN node shall overwrite the content of the full QoS Flow Add or Modify Request Item IE.
- For each QoS flow included in the *QoS Flow to Release List* IE, the NG-RAN node shall de-associate the QoS flow with the previously associated DRB.
- If the NAS-PDU IE is received for the PDU session, the NG-RAN node shall pass it to the UE only if at least one of the requests included in the PDU Session Resource Modify Request Transfer IE is successful (i.e. the PDU session is included in the PDU Session Resource Modify Response Item IE of the PDU SESSION RESOURCE MODIFY RESPONSE message).
- The NG-RAN node may change allocation of resources on NG according to the requested target configuration.
- If the *PDU Session Aggregate Maximum Bit Rate* IE is included in the *PDU Session Resource Modify Request Transfer* IE, the NG-RAN node shall store and use the received PDU Session Aggregate Maximum Bit Rate value when enforcing traffic policing for Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].
- If the *UL NG-U UP TNL Information* IE in the *UL NG-U UP TNL Modify List* IE is included in the *PDU Session Resource Modify Request Transfer* IE, the NG-RAN node shall update the transport layer information for the uplink data accordingly for the concerned transport bearers identified by the *DL NG-U UP TNL Information* IE included in the *PDU Session Resource Modify Request Transfer* IE for the concerned PDU session.
- If the Additional UL NG-U UP TNL Information IE is included in the PDU Session Resource Modify Request Transfer IE, the NG-RAN node may allocate resources for an additional NG-U transport bearer for some or all of the QoS flows present in the QoS Flow Add or Modify Request List IE and it shall indicate these QoS flows in the Additional DL QoS Flow per TNL Information IE in the PDU Session Resource Modify Response Transfer IE. In case the Additional DL QoS Flow per TNL Information IE is not included the SMF shall consider the proposed additional UL NG-U UP TNL information as available again.
- In case more than one NG-U transport bearers have been set up for the PDU session, if all the QoS flows associated to one existing NG-U transport bearer are included in the *QoS Flow to Release List* IE in the *PDU Session Resource Modify Request Transfer* IE, the NG-RAN node and 5GC shall consider that the concerned NG-U transport bearer is removed for the PDU session, and both NG-RAN node and 5GC shall therefore consider the related NG-U UP TNL information as available again.
- If the *Redundant UL NG-U UP TNL Information* IE within the *UL NG-U UP TNL Modify List* IE is included in the *PDU Session Resource Modify Request Transfer* IE, the NG-RAN node shall, if supported, update the transport layer information for the uplink data accordingly for the concerned transport bearer identified by the *Redundant DL NG-U UP TNL Information* IE included in the *PDU Session Resource Modify Request Transfer* IE for the concerned PDU session.

- If the Additional Redundant UL NG-U UP TNL Information IE is included in the PDU Session Resource Modify Request Transfer IE, the NG-RAN node may allocate resources for an additional redundant NG-U transport bearer for some or all of the QoS flows present in the QoS Flow Add or Modify Request List IE and it shall, if supported, indicate these QoS flows in the Additional Redundant DL QoS Flow per TNL Information IE in the PDU Session Resource Modify Response Transfer IE. In case the Additional Redundant DL QoS Flow per TNL Information IE is not included the SMF shall consider the proposed additional Redundant UL NG-U UP TNL information as available again.
- If the Redundant UL NG-U UP TNL Information IE is included in the PDU Session Resource Modify Request Transfer IE, the NG-RAN node may allocate resources for a redundant NG-U transport bearer for some or all of the QoS flows present in the QoS Flow Add or Modify Request List IE and it shall, if supported, indicate the corresponding NG-RAN endpoint of this NG-U transport bearer in the Redundant DL NG-U UP TNL Information IE in the PDU Session Resource Modify Response Transfer IE.
- If the Security Indication IE is included in the PDU Session Resource Modify Request Transfer IE, the NG-RAN node shall, if supported, only update the maximum integrity protected data rate uplink and/or the maximum integrity protected data rate downlink, and take them into account as defined in the PDU Session Resource Setup procedure.

For each QoS flow which has been successfully added or modified, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

The NG-RAN node shall report to the AMF, in the PDU SESSION RESOURCE MODIFY RESPONSE message, the result for each PDU session requested to be modified listed in the PDU SESSION RESOURCE MODIFY REQUEST message:

- For each PDU session which is successfully modified, the *PDU Session Resource Modify Response Transfer* IE shall be included containing:
 - 1. The list of QoS flows which have been successfully setup or modified, if any, in the *QoS Flow Add or Modify Response List* IE in case the PDU Session Resource Modify procedure is triggered by QoS flow setup or modification.
 - 2. The list of QoS flows which have failed to be setup or modified, if any, in the *QoS Flow Failed to Add or Modify List* IE in case the PDU Session Resource Modify procedure is triggered by QoS flow setup or modification.
- For each PDU session which failed to be modified, the *PDU Session Resource Modify Unsuccessful Transfer* IE shall be included containing the failure cause.
- For each PDU session, if the *DL NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall be considered by the SMF as the new DL transport layer address for the PDU session. The NG-RAN also may indicate the mapping between each new DL transport layer address and the corresponding UL transport layer address assigned by the 5GC.
- For each PDU session, if the *Additional NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall, if supported, be considered by the SMF as the new DL transport layer address(es) for the PDU session. The NG-RAN also may indicate the mapping between each new DL transport layer address and the corresponding UL transport layer address assigned by the 5GC.
- For each PDU session, if the *Additional Redundant NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall, if supported, be considered by the SMF as the new DL transport layer address(es) for the PDU session for the redundant transmission. The NG-RAN also may indicate the mapping between each new redundant DL transport layer address and the corresponding redundant UL transport layer address assigned by the 5GC.

Upon reception of the PDU SESSION RESOURCE MODIFY RESPONSE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Modify Response Transfer* IE or *PDU Session Resource Modify Unsuccessful Transfer* IE to each SMF associated with the concerned PDU session.

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE MODIFY RESPONSE message location information of the UE in the *User Location Information* IE.

For a PDU session or a QoS flow which failed to be modified, the NG-RAN node shall fall back to the configuration of the PDU session or the QoS flow as it was configured prior to the reception of the PDU SESSION RESOURCE MODIFY REQUEST message.

Upon reception of the PDU SESSION RESOURCE MODIFY REQUEST message to setup a QoS flow for IMS voice, if the NG-RAN node is not able to support IMS voice, the NG-RAN node shall initiate EPS fallback or RAT fallback for IMS voice procedure as specified in TS 23.501 [9] and report unsuccessful establishment of the QoS flow in the *PDU Session Resource Modify Response Transfer* IE or in the *PDU Session Resource Modify Unsuccessful Transfer* IE with cause value "IMS voice EPS fallback or RAT fallback triggered".

If the *User Location Information* IE is included in the PDU SESSION RESOURCE MODIFY RESPONSE message, the AMF shall handle this information as specified in TS 23.501 [9].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

Interactions with Handover Preparation procedure:

If a handover becomes necessary during the PDU Session Resource Modify procedure, the NG-RAN node may interrupt the ongoing PDU Session Resource Modify procedure and initiate the Handover Preparation procedure as follows:

- 1. The NG-RAN node shall send the PDU SESSION RESOURCE MODIFY RESPONSE message in which the NG-RAN node shall indicate, if necessary, all the PDU sessions failed with an appropriate cause value, e.g. "NG intra-system handover triggered", "NG inter-system handover triggered" or "Xn handover triggered".
- 2. The NG-RAN node shall trigger the handover procedure.

8.2.3.3 Unsuccessful Operation

The unsuccessful operation is specified in the successful operation section.

8.2.3.4 Abnormal Conditions

If the NG-RAN node receives a PDU SESSION RESOURCE MODIFY REQUEST message containing several *PDU Session ID* IEs (in the *PDU Session Resource Modify Request List* IE) set to the same value, the NG-RAN node shall report the modification of the corresponding PDU sessions as failed in the PDU SESSION RESOURCE MODIFY RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE MODIFY REQUEST message containing some *PDU Session ID* IEs (in the *PDU Session Resource Modify Request List* IE) that the NG-RAN node does not recognize, the NG-RAN node shall report the corresponding invalid PDU sessions as failed in the PDU SESSION RESOURCE MODIFY RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE MODIFY REQUEST message containing a *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource Modify Request Transfer* IE for a GBR QoS flow but the *GBR QoS Flow Information* IE is not present, the NG-RAN node shall report the addition or modification of the corresponding QoS flow as failed in the *PDU Session Resource Modify Response Transfer* IE of the PDU SESSION RESOURCE MODIFY RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE MODIFY REQUEST message containing the *Delay Critical* IE in the *Dynamic 5QI Descriptor* IE of the *QoS Flow Level QoS Parameters* IE of the *PDU Session Resource*

Modify Request Transfer IE set to the value "delay critical" but the Maximum Data Burst Volume IE is not present, the NG-RAN node shall report the addition or modification of the corresponding QoS flow as failed in the PDU Session Resource Modify Response Transfer IE of the PDU SESSION RESOURCE MODIFY RESPONSE message with an appropriate cause value.

If the NG-RAN node receives a PDU SESSION RESOURCE MODIFY REQUEST message containing a PDU session in the *PDU Session Resource Modify Request List* IE with the same QoS flow included both in the *QoS Flow Add or Modify Request List* IE and the *QoS Flow to Release List* IE, the NG-RAN node shall report the corresponding QoS flow as failed in the *QoS Flow Failed to Add or Modify List* IE in the *PDU Session Resource Modify Response Transfer* IE of the PDU SESSION RESOURCE MODIFY RESPONSE message with an appropriate cause value if the PDU session is modified successfully. The NG-RAN node shall not release the QoS flow when the corresponding QoS flow already exists.

8.2.4 PDU Session Resource Notify

8.2.4.1 General

The purpose of the PDU Session Resource Notify procedure is to notify that the already established QoS flow(s) or PDU session(s) for a given UE are released or not fulfilled anymore or fulfilled again by the NG-RAN node for which notification control is requested. It is also used to notify that the updated QoS parameters during the Path Switch Request procedure are not successfully accepted by the NG-RAN node. The procedure uses UE-associated signalling.

8.2.4.2 Successful Operation

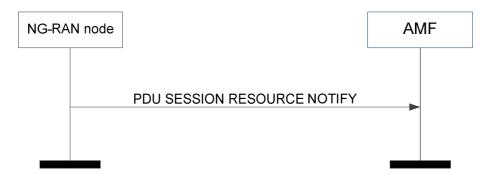


Figure 8.2.4.2-1: PDU session resource notify

The NG-RAN node initiates the procedure by sending a PDU SESSION RESOURCE NOTIFY message.

The PDU SESSION RESOURCE NOTIFY message shall contain the information of PDU session resources or QoS flows which are released or not fulfilled anymore or fulfilled again by the NG-RAN node.

- For each PDU session for which some QoS flows are released or not fulfilled anymore or fulfilled again by the NG-RAN node, the *PDU Session Resource Notify Transfer* IE shall be included containing:
 - 1. The list of QoS flows which are released by the NG-RAN node, if any, in the QoS flow Released List IE.
 - 2. The list of GBR QoS flows which are not fulfilled anymore or fulfilled again by the NG-RAN node, if any, in the *QoS Flow Notify List* IE together with the *Notification Cause* IE. For a QoS flow indicated as not fulfilled anymore the NG-RAN node may also indicate an alternative QoS parameters set which it can currently fulfil in the *Current QoS Parameters Set Index* IE.
 - 3. The list of QoS flows for which the QoS parameters were updated but could not be successfully accepted by the NG-RAN node during the Path Switch Request procedure, if any, in the *QoS Flow Feedback List* IE which may be associated with a value it could offer.
- For each PDU session resource which is released by the NG-RAN node, the *PDU Session Resource Notify Released Transfer* IE shall be included containing the release cause in the *Cause* IE.

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE NOTIFY message location information of the UE in the *User Location Information* IE.

Upon reception of the PDU SESSION RESOURCE NOTIFY message, the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Notify Transfer* IE or *PDU Session Resource Notify Released Transfer* IE to the SMF associated with the concerned PDU session. Upon reception of *PDU Session Resource Notify Transfer* IE, the SMF normally initiate the appropriate release or modify procedure on the core network side for the PDU session(s) or QoS flow(s) identified as not fulfilled anymore.

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Notify Transfer* IE or the *PDU Session Resource Notify Released Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

If the *User Location Information* IE is included in the PDU SESSION RESOURCE NOTIFY message, the AMF shall handle this information as specified in TS 23.501 [9].

8.2.4.3 Abnormal Conditions

Void.

8.2.5 PDU Session Resource Modify Indication

8.2.5.1 General

The purpose of the PDU Session Resource Modify Indication procedure is for the NG-RAN node to request modification of the established PDU session(s). The procedure uses UE-associated signalling.

8.2.5.2 Successful Operation

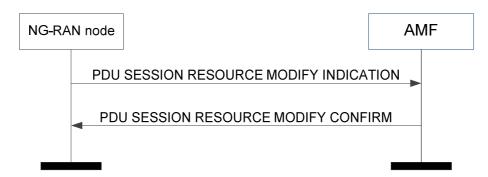


Figure 8.2.5.2-1: PDU session resource modify indication: successful operation

The NG-RAN node initiates the procedure by sending a PDU SESSION RESOURCE MODIFY INDICATION message. Upon reception of the PDU SESSION RESOURCE MODIFY INDICATION message, the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transparently transfer the *PDU Session Resource Modify Indication Transfer* IE to the SMF associated with the concerned PDU session.

For each PDU session for which the *DL QoS Flow per TNL Information* IE is included in the *PDU Session Resource Modify Indication Transfer* IE in the PDU SESSION RESOURCE MODIFY INDICATION message, the SMF shall, if the request is accepted, consider the included DL transport layer address as the DL transport layer address for the included associated QoS flows and provide the associated UL transport layer address in the *UL NG-U UP TNL Information* IE in the *PDU Session Resource Modify Confirm Transfer* IE in the PDU SESSION RESOURCE MODIFY CONFIRM message.

For each PDU session for which the *Additional DL QoS Flow per TNL Information* IE is included in the *PDU Session Resource Modify Indication Transfer* IE in the PDU SESSION RESOURCE MODIFY INDICATION message, the SMF shall, if supported, consider for this split PDU session each included DL transport layer address(es) as the DL transport layer address(s) for the included associated QoS flows and it may provide the associated UL transport layer address(s) in the *Additional NG-U UP TNL Information* IE in the *PDU Session Resource Modify Confirm Transfer* IE in the PDU SESSION RESOURCE MODIFY CONFIRM message.

In case more than one NG-U transport bearers have been set up for the PDU session, the *DL QoS Flow per TNL Information* IE and the *Additional DL QoS Flow per TNL Information* IE in the *PDU Session Resource Modify Indication Transfer* IE in the PDU SESSION RESOURCE MODIFY INDICATION message shall be included if at

least one QoS flow is associated to their respective NG-U transport bearer; if no QoS flow is associated to one existing NG-U transport bearer after the modification, the NG-RAN node and 5GC shall consider that the concerned NG-U transport bearer is removed for the PDU session, and both NG-RAN node and 5GC shall therefore consider the related NG-U UP TNL information as available again.

For each PDU session for which the *Redundant DL QoS Flow per TNL Information* IE is included in the *PDU Session Resource Modify Indication Transfer* IE in the PDU SESSION RESOURCE MODIFY INDICATION message, the SMF shall, if supported, consider the included DL transport layer address as the new DL transport layer address for the included associated QoS flows for redundant transmission and it may provide the associated UL transport layer address in the *Redundant UL NG-U UP TNL Information* IE in the *PDU Session Resource Modify Confirm Transfer* IE in the PDU SESSION RESOURCE MODIFY CONFIRM message.

For each PDU session for which the *Additional Redundant DL QoS Flow per TNL Information* IE is included in the *PDU Session Resource Modify Indication Transfer* IE in the PDU SESSION RESOURCE MODIFY INDICATION message, the SMF shall, if supported, consider for this split PDU session each included DL transport layer address(es) as the new downlink termination point(s) for the included associated QoS flows and it may provide the associated UL transport layer address(s) in the *Additional Redundant NG-U UP TNL Information* IE in the *PDU Session Resource Modify Confirm Transfer* IE in the PDU SESSION RESOURCE MODIFY CONFIRM message for the redundant transmission.

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *PDU Session Resource Modify Indication Transfer* IE of the PDU SESSION RESOURCE MODIFY INDICATION message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

If the Security Result IE is included in the PDU Session Resource Modify Indication Transfer IE in the PDU SESSION RESOURCE MODIFY INDICATION message, it shall be considered by the SMF as the new security status of the PDU session.

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Modify Indication Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

The AMF shall report to the NG-RAN node in the PDU SESSION MODIFY RESOURCE CONFIRM message the result for each PDU session listed in PDU SESSION RESOURCE MODIFY INDICATION message:

- For each PDU session which is successfully modified, the *PDU Session Resource Modify Confirm Transfer* IE shall be included containing:
 - 1. The list of QoS flows which have been successfully modified in the QoS Flow Modify Confirm List IE.
 - 2. The list of QoS flows which have failed to be modified, if any, in the QoS flow Failed to Modify List IE.
- For each PDU session which failed to be modified, the *PDU Session Resource Modify Indication Unsuccessful Transfer* IE shall be included to report the failure cause.

Upon reception of the *PDU Session Resource Modify Confirm Transfer* IE for each PDU session listed in the PDU SESSION RESOURCE MODIFY CONFIRM message:

- If the QoS Flow Failed To Modify List IE is included, the NG-RAN node shall either
 - 1. de-associate the corresponding DRB for the concerned QoS flow, or
 - 2. keep the previous transport layer information before sending the PDU SESSION RESOURCE MODIFY INDICATION unchanged for the concerned QoS flow.

Upon reception of the *PDU Session Resource Modify Indication Unsuccessful Transfer* IE for each PDU session listed in the PDU SESSION RESOURCE MODIFY CONFIRM message, the NG-RAN node shall either:

- 1. release all corresponding NG-RAN configuration and resources for the concerned PDU session, or
- 2. keep the previous transport layer information before sending the PDU SESSION RESOURCE MODIFY INDICATION unchanged for the concerned PDU session.

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE MODIFY INDICATION message location information of the UE in the *User Location Information* IE.

8.2.5.3 Unsuccessful Operation

The unsuccessful operation is specified in the successful operation section.

8.2.5.4 Abnormal Conditions

Void.

8.3 UE Context Management Procedures

8.3.1 Initial Context Setup

8.3.1.1 General

The purpose of the Initial Context Setup procedure is to establish the necessary overall initial UE context at the NG-RAN node, when required, including PDU session context, the Security Key, Mobility Restriction List, UE Radio Capability and UE Security Capabilities, etc. The AMF may initiate the Initial Context Setup procedure if a UE-associated logical NG-connection exists for the UE or if the AMF has received the *RAN UE NGAP ID* IE in an INITIAL UE MESSAGE message or if the NG-RAN node has already initiated a UE-associated logical NG-connection by sending an INITIAL UE MESSAGE message via another NG interface instance. The procedure uses UE-associated signalling.

For signalling only connections and if the *UE Context Request* IE is not received in the Initial UE Message, the AMF may be configured to trigger the procedure for all NAS procedures or on a per NAS procedure basis depending on operator's configuration.

8.3.1.2 Successful Operation

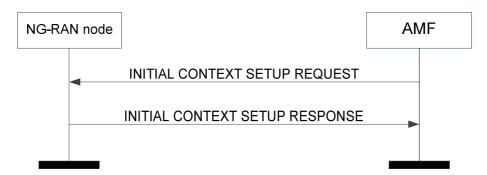


Figure 8.3.1.2-1: Initial context setup: successful operation

In case of the establishment of a PDU session the 5GC shall be prepared to receive user data before the INITIAL CONTEXT SETUP RESPONSE message has been received by the AMF. If no UE-associated logical NG-connection exists, the UE-associated logical NG-connection shall be established at reception of the INITIAL CONTEXT SETUP REQUEST message.

The INITIAL CONTEXT SETUP REQUEST message shall contain the *Index to RAT/Frequency Selection Priority* IE, if available in the AMF.

If the NAS-PDU IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall pass it transparently towards the UE.

If the *Masked IMEISV* IE is contained in the INITIAL CONTEXT SETUP REQUEST message the target NG-RAN node shall, if supported, use it to determine the characteristics of the UE for subsequent handling.

Upon receipt of the INITIAL CONTEXT SETUP REQUEST message the NG-RAN node shall

- attempt to execute the requested PDU session configuration;

- store the received UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9];
- store the received Mobility Restriction List in the UE context;
- store the received UE Radio Capability in the UE context;
- store the received Index to RAT/Frequency Selection Priority in the UE context and use it as defined in TS 23.501 [9];
- store the received UE Security Capabilities in the UE context;
- store the received Security Key in the UE context and, if the NG-RAN node is required to activate security for the UE, take this security key into use;
- if supported, store the received SRVCC Operation Possible in the UE context and use it as defined in TS 23.216 [31];
- store the received NR V2X Services Authorization information, if supported, in the UE context;
- store the received LTE V2X Services Authorization information, if supported, in the UE context;
- store the received NR UE Sidelink Aggregate Maximum Bit Rate, if supported, in the UE context, and use it for the concerned UE's sidelink communication in network scheduled mode for NR V2X services;
- store the received LTE UE Sidelink Aggregate Maximum Bit Rate, if supported, in the UE context, and use it for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services;
- store the received PC5 QoS Parameters, if supported, in the UE context and use it as defined in TS 23.287 [33];
- store the received Management Based MDT PLMN List information, if supported, in the UE context;
- if supported, store the received IAB Authorization information in the UE context;
- store the received 5G ProSe Authorization information in the UE context, if supported, and use it for the concerned UE's sidelink communication in network scheduled mode for 5G ProSe services:
- store the 5G ProSe UE PC5 Aggregate Maximum Bit Rate in the UE context, if supported, and use it for the concerned UE's sidelink communication in network scheduled mode for 5G ProSe services;
- store the 5G ProSe PC5 QoS Parameters, if supported, in the UE context and use it as defined in TS 23.304 [47].

For the Initial Context Setup an initial value for the Next Hop Chaining Count is stored in the UE context.

If the *PDU Session Resource Setup Request List* IE is contained in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall behave the same as defined in the PDU Session Resource Setup procedure. The NG-RAN node shall report to the AMF in the INITIAL CONTEXT SETUP RESPONSE message the result for each PDU session resource requested to be setup as defined in the PDU Session Resource Setup procedure.

Upon reception of the INITIAL CONTEXT SETUP RESPONSE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Setup Response Transfer* IE or *PDU Session Resource Setup Unsuccessful Transfer* IE to the SMF associated with the concerned PDU session. In case the splitting PDU session is not used by the NG-RAN node, the SMF should remove the Additional Transport Layer Information, if any.

The NG-RAN node shall use the information in the *Mobility Restriction List* IE if present in the INITIAL CONTEXT SETUP REQUEST message to

- determine a target for subsequent mobility action for which the NG-RAN node provides information about the target of the mobility action towards the UE;
- select a proper SCG during dual connectivity operation;
- assign proper RNA(s) for the UE when moving the UE to RRC INACTIVE state.

If the *Mobility Restriction List* IE is not contained in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall consider that no roaming and no access restriction apply to the UE. The NG-RAN node shall also consider that no roaming and no access restriction apply to the UE when:

- one of the QoS flows includes a particular ARP value (TS 23.501 [9]).

If the *Trace Activation* IE is included in the INITIAL CONTEXT SETUP REQUEST message the NG-RAN node shall, if supported, initiate the requested trace function as described in TS 32.422 [11]. In particular, the NG-RAN node shall, if supported:

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT and Trace", initiate the requested trace session and MDT session as described in TS 32.422 [11];
- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT Only", "Logged MDT only", initiate the requested MDT session as described in TS 32.422 [11] and the NG-RAN node shall ignore the *Interfaces To Trace* IE and the *Trace Depth* IE;
- if the *Trace Activation* IE includes the *MDT Location Information* IE within the *MDT Configuration* IE, store this information and take it into account in the requested MDT session;
- if the *Trace Activation* IE includes the *Signalling Based MDT PLMN List* IE within the *MDT Configuration* IE, the NG-RAN node may use it to propagate the MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *Bluetooth Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *WLAN Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *Sensor Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *MDT Configuration* IE and if the NG-RAN node is a gNB at least the *MDT Configuration-NR* IE shall be present, while if the NG-RAN node is an ng-eNB at least the *MDT Configuration-EUTRA* IE shall be present.

If the *UE Security Capabilities* IE included in the INITIAL CONTEXT SETUP REQUEST message only contains the EIA0 or NIA0 algorithm as defined in TS 33.501 [13] and if the EIA0 or NIA0 algorithm is defined in the configured list of allowed integrity protection algorithms in the NG-RAN node (TS 33.501 [13]), the NG-RAN node shall take it into use and ignore the keys received in the *Security Key* IE.

If the *QMC Configuration Information* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, use it for QoE management, as described in TS 38.300 [8].

If the *Core Network Assistance Information for RRC INACTIVE* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context and use it for the RRC_INACTIVE state decision and RNA configuration for the UE and RAN paging if any for a UE in RRC_INACTIVE state, as specified in TS 38.300 [8]. If the *MICO All PLMN* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE the NG-RAN node shall, if supported, consider that the registration area for the UE is the full PLMN and ignore the *TAI List for RRC Inactive* IE. If the *Paging Cause Indication for Voice Service* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store and use it as specified in 38.300 [8]. If the *PEIPS Assistance Information* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store it and use it for paging subgrouping the UE in RRC_INACTIVE state, as specified in TS 38.300 [8].

If the CN Assisted RAN Parameters Tuning IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node may use it as described in TS 23.501 [9].

If the *RRC Inactive Transition Report Request* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context.

If the *Emergency Fallback Indicator* IE is included in the INITIAL CONTEXT SETUP REQUEST message, it indicates that the UE context to be set up is subject to emergency service fallback as described in TS 23.501 [9] and the NG-RAN node may, if supported, take the appropriate mobility actions.

If the *Old AMF* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall consider that this UE-associated logical NG-connection was redirected to this AMF from another AMF identified by the *Old AMF* IE.

If the *Redirection for Voice EPS Fallback* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store it and use it in a subsequent decision of EPS fallback for voice as specified in TS 23.502 [10].

If the *Location Reporting Request Type* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node should perform the requested location reporting functionality for the UE as described in subclause 8.12.

If the *Enhanced Coverage Restriction* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *Extended Connected Time* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

If the *CE-mode-B Restricted* IE is included in the INITIAL CONTEXT SETUP REQUEST message and the *Enhanced Coverage Restriction* IE is not set to "restricted" and the Enhanced Coverage Restriction information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE User Plane CIoT Support Indicator* IE is included in the INITIAL CONTEXT SETUP REQUEST message the NG-RAN node shall, if supported, store this information in the UE context and consider that User Plane CIoT 5GS Optimisation as specified in TS 23.501 [9] is supported for the UE.

If the *Management Based MDT PLMN List* IE is contained in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, use it to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [11].

If the INITIAL CONTEXT SETUP REQUEST message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the INTIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

If the *Time Synchronisation Assistance Information* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store the information in the UE context and use it as defined in TS 23.501 [9].

If the *Target NSSAI Information* IE is contained in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node may use this information as specified in TS 23.501 [9].

If the *UE Slice Maximum Bit Rate List* IE is included in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall, if supported, store the received UE Slice Maximum Bit Rate List in the UE context, and use it for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

Interactions with Initial UE Message procedure:

The NG-RAN node shall use the AMF UE NGAP ID IE and RAN UE NGAP ID IE received in the INITIAL CONTEXT SETUP REQUEST message as identification of the logical connection even if the RAN UE NGAP ID IE had been allocated in an INITIAL UE MESSAGE message sent over a different NG interface instance.

Interactions with RRC Inactive Transition Report procedure:

If the RRC Inactive Transition Report Request IE is included in the INITIAL CONTEXT SETUP REQUEST message and set to "subsequent state transition report", the NG-RAN node shall, if supported, send the RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE when the UE enters or leaves RRC_INACTIVE state.

8.3.1.3 Unsuccessful Operation

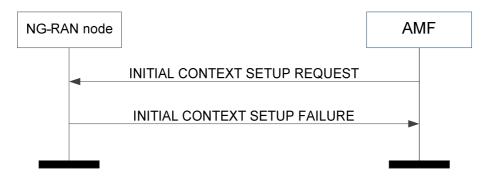


Figure 8.3.1.3-1: Initial context setup: unsuccessful operation

If the NG-RAN node is not able to establish an NG UE context, it shall consider the procedure as failed and reply with the INITIAL CONTEXT SETUP FAILURE message.

If the *PDU Session Resource Setup Request List* IE is contained in the INITIAL CONTEXT SETUP REQUEST message, the NG-RAN node shall report to the AMF, in the INITIAL CONTEXT SETUP FAILURE message, the unsuccessful establishment result for each PDU session resource requested to be setup as defined in the PDU Session Resource Setup procedure.

Upon reception of the INITIAL CONTEXT SETUP FAILURE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Setup Unsuccessful Transfer* IE to the SMF associated with the concerned PDU session and may consider that the NAS PDU included in the INITIAL CONTEXT SETUP REQUEST message was not delivered.

8.3.1.4 Abnormal Conditions

If the supported algorithms for encryption defined in the *Encryption Algorithms* IE in the *UE Security Capabilities* IE, plus the mandated support of EEA0 and NEA0 in all UEs (TS 33.501 [13]), do not match any allowed algorithms defined in the configured list of allowed encryption algorithms in the NG-RAN node (TS 33.501 [13]), the NG-RAN node shall reject the procedure using the INITIAL CONTEXT SETUP FAILURE message.

If the supported algorithms for integrity defined in the *Integrity Protection Algorithms* IE in the *UE Security Capabilities* IE, plus the mandated support of the EIAO and NIAO algorithm in all UEs (TS 33.501 [13]), do not match any allowed algorithms defined in the configured list of allowed integrity protection algorithms in the NG-RAN node (TS 33.501 [13]), the NG-RAN node shall reject the procedure using the INITIAL CONTEXT SETUP FAILURE message.

8.3.2 UE Context Release Request (NG-RAN node initiated)

8.3.2.1 General

The purpose of the UE Context Release Request procedure is to enable the NG-RAN node to request the AMF to release the UE-associated logical NG-connection due to NG-RAN node generated reasons. The procedure uses UE-associated signalling.

8.3.2.2 Successful Operation



Figure 8.3.2.2-1: UE context release request

The NG-RAN node controlling a UE-associated logical NG-connection initiates the procedure by sending a UE CONTEXT RELEASE REQUEST message towards the affected AMF.

The UE CONTEXT RELEASE REQUEST message shall indicate the appropriate cause value, e.g., "TXn_{RELOCOverall} Expiry", "Redirection", for the requested UE-associated logical NG-connection release.

If the *PDU Session Resource List* IE is included in the UE CONTEXT RELEASE REQUEST message, the AMF shall handle this information as specified in TS 23.502 [10].

Interactions with UE Context Release procedure:

The UE Context Release procedure should be initiated upon reception of a UE CONTEXT RELEASE REQUEST message. If the UE was configured with DC radio resources at the time UE Context Release Request procedure was triggered, and the PSCell information was available, the NG-RAN node shall store the PSCell information in the UE context.

8.3.2.3 Abnormal Conditions

Void.

8.3.3 UE Context Release (AMF initiated)

8.3.3.1 General

The purpose of the UE Context Release procedure is to enable the AMF to order the release of the UE-associated logical NG-connection due to various reasons, e.g., completion of a transaction between the UE and the 5GC, or release of the old UE-associated logical NG-connection when the UE has initiated the establishment of a new UE-associated logical NG-connection, etc. The procedure uses UE-associated signalling.

8.3.3.2 Successful Operation



Figure 8.3.3.2-1: UE context release: successful operation

The AMF initiates the procedure by sending the UE CONTEXT RELEASE COMMAND message to the NG-RAN node.

The UE CONTEXT RELEASE COMMAND message shall contain both the AMF UE NGAP ID IE and the RAN UE NGAP ID IE if available, otherwise the message shall contain the AMF UE NGAP ID IE.

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

If the *PDU Session Resource List* IE is included in the UE CONTEXT RELEASE COMPLETE message, the AMF shall handle this information as specified in TS 23.502 [10].

If the *User Location Information* IE is included in the UE CONTEXT RELEASE COMPLETE message, the AMF shall handle this information as specified in TS 23.502 [10].

If the *Information on Recommended Cells and RAN Nodes for Paging* IE is included in the UE CONTEXT RELEASE COMPLETE message, the AMF shall, if supported, store it and may use it for subsequent paging.

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Release Response Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

If the *Paging Assistance Data for CE Capable UE* IE is included in the UE CONTEXT RELEASE COMPLETE message, the AMF shall, if supported, store it and use it for subsequent paging, as specified in TS 23.502 [10].

8.3.3.3 Unsuccessful Operation

Not applicable.

8.3.3.4 Abnormal Conditions

If the UE Context Release procedure is not initiated towards the NG-RAN node before the expiry of the timer TNG_{RELOCOverall}, the NG-RAN node shall request the AMF to release the UE context.

If the UE returns to the NG-RAN node before the reception of the UE CONTEXT RELEASE COMMAND message or the expiry of the timer TNG_{RELOCOverall}, the NG-RAN node shall stop the timer TNG_{RELOCOverall} and continue to serve the UE.

8.3.4 UE Context Modification

8.3.4.1 General

The purpose of the UE Context Modification procedure is to partly modify the established UE context. The procedure uses UE-associated signalling.

8.3.4.2 Successful Operation

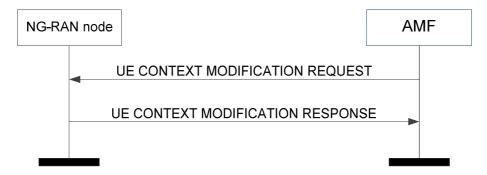


Figure 8.3.4.2-1: UE context modification: successful operation

Upon receipt of the UE CONTEXT MODIFICATION REQUEST message the NG-RAN node shall

- if supported, store the received IAB Authorization information in the UE context.

If the *Security Key* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall store it and perform AS key re-keying according to TS 33.501 [13].

If the *UE Security Capabilities* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall store them and take them into use together with the received keys according to TS 33.501 [13].

If the *Index to RAT/Frequency Selection Priority* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, use it as defined in TS 23.501 [9].

If the RAN Paging Priority IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node may use it to determine a priority for paging the UE in RRC INACTIVE state.

If the *UE Aggregate Maximum Bit Rate* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall

- replace the previously provided UE Aggregate Maximum Bit Rate by the received UE Aggregate Maximum Bit Rate in the UE context;
- use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].

If the *Core Network Assistance Information for RRC INACTIVE* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, replace the previously provided Core Network Assistance Information for RRC INACTIVE and use it for the RRC_INACTIVE state decision and RNA configuration for the UE and RAN paging if any for a UE in RRC_INACTIVE state, as specified in TS 38.300 [8]. If the *MICO All PLMN* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE the NG-RAN node shall, if supported, consider that the registration area for the UE is the full PLMN and ignore the *TAI List for RRC Inactive* IE. If the *Paging Cause Indication for Voice Service* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store and use it as specified in TS 38.300 [8]. If the *PEIPS Assistance Information* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store it and use it for paging subgrouping the UE in RRC_INACTIVE state, as specified in TS 38.300 [8].

If the CN Assisted RAN Parameters Tuning IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node may use it as described in TS 23.501 [9].

If the *RRC Inactive Transition Report Request* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context and report to the AMF the *User Location Information* IE and the *RRC State* IE in the UE CONTEXT MODIFICATION RESPONSE message.

If the *RRC Inactive Transition Report Request* IE is included in the UE CONTEXT MODIFICATION REQUEST message and set to "cancel report", the NG-RAN node shall, if supported, stop reporting to the AMF the RRC state of the UE.

The NG-RAN node shall report, in the UE CONTEXT MODIFICATION RESPONSE message to the AMF, the successful update of the UE context.

If the *Emergency Fallback Indicator* IE is included in the UE CONTEXT MODIFICATION REQUEST message, it indicates that the concerned UE context is subject to emergency service fallback as described in TS 23.501 [9] and the NG-RAN node may, if supported, take the appropriate mobility actions taking into account the *Emergency Service Target CN* IE if provided.

If the *New AMF UE NGAP ID* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall use the received value for future signalling with the AMF.

If the *New GUAMI* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall replace the previously stored GUAMI as specified in TS 23.501 [9].

If the *SRVCC Operation Possible* IE is included in UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, store the content of the received *SRVCC Operation Possible* IE in the UE context and use it as defined in TS 23.216 [31].

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

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

If the NR UE Sidelink Aggregate Maximum Bit Rate IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported:

- replace the previously provided NR UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;
- use the received value for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

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

- replace the previously provided LTE UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value:
- use the received value for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services.

If the *PC5 QoS Parameters* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, use it as defined in TS 23.287 [33].

If the UE CONTEXT MODIFICATION REQUEST message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

If the *Time Synchronisation Assistance Information* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, store the information in the UE context and use it as defined in TS 23.501 [9].

If the *QMC Configuration Information* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, use it for QoE management, as described in TS 38.300 [8].

If the *QMC Deactivation* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, deactivate the QMC configurations therein.

If the *UE Slice Maximum Bit Rate List* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported:

- store and replace the previously provided UE Slice Maximum Bit Rate List, if any, by the received UE Slice Maximum Bit Rate List in the UE context;
- use the received UE Slice Maximum Bit Rate List for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

If the *Management Based MDT PLMN Modification List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node 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 [11].

If the 5G ProSe Authorized IE is included in UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, update the 5G ProSe authorization information for the UE accordingly. If the 5G ProSe Authorized IE includes one or more IEs set to "not authorized", the NG-RAN node shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant 5G ProSe service(s).

If the 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported:

- replace the previously provided 5G ProSe UE PC5 Aggregate Maximum Bit Rate, if available in the UE context, with the received value:
- use the received value for the concerned UE's sidelink communication in network scheduled mode for 5G ProSe services.

If the 5G ProSe PC5 QoS Parameters IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node shall, if supported, use it as defined in TS 23.304 [47].

Interactions with RRC Inactive Transition Report procedure:

If the *RRC Inactive Transition Report Request* IE is included in the UE CONTEXT MODIFICATION REQUEST message and set to "single RRC connected state report", the NG-RAN node shall, if supported and if the UE is in RRC_INACTIVE state, send one subsequent RRC INACTIVE TRANSITION REPORT message to the AMF when the RRC state transitions to RRC CONNECTED state.

If the *RRC Inactive Transition Report Request* IE is included in the UE CONTEXT MODIFICATION REQUEST message and set to "subsequent state transition report", the NG-RAN node shall, if supported, send the RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE when the UE enters or leaves RRC INACTIVE state.

8.3.4.3 Unsuccessful Operation



Figure 8.3.4.3-1: UE context modification: unsuccessful operation

In case the UE context update cannot be performed successfully, the NG-RAN node shall respond with the UE CONTEXT MODIFICATION FAILURE message to the AMF with an appropriate cause value in the *Cause* IE.

If the *New AMF UE NGAP ID* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the NGRAN node may use the received *New AMF UE NGAP ID* IE or *Old AMF UE NGAP ID* IE in the UE CONTEXT MODIFICATION FAILURE message.

8.3.4.4 Abnormal Conditions

If the UE CONTEXT MODIFICATION REQUEST message including the *New AMF UE NGAP ID* IE is received after the NG-RAN node has initiated another class 1 NGAP EP, the NG-RAN node shall be prepared to receive the response message containing an AMF UE NGAP ID with the value received in the *New AMF UE NGAP ID* IE.

NOTE: If the *Emergency Fallback Indicator* IE and the *Security Key* IE are both included in the UE CONTEXT MODIFICATION REQUEST message, the NG-RAN node may handle only the *Emergency Fallback Indicator* IE.

8.3.5 RRC Inactive Transition Report

8.3.5.1 General

The purpose of the RRC Inactive Transition Report procedure is to notify the AMF when the UE enters or leaves RRC_INACTIVE state. The procedure uses UE-associated signalling.

8.3.5.2 Successful Operation



Figure 8.3.5.2-1: RRC Inactive transition report

The NG-RAN node initiates the procedure by sending an RRC INACTIVE TRANSITION REPORT message to the AMF. Upon reception of the RRC INACTIVE TRANSITION REPORT message, the AMF shall take appropriate actions based on the information indicated by the *RRC State* IE.

8.3.5.3 Abnormal Conditions

Void.

8.3.6 Connection Establishment Indication

8.3.6.1 General

The purpose of the Connection Establishment Indication procedure is to enable the AMF to complete the establishment of the UE-associated logical NG-connection. The procedure uses UE-associated signalling. This procedure applies only if the NG-RAN node is an ng-eNB.

8.3.6.2 Successful Operation



Figure 8.3.6.2-1: Connection Establishment Indication procedure. Successful operation.

The AMF initiates the procedure by sending a CONNECTION ESTABLISHMENT INDICATION message to the NG-RAN node.

If the UE-associated logical NG-connection is not established, the AMF shall allocate a unique AMF UE NGAP ID to be used for the UE and include it in the CONNECTION ESTABLISHMENT INDICATION message.

If the *UE Radio Capability* IE is included in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall store this information in the UE context, and use it as defined in TS 38.300 [8].

If the *End Indication* IE is included in the CONNECTION ESTABLISHMENT INDICATION message and set to "no further data", the NG-RAN node shall consider that there are no further NAS PDUs to be transmitted for this UE.

If the *S-NSSAI* IE is contained in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *Allowed NSSAI* IE is contained in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

If the *DL CP Security Information* IE is included in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall forward this information to the UE as described in TS 36.300 [17].

If the *NB-IoT UE Priority* IE is contained in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall, if supported, store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *Enhanced Coverage Restriction* IE is included in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *CE-mode-B Restricted* IE is included in the CONNECTION ESTABLISHMENT INDICATION message and the *Enhanced Coverage Restriction* IE is not set to "restricted" and the Enhanced Coverage Restricted information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE Radio Capability ID* IE is contained in the CONNECTION ESTABLISHMENT INDICATION message, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

8.3.6.3 Abnormal Conditions

Void.

8.3.7 AMF CP Relocation Indication

8.3.7.1 General

The purpose of the AMF CP Relocation Indication procedure is to inform the NG-RAN node that the UE's connection is to be relocated to another NG-RAN node as described in TS 38.300 [8], for a UE using Control Plane CIoT 5GS Optimisation. This procedure applies only if the NG-RAN node is an ng-eNB.

The procedure uses UE-associated signalling.

8.3.7.2 Successful Operation

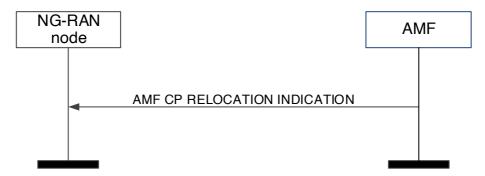


Figure 8.3.7.2-1: AMF CP Relocation Indication. Successful operation.

The AMF initiates the procedure by sending an AMF CP RELOCATION INDICATION message to the NG-RAN node.

Upon reception of the AMF CP RELOCATION INDICATION message, the NG-RAN node shall terminate the delivery of NAS messages that have been received from the AMF.

If the *S-NSSAI* IE is contained in the AMF CP RELOCATION INDICATION message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *Allowed NSSAI* IE is contained in the AMF CP RELOCATION INDICATION message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

Interactions with NAS Non Delivery Indication procedure:

On reception of the AMF CP RELOCATION INDICATION message, the NG-RAN node may initiate NAS Non Delivery Indication procedure(s) to report the non-delivery of any NAS PDUs previously received from the AMF.

8.3.7.3 Abnormal Conditions

Void.

8.3.8 RAN CP Relocation Indication

8.3.8.1 General

The purpose of the RAN CP Relocation Indication procedure is to request the AMF to authenticate the UE's reestablishment request, and trigger the establishment of the respective UE-associated logical NG-connection, for a NB-IoT UE using Control Plane CIoT 5GS Optimisation. This procedure applies only if the NG-RAN node is an ng-eNB.

The procedure uses UE-associated signalling.

8.3.8.2 Successful Operation

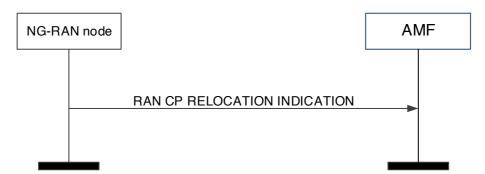


Figure 8.3.8.2-1: RAN CP Relocation Indication.

The NG-RAN node initiates the procedure by sending a RAN CP RELOCATION INDICATION message to the AMF.

The NG-RAN node shall allocate a unique RAN UE NGAP ID to be used for the UE and the NG-RAN node shall include this identity in the RAN CP RELOCATION INDICATION message.

Upon receiving the RAN CP RELOCATION INDICATION message, the AMF shall authenticate the request using the NAS-level security information received in the *UL CP Security Information* IE and if the authentication is successful initiate the Connection Establishment Indication procedure including NAS-level security information in the *DL CP Security Information* IE.

In case the AMF cannot authenticate the UE's request, the CONNECTION ESTABLISHMENT INDICATION message does not contain security information, and the NG-RAN node shall fail the RRC Re-establishment.

In case of authentication failure, the NG-RAN node and the AMF should locally release the allocated NG resources, if any.

Interactions with the AMF CP Relocation and UE Context Release procedures:

In case of successful UE authentication, the AMF initiates the UE Context Release procedure to release the UE's NG-connection in the old NG-RAN node. The AMF may initiate the AMF CP Relocation procedure before the release procedure in order to trigger the old NG-RAN node to return non-delivered NAS PDUs to the AMF.

8.3.8.3 Abnormal Conditions

Void.

8.3.9 Retrieve UE Information

8.3.9.1 General

The purpose of the Retrieve UE Information procedure is for the NG-RAN node to request the UE information including NB-IoT UE Priority and UE Radio Capability from the AMF, for a NB-IoT UE using Control Plane CIoT 5GS Optimisation. The procedure uses non UE-associated signalling. This procedure applies only if the NG-RAN node is an ng-eNB.

8.3.9.2 Successful Operation



Figure 8.3.9.2-1: Retrieve UE Information

The NG-RAN node initiates the procedure by sending the RETRIEVE UE INFORMATION message to the AMF.

8.3.9.3 Abnormal Conditions

Void.

8.3.10 UE Information Transfer

8.3.10.1 General

The purpose of the UE Information Transfer procedure is for the AMF to send the UE information including NB-IoT UE Priority and UE Radio Capability to the NG-RAN node, for a NB-IoT UE using Control Plane CIoT 5GS Optimisation. The procedure uses non UE-associated signalling. This procedure applies only if the NG-RAN node is an ng-eNB.

8.3.10.2 Successful Operation



Figure 8.3.10.2-1: UE Information Transfer

The AMF initiates the procedure by sending the UE INFORMATION TRANSFER message to the NG-RAN node.

If the *NB-IoT UE Priority* IE is contained in the UE INFORMATION TRANSFER message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *UE Radio Capability* IE is contained in the UE INFORMATION TRANSFER message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *S-NSSAI* IE is contained in the UE INFORMATION TRANSFER message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *Allowed NSSAI* IE is contained in the UE INFORMATION TRANSFER message, the NG-RAN node shall store this information in the UE context, and use it as specified in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the UE INFORMATION TRANSFER message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

8.3.10.3 Abnormal Conditions

Void.

8.3.11 UE Context Suspend

8.3.11.1 General

The purpose of the UE Context Suspend procedure is to suspend the UE-associated logical NG-connection and the NG-U transport bearer with the 5GC while keeping the UE context in the NG-RAN node. The procedure uses UE-associated signalling.

In this version of the specification, this procedure applies only if the NG-RAN node is an ng-eNB.

8.3.11.2 Successful Operation

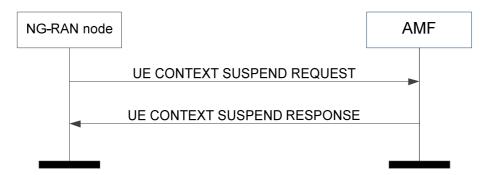


Figure 8.3.11.2-1: UE Context Suspend: Successful operation.

The NG-RAN node initiates the procedure by sending the UE CONTEXT SUSPEND REQUEST message to the AMF.

Upon receipt of the UE CONTEXT SUSPEND REQUEST message the AMF shall act as defined in TS 23.502 [10].

Upon receipt of the UE CONTEXT SUSPEND RESPONSE message the NG-RAN node shall suspend the UE context, the UE-associated logical NG-connection and the related PDU session contexts and send the UE to RRC_IDLE.

If the *Information on Recommended Cells and RAN Nodes for Paging* IE is included in the UE CONTEXT SUSPEND REQUEST message, the AMF shall, if supported, store it and may use it for subsequent paging.

If the *Paging Assistance Data for CE Capable UE* IE is included in the UE CONTEXT SUSPEND REQUEST message, the AMF shall, if supported, store it and use it for subsequent paging, as specified in TS 23.502 [10].

If the *Security Context* IE is included in the UE CONTEXT SUSPEND RESPONSE message, the NG-RAN node shall store the received *Security Context* IE in the UE context and remove any existing unused stored {NH, NCC} as specified in TS 33.501 [13].

If the *Suspend Indicator* IE is included in the UE CONTEXT SUSPEND REQUEST message, the SMF shall, if supported, consider the associated PDU session as suspended.

8.3.11.3 Unsuccessful Operation

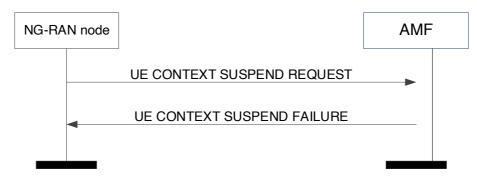


Figure 8.3.11.3-1: UE Context Suspend: unsuccessful operation.

If the AMF decides to not suspend the connection e.g. due to pending downlink data to be sent, it shall send the UE CONTEXT SUSPEND FAILURE message to the NG-RAN node.

8.3.11.4 Abnormal Conditions

Void.

8.3.12 UE Context Resume

8.3.12.1 General

The purpose of the UE Context Resume procedure is to resume the UE context, the suspended UE-associated logical NG-connection and the related NG-U transport bearer in the 5GC for this UE. The procedure uses UE-associated signalling.

In this version of the specification, this procedure applies only if the NG-RAN node is an ng-eNB.

8.3.12.2 Successful Operation

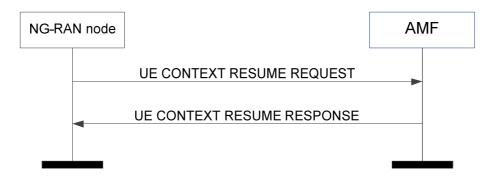


Figure 8.3.12.2-1: UE Context Resume procedure. Successful operation.

The NG-RAN node initiates the procedure by sending the UE CONTEXT RESUME REQUEST message to the AMF. If the NG-RAN node is not able to admit any suspended PDU sessions, the NG-RAN node shall indicate this in the *PDU Session Resource Failed to Resume List* IE. If the NG-RAN node is not able to admit certain QoS flows for a PDU session, the NG-RAN node shall indicate this in the *QoS Flow Failed to Resume List* IE included in the *UE Context Resume Request Transfer* IE for that PDU session.

Upon receipt of the UE CONTEXT RESUME REQUEST message the AMF shall act as defined in TS 23.502 [10] and respond with the UE CONTEXT RESUME RESPONSE message. If the AMF is not able to admit any suspended PDU sessions, the AMF shall indicate this in the *PDU Session Resource Failed to Resume List* IE. If the SMF is not able to admit certain QoS flows for a PDU session, the SMF shall indicate this in the *QoS Flow Failed to Resume List* IE included in the *UE Context Resume Response Transfer* IE for that PDU session.

The NG-RAN node shall release resources for each PDU session or QoS flow failed to resume and shall assume that the 5GC has released respective resources as well.

If the *Security Context* IE is included in the UE CONTEXT RESUME RESPONSE message, the NG-RAN node shall store the received *Security Context* IE in the UE context and the NG-RAN node shall use it for the next suspend/resume or Xn handover or Intra NG-RAN node handovers as specified in TS 33.501 [13].

If the Suspend Request Indication IE is included in the UE CONTEXT RESUME REQUEST message, the AMF shall, if supported, consider that the NG-RAN node is requesting immediate transition to RRC IDLE with Suspend as specified in TS 23.502 [10]. If the Suspend Response Indication IE is included in the UE CONTEXT RESUME RESPONSE message, the NG-RAN node shall suspend the UE context, the UE-associated logical NG-connection and the related PDU session contexts and send the UE to RRC IDLE.

If the *Information on Recommended Cells and RAN Nodes for Paging* IE is included in the UE CONTEXT RESUME REQUEST message, the AMF shall, if supported, store it and may use it for subsequent paging.

If the *Paging Assistance Data for CE Capable UE* IE is included in the UE CONTEXT RESUME REQUEST message, the AMF shall, if supported, store it and use it for subsequent paging, as specified in TS 23.502 [10].

If the *Extended Connected Time* IE is included in the UE CONTEXT RESUME RESPONSE message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

8.3.12.3 Unsuccessful Operation

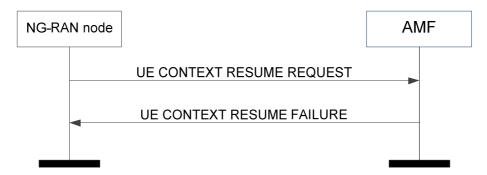


Figure 8.3.12.3-1: UE Context resume: unsuccessful operation.

If the AMF is not able to resume a single PDU session, it releases the UE-associated logical NG-connection by sending the UE CONTEXT RESUME FAILURE message to the NG-RAN node. Upon reception of the UE CONTEXT RESUME FAILURE message the NG-RAN node shall release the RRC connection as specified in TS 36.331 [21] and release all related signalling and user data transport resources.

8.4 UE Mobility Management Procedures

8.4.1 Handover Preparation

8.4.1.1 General

The purpose of the Handover Preparation procedure is to request the preparation of resources at the target side via the 5GC. There is only one Handover Preparation procedure ongoing at the same time for a certain UE. The procedure uses UE-associated signalling.

8.4.1.2 Successful Operation



Figure 8.4.1.2-1: Handover preparation: successful operation

The source NG-RAN node initiates the handover preparation by sending the HANDOVER REQUIRED message to the serving AMF. When the source NG-RAN node sends the HANDOVER REQUIRED message, it shall start the timer TNG_{RELOCprep}. The source NG-RAN node shall indicate the appropriate cause value for the handover in the *Cause* IE.

Upon reception of the HANDOVER REQUIRED message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transparently transfer the *Handover Required Transfer* IE to the SMF associated with the concerned PDU session.

In case of intra-system handover, the information in the *Source to Target Transparent Container* IE shall be encoded according to the definition of the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE.

If the *DL Forwarding* IE is included for a given QoS flow in the *PDU Session Resource Information Item* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message

and it is set to "DL forwarding proposed", it indicates that the source NG-RAN node proposes forwarding of downlink data for that QoS flow.

If the *UL Forwarding* IE is included for a given QoS flow in the *PDU Session Resource Information Item* IE within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of the HANDOVER REQUIRED message and it is set to "UL forwarding proposed", it indicates that the source NG-RAN node proposes forwarding of uplink data for that QoS flow.

If the *DRBs to QoS Flows Mapping List* IE is included in the *PDU Session Resource Information Item* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message, it implicitly indicates that the source NG-RAN node proposes forwarding of downlink data for those DRBs.

If the *QoS Flow Mapping Indication* IE for a QoS flow is included in the *Associated QoS Flow List* IE within the *DRBs to QoS Flows Mapping List* IE within the *Source NG-RAN node to Target NG-RAN node Transparent Container* IE of the HANDOVER REQUIRED message, it indicates that the source NG-RAN node has mapped only the uplink or downlink of the QoS flow to the DRB.

The source NG-RAN node shall, for each MRB of each MBS session contained in the MBS Session Information Target to Source List IE, start data forwarding to the TNL address contained in the DL Forwarding UP TNL Information IE. If the MRB Progress Information IE is contained for an MRB in the Data Forwarding Response MRB List IE in the MBS Session Information Target to Source List IE, the source NG-RAN node may use this information to determine when to stop data forwarding.

In case of intra-system handover, if the HANDOVER COMMAND message contains the *DL Forwarding UP TNL Information* IE for a given DRB within the *Data Forwarding Response DRB List* IE in the *Handover Command Transfer* IE, the source NG-RAN node shall consider that the forwarding of downlink data for this DRB is accepted by the target NG-RAN node. If the HANDOVER COMMAND message contains the *UL Forwarding UP TNL Information* IE for a given DRB in the *Data Forwarding Response DRB List* IE within the *Handover Command Transfer* IE, it means the target NG-RAN node has requested the forwarding of uplink data for this DRB.

In case direct data forwarding is applied for inter-system handover, if the *Data Forwarding Response E-RAB List* IE in the *Handover Command Transfer* IE is included in the HANDOVER COMMAND message, the source NG-RAN node shall consider that forwarding of downlink data for this E-RAB is accepted by the target eNB.

If the HANDOVER COMMAND message contains the *UL Forwarding UP TNL Information* IE for a given PDU session within the *Handover Command Transfer* IE, the source NG-RAN node shall consider that the forwarding of uplink data of the QoS flows is accepted by the target NG-RAN node.

In case of inter-system handover to LTE, the information in the *Source to Target Transparent Container* IE shall be encoded according to the *Source eNB to Target eNB Transparent Container* IE definition as specified in TS 36.413 [16].

If the *Direct Forwarding Path Availability* IE is included in the HANDOVER REQUIRED message the AMF shall handle it as specified in TS 23.502 [10].

If the *Direct Forwarding Path Availability* IE is included within the *Handover Required Transfer* IE of the HANDOVER REQUIRED message the SMF shall handle it as specified in TS 23.502 [10].

When the preparation, including the reservation of resources at the target side is ready, the AMF responds with the HANDOVER COMMAND message to the source NG-RAN node. In case of intra-system handover, the AMF shall include the *PDU Session Resource Handover List* IE in the HANDOVER COMMAND message.

Upon reception of the HANDOVER COMMAND message the source NG-RAN node shall stop the timer TNG_{RELOCoverall}.

If there are any PDU sessions that could not be admitted in the target, they shall be indicated in the *PDU Session Resource to Release List* IE.

NOTE: As an exception in case of inter-system handover to LTE, the AMF generates the *Handover Preparation Unsuccessful Transfer* IE in the *PDU Session Resource to Release List* IE.

If the HANDOVER COMMAND message contains the *QoS Flow to be Forwarded List* IE and/or *Data Forwarding Response DRB List* IE within the *Handover Command Transfer* IE for a given PDU session, then the source NG-RAN node should initiate data forwarding for the QoS flows as specified in TS 38.300 [8].

If the HANDOVER COMMAND message contains the *Additional DL Forwarding UP TNL Information* IE within the *Handover Command Transfer* IE, the source NG-RAN node should initiate data forwarding of the PDU session split in different tunnel and shall use the received UP transport layer information for the forwarding QoS flows associated to it.

If the HANDOVER COMMAND message contains the *Additional UL Forwarding UP TNL Information* IE within the *Handover Command Transfer* IE, the source NG-RAN node should initiate data forwarding of the PDU session split in different tunnels using the received UP transport layer information.

If the NAS Security Parameters from NG-RAN IE is included in the HANDOVER COMMAND message the NG-RAN node shall use it as specified in TS 33.501 [13].

If the *Target to Source Transparent Container* IE has been received by the AMF from the handover target then the transparent container shall be included in the HANDOVER COMMAND message.

If the HANDOVER COMMAND message contains the *QoS Flow Failed to Setup List* IE within the *Handover Command Transfer* IE, the source NG-RAN node shall consider that the listed QoS flows are failed to be handed over.

In case of inter-system handover to LTE, the information in the *Target to Source Transparent Container* IE shall be encoded according to the definition of the *Target eNB to Source eNB Transparent Container* IE as specified in TS 36.413 [16].

If the *Index to RAT/Frequency Selection Priority* IE is contained in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE, the target NG-RAN node shall store the content of the received *Index to RAT/Frequency Selection Priority* IE in the UE context and use it as defined in TS 23.501 [9].

If the *DAPS Request Information* IE is included for a DRB in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE within the HANDOVER REQUIRED message, it indicates that the request concerns a DAPS Handover for that DRB, as described in TS 38.300 [8].

Interactions with other NGAP procedures:

If, after a HANDOVER REQUIRED message is sent and before the Handover Preparation procedure is terminated, the source NG-RAN node receives an AMF initiated PDU Session Management procedure on the same UE-associated signalling connection, the source NG-RAN node shall either:

1. Cancel the Handover Preparation procedure by executing the Handover Cancellation procedure with an appropriate cause value. After successful completion of the Handover Cancellation procedure, the source NG-RAN node shall continue the AMF initiated PDU Session Management procedure.

or

2. Terminate the AMF initiated PDU Session Management procedure by sending the appropriate response message with an appropriate cause value, e.g. "NG intra-system handover triggered" or "NG inter-system handover triggered" to the AMF and then the source NG-RAN node shall continue with the handover procedure.

8.4.1.3 Unsuccessful Operation

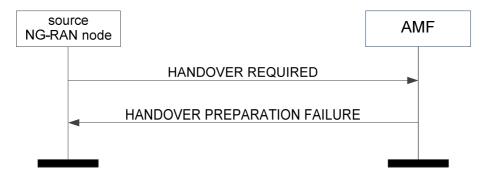


Figure 8.4.1.3-1: Handover preparation: unsuccessful operation

If the 5GC or the target side is not able to accept any of the PDU session resources or a failure occurs during the Handover Preparation, the AMF sends the HANDOVER PREPARATION FAILURE message with an appropriate cause value to the source NG-RAN node.

If the *Target to Source Failure Transparent Container* IE has been received by the AMF from the handover target then the transparent container shall be included in the HANDOVER PREPARATION FAILURE message.

If the *Target to Source Failure Transparent Container* IE is received in the HANDOVER PREPARATION FAILURE message including the *Cell CAG Information* IE, the source NG-RAN node shall, if supported, store and replace the PNI-NPN information associated with the indicated cell.

Interaction with Handover Cancel procedure:

If there is no response from the AMF to the HANDOVER REQUIRED message before timer TNG_{RELOCprep} expires in the source NG-RAN node, the source NG-RAN node should cancel the Handover Preparation procedure by initiating the Handover Cancel procedure with the appropriate value for the *Cause* IE. The source NG-RAN node shall ignore any HANDOVER COMMAND message or HANDOVER PREPARATION FAILURE message received after the initiation of the Handover Cancel procedure.

8.4.1.4 Abnormal Conditions

In case of inter-system handover, if the NG-RAN node receives at least one PDU Session ID included in the *PDU Session Resource Handover List* IE without at least one valid associated GTP tunnel address pair (in either UL or DL), then the NG-RAN node shall consider it as a logical error and act as described in subclause 10.4. A GTP tunnel address pair is considered valid if both the *GTP-TEID* IE and the *Endpoint IP Address* IE are present.

8.4.2 Handover Resource Allocation

8.4.2.1 General

The purpose of the Handover Resource Allocation procedure is to reserve resources at the target NG-RAN node for the handover of a UE. The procedure uses UE-associated signalling.

8.4.2.2 Successful Operation



Figure 8.4.2.2-1: Handover resource allocation: successful operation

The AMF initiates the procedure by sending the HANDOVER REQUEST message to the target NG-RAN node.

If the *Masked IMEISV* IE is contained in the HANDOVER REQUEST message the target NG-RAN node shall, if supported, use it to determine the characteristics of the UE for subsequent handling.

Upon receipt of the HANDOVER REQUEST message the target NG-RAN node shall

- attempt to execute the requested PDU session configuration and associated security;
- store the received UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9];
- store the received Mobility Restriction List in the UE context;
- store the received UE Security Capabilities in the UE context;
- store the received Security Context in the UE context and take it into use as defined in TS 33.501 [13];

- if supported, store the received UE Slice Maximum Bit Rate List in the UE context and use the received UE Slice Maximum Bit Rate List for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

Upon reception of the *UE History Information* IE, which is included within the *Source to Target Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall collect the information defined as mandatory in the *UE History Information* IE and shall, if supported, collect the information defined as optional in the *UE History Information* IE, for as long as the UE stays in one of its cells, and store the collected information to be used for future handover preparations.

Upon receiving the *PDU Session Resource Setup List* IE contained in the HANDOVER REQUEST message, the target NG-RAN node shall behave the same as defined in the PDU Session Resource Setup procedure. The target NG-RAN node shall report to the AMF in the HANDOVER REQUEST ACKNOWLEDGE message the result for each PDU session resource requested to be setup. In particular, for each PDU session resource successfully setup, it shall include the *Handover Request Acknowledge Transfer* IE containing the following information:

- The list of QoS flows which have been successfully established in the QoS Flow Setup Response List IE.
- The Data Forwarding Accepted IE if the data forwarding for the QoS flow is accepted.
- The list of QoS flows which have failed to be established, if any, in the QoS Flow Failed to Setup List IE.
- The UP transport layer information to be used for the PDU session.
- The security result associated to the PDU session.
- The redundant UP transport layer information to be used for the redundant transmission for the PDU session.

For each PDU session resource which failed to be setup, the *Handover Resource Allocation Unsuccessful Transfer* IE shall be included in the HANDOVER REQUEST ACKNOWLEDGE message containing a cause value that should be precise enough to enable the SMF to know the reason for the unsuccessful establishment.

For each PDU session included in the HANDOVER REQUEST ACKNOWLEDGE message, if the *Current QoS Parameters Set Index* IE is included for a QoS flow in the *QoS Flow Setup Response List* IE within the *Handover Request Acknowledge Transfer* IE the SMF shall consider it as the currently fulfilled QoS parameters set among the alternative QoS parameters for the involved QoS flow.

Upon reception of the HANDOVER REQUEST ACKNOWLEDGE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *Handover Request Acknowledge Transfer* IE or *Handover Resource Allocation Unsuccessful Transfer* IE to the SMF associated with the concerned PDU session.

If the HANDOVER REQUEST message contains the *Data Forwarding Not Possible* IE associated with a given PDU session within the *Handover Request Transfer* IE set to "data forwarding not possible", the target NG-RAN node may not include the *DL Forwarding UP TNL Information* IE and for intra-system handover the *Data Forwarding Response DRB List* IE within the *Handover Request Acknowledge Transfer* IE in the HANDOVER REQUEST ACKNOWLEDGE message for that PDU session.

If the HANDOVER REQUEST message contains the *Redundant PDU Session Information* IE associated with a given PDU session within the *Handover Request Transfer* IE, the target NG-RAN node shall, if supported, store the received information in the UE context and use it for redundant PDU session setup as specified in TS38.300 [8] and TS 23.501 [9]. If the *PDU Session Type* IE is set to "ethernet" and the redundancy requirement is fulfilled using a secondary NG-RAN node, the NG-RAN node shall, if supported, include the *Global RAN Node ID of Secondary NG-RAN Node* IE in the *Handover Request Acknowledge Transfer* IE of the HANDOVER REQUEST ACKNOWLEDGE message. If the *PDU Session Pair ID* IE is included in the *Redundant PDU Session Information* IE, the NG-RAN node may use it to identify the paired PDU sessions.

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *Handover Request Acknowledge Transfer* IE of the HANDOVER REQUEST ACKNOWLEDGE message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

In case of intra-system handover, if the target NG-RAN node accepts the downlink data forwarding for at least one QoS flow for which the *DL Forwarding* IE is set to "DL forwarding proposed", it may include the *DL Forwarding UP TNL Information* IE in the *Handover Request Acknowledge Transfer* IE as forwarding tunnel for the QoS flows listed in the *QoS Flow Setup Response List* IE of the HANDOVER REQUEST ACKNOWLEDGE message.

In case of intra-system handover, if the target NG-RAN node accepts the uplink data forwarding for at least one QoS flow for which the *UL Forwarding* IE is set to "UL forwarding proposed", it may include the *UL Forwarding UP TNL Information* IE in the *Handover Request Acknowledge Transfer* IE for the PDU session within the *PDU Session Resource Admitted List* IE of the HANDOVER REQUEST ACKNOWLEDGE message.

In case of intra-system handover, for each PDU session for which the Additional DL UP TNL Information for HO List IE is included in the Handover Request Acknowledge Transfer IE of the HANDOVER REQUEST ACKNOWLEDGE message, the SMF shall consider the included Additional DL NG-U UP TNL Information IE as the downlink termination point for the associated flows indicated in the Additional QoS Flow Setup Response List IE for this PDU session split in different tunnels and shall consider the Additional DL Forwarding UP TNL Information IE, if included, as the forwarding tunnel associated to these QoS flows.

In case of intra-system handover, for each PDU session for which the *Additional UL Forwarding UP TNL Information* IE is included in the *Handover Request Acknowledge Transfer* IE of the HANDOVER REQUEST ACKNOWLEDGE message, the SMF shall consider it as the termination points for the uplink forwarding tunnels for this PDU session split in different tunnels.

In case of intra-system handover, if the target NG-RAN node accepts the data forwarding for a successfully configured DRB, the target NG-RAN node may include the *DL Forwarding UP TNL Information* IE for the DRB within the *Data Forwarding Response DRB List* IE within *Handover Request Acknowledge Transfer* IE of the HANDOVER REQUEST ACKNOWLEDGE message.

In case of intra-system handover, if the target NG-RAN node receives the *Direct Forwarding Path Availability* IE set to "direct path available" within the *PDU Session Resource Setup Request Transfer* IE, the target NG-RAN node shall, if supported, assign the UP Transport Layer Information for intra-system direct data forwarding from the appropriate address space, if applicable.

If the HANDOVER REQUEST ACKNOWLEDGE message contains the *UL Forwarding UP TNL Information* IE for a given DRB in the *Data Forwarding Response DRB List* IE within the *Handover Request Acknowledge Transfer* IE, it indicates the target NG-RAN node has requested the forwarding of uplink data for the DRB.

In case of inter-system handover from E-UTRAN, if the *PDU Session Resource Setup Request Transfer* IE contains the *Direct Forwarding Path Availability* IE set to "direct path available", the target NG-RAN node shall, if supported, and if it accepts downlink data forwarding for the QoS flows mapped to an E-RAB of an admitted PDU session, include the *DL Forwarding UP TNL Information* IE in the *Data Forwarding Response E-RAB List* IE in the *Handover Request Acknowledge Transfer* IE in the HANDOVER REQUEST ACKNOWLEDGE message for that mapped E-RAB.

In case of inter-system handover from E-UTRAN, the target NG-RAN node includes the *Data Forwarding Accepted* IE for each QoS flow that the *DL Forwarding* IE is set to "DL forwarding proposed" for the corresponding E-RAB in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE and that the target NG-RAN node has admitted the proposed forwarding of downlink data for the QoS flow. If indirect data forwarding is applied for intersystem handover, if the target NG-RAN node accepts the downlink data forwarding for at least one QoS flow of an admitted PDU session it shall include the *DL Forwarding UP TNL Information* IE in the *PDU Session Resource Setup Response Transfer* IE for that PDU session within the *PDU Session Resources Admitted List* IE of the HANDOVER REQUEST ACKNOWLEDGE message.

In case of inter-system handover from E-UTRAN with direct forwarding, if the target NG-RAN node receives the *SgNB UE X2AP ID* IE in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE, it may use it for internal forwarding as described in TS 37.340 [32].

In case of inter-system handover from E-UTRAN, if the target cell is a CAG cell, the target NG-RAN node shall include the *NPN Access Information* IE in the HANDOVER REQUEST ACKNOWLEDGE message, and the AMF shall consider that the included information is associated to the target cell and to the UE's serving PLMN identity, and use it as specified in TS 23.501 [9].

The target NG-RAN node shall use the information in the *Mobility Restriction List* IE if present in the HANDOVER REQUEST message to

- determine a target for subsequent mobility action for which the target NG-RAN node provides information about the target of the mobility action towards the UE;
- select a proper SCG during dual connectivity operation;
- assign proper RNA(s) for the UE when moving the UE to RRC_INACTIVE state.

If the *Mobility Restriction List* IE is not contained in the HANDOVER REQUEST message, the target NG-RAN node shall consider that no roaming and no access restriction apply to the UE. The target NG-RAN node shall also consider that no roaming and no access restriction apply to the UE when:

- one of the QoS flows includes a particular ARP value (TS 23.501 [9]).

If the *Trace Activation* IE is included in the HANDOVER REQUEST message the target NG-RAN node shall, if supported, initiate the requested trace function as described in TS 32.422 [11]. In particular, the NG-RAN node shall, if supported:

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT and Trace", initiate the requested trace session and MDT session as described in TS 32.422 [11];
- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT Only", "Logged MDT only", initiate the requested MDT session as described in TS 32.422 [11] and the target NG-RAN node shall ignore the *Interfaces To Trace* IE and the *Trace Depth* IE;
- if the *Trace Activation* IE includes the *MDT Location Information* IE within the *MDT Configuration* IE, store this information and take it into account in the requested MDT session;
- if the *Trace Activation* IE includes the *Signalling Based MDT PLMN List* IE within the *MDT Configuration* IE, the NG-RAN node may use it to propagate the MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *Bluetooth Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *WLAN Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *Sensor Measurement Configuration* IE within the *MDT Configuration* IE, take it into account for MDT Configuration as described in TS 37.320 [41].
- if the *Trace Activation* IE includes the *MDT Configuration* IE and if the NG-RAN node is a gNB at least the *MDT Configuration-NR* IE shall be present, while if the NG-RAN node is an ng-eNB at least the *MDT Configuration-EUTRA* IE shall be present.

If the *Location Reporting Request Type* IE is included in the HANDOVER REQUEST message, the target NG-RAN node should perform the requested location reporting functionality for the UE as described in subclause 8.12.

If the *Core Network Assistance Information for RRC INACTIVE* IE is included in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information in the UE context and use it for the RRC_INACTIVE state decision and RNA configuration for the UE and RAN paging if any for a UE in RRC_INACTIVE state, as specified in TS 38.300 [8]. If the *MICO All PLMN* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE the NG-RAN node shall, if supported, consider that the registration area for the UE is the full PLMN and ignore the *TAI List for RRC Inactive* IE. If the *Paging Cause Indication for Voice Service* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store and use it as specified in TS 38.300 [8]. If the *PEIPS Assistance Information* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store it and use it for paging subgrouping the UE in RRC_INACTIVE state, as specified in TS 38.300 [8].

If the *CN Assisted RAN Parameters Tuning* IE is included in the HANDOVER REQUEST message, the NG-RAN node may use it as described in TS 23.501 [9].

If the *New Security Context Indicator* IE is included in the HANDOVER REQUEST message, the target NG-RAN node shall use the information as specified in TS 33.501 [13].

If the *NASC* IE is included in the HANDOVER REQUEST message, the target NG-RAN node shall use it towards the UE as specified in TS 33.501 [13].

If the *RRC Inactive Transition Report Request* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context.

If the *Redirection for Voice EPS Fallback* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store it and use it in a subsequent decision of EPS fallback for voice as specified in TS 23.502 [10].

If the *SRVCC Operation Possible* IE is included in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store the content of the received *SRVCC Operation Possible* IE in the UE context and use it as defined in TS 23.216 [31].

If the *IAB Authorized* IE is contained in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, consider that the handover is for an IAB node.

If the *Enhanced Coverage Restriction* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

If the *UE User Plane CIoT Support Indicator* IE is included in the HANDOVER REQUEST message the NG-RAN node shall, if supported, store this information in the UE context and consider that User Plane CIoT 5GS Optimisation as specified in TS 23.501 [9] is supported for the UE.

Upon reception of the *UE History Information from UE* IE, which is included within the *Source to Target Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store the collected information and use it for future handover preparations.

After all necessary resources for the admitted PDU session resources have been allocated, the target NG-RAN node shall generate the HANDOVER REQUEST ACKNOWLEDGE message.

If the *RedCap Indication* IE is included in the HANDOVER REQUEST ACKNOWLEDGE message, the AMF shall, if supported, consider the UE as a RedCap UE that was previously served by a E-UTRA cell, and use the IE according to TS 23.501 [9].

For each QoS flow which has been established in the target NG-RAN node, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the HANDOVER REQUEST message, the target NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the HANDOVER REQUEST message, the target NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

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

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

If the NR UE Sidelink Aggregate Maximum Bit Rate IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use the received value for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *LTE UE Sidelink Aggregate Maximum Bit Rate* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use the received value for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services.

If the *PC5 QoS Parameters* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use it as defined in TS 23.287 [33].

If the *CE-mode-B Restricted* IE is included in the HANDOVER REQUEST message and the *Enhanced Coverage Restriction* IE is not set to "restricted" and the Enhanced Coverage Restriction information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *Management Based MDT PLMN List* IE is contained in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store the received information in the UE context, and use this information to allow subsequent selections of the UE for management based MDT defined in TS 32.422 [11].

If the HANDOVER REQUEST message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

If the DAPS Request Information IE is included for a DRB in the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE within the HANDOVER REQUEST message, the target NG-RAN node shall consider that the request concerns a DAPS Handover for that DRB, as described in in TS 38.300 [8]. The target NG-RAN node shall include the DAPS Response information List IE in the Target NG-RAN Node to Source NG-RAN Node Transparent Container IE within the HANDOVER REQUEST ACKNOWLEDGE message, containing the DAPS Response Information IE for each DRB requested to be configured with DAPS Handover.

If the Extended Connected Time IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

If the target NG-RAN node receives the *UE Context Reference at Source* IE in the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE within the HANDOVER REQUEST message, it may use it to identify an existing UE.

If the Source Node ID IE is included in the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE within the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, use it to decide whether direct forwarding path is available between the target NG-RAN node and this source RAN node. If the direct forwarding path is available, the target NG-RAN node shall include the Direct Forwarding Path Availability IE in the Target NG-RAN Node to Source NG-RAN Node Transparent Container IE within the HANDOVER REQUEST ACKNOWLEDGE message.

In case there are MBS sessions the UE has joined, for all the MBS sessions the UE has joined, the SMF shall, if supported, include the MBS Session Setup Request List IE within the PDU Session Resource Setup Request Transfer IE in the HANDOVER REQUEST message.

If the HANDOVER REQUEST message contains the MBS Session Setup Request List IE in a PDU Session Resource Setup Request Transfer IE the NG-RAN node shall, if supported, use it as specified in TS 23.247 [44] and TS 38.300 [8].

If the MBS Active Session Information Source to Target List IE is contained in the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE within the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, assume the indicated MBS sessions to be active and establish MBS session resources as specified in TS 23.247 [44] and TS 38.300 [8], if applicable. The target NG-RAN node shall, if supported, consider that the MBS sessions the UE has joined which are not included in the MBS Active Session Information Source to Target List IE are inactive.

If the MBS Area Session ID IE is included in the MBS Active Session Information Source to Target List IE in the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE within the HANDOVER REQUEST message, the target NG-RAN shall use this information as indication from which MBS Area Session ID the UE is handed over.

If the MBS Service Area IE is included in the MBS Active Session Information Source to Target List IE in the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE within the HANDOVER REQUEST message, the target NG-RAN shall use this information to setup respective MBS session resources, if applicable.

If the target NG-RAN node decides to allocate resource for data forwarding for an active MBS session, respective information is provided for that MBS session within the *Data Forwarding Response MRB List* IE in the *MBS Active Session Information Target to Source List* IE in the *Target NG-RAN Node to Source NG-RAN Node Transparent Container* IE.

If the *Time Synchronisation Assistance Information* IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, store the information in the UE context and use it as defined in TS 23.501 [9].

If the 5G ProSe Authorized IE is contained in the HANDOVER REQUEST message and it contains one or more IEs set to "authorized", the NG-RAN node shall, if supported, consider that the UE is authorized for the relevant service(s).

If the 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use the received value for the concerned UE's sidelink communication in network scheduled mode for 5G ProSe services.

If the 5G ProSe PC5 QoS Parameters IE is included in the HANDOVER REQUEST message, the NG-RAN node shall, if supported, use it as defined in TS 23.304 [47].

If for a given QoS flow the Source Transport Layer Address IE is included within the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE of the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions for direct data

forwarding, if such ACL functionality is deployed and if direct forwarding path is available between the target NG-RAN node and this source RAN node.

If for a given QoS flow the *Source Node Transport Layer Address* IE is included within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions for direct data forwarding, if such ACL functionality is deployed and if direct forwarding path is available between the target NG-RAN node and this source RAN node.

If for a given E-RAB the *Source Transport Layer Address* IE is included within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions for direct data forwarding, if such ACL functionality is deployed and if direct forwarding path is available between the target NG-RAN node and this source RAN node.

If for a given E-RAB the *Source Node Transport Layer Address* IE is included within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions for direct data forwarding, if such ACL functionality is deployed and if direct forwarding path is available between the target NG-RAN node and this source RAN node.

If the HANDOVER REQUEST message contains within the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE the NGAP IE Support Information Request List IE, the target NG-RAN node shall, if supported and the target NG-RAN node accepts the request for handover, for each included NGAP Protocol IE-Id provided within the Target NG-RAN Node to Source NG-RAN Node Transparent Container IE in the HANDOVER REQUEST ACKNOWLEDGE message

- set the *NGAP Protocol IE Support Information* IE to "supported" if the target NG-RAN node has information that the functionality associated with the indicated IE is supported
- set the *NGAP Protocol IE Support Information* IE to "not-supported" if the target NG-RAN node has information that the functionality associated with the indicated IE is not supported

on the interface instance via which the HANDOVER REQUEST message has been received, and

- set the NGAP Protocol IE Presence Information IE to "present" if the target NG-RAN node has received the respective NGAP Protocol IE-Id in the HANDOVER REQUEST message, and "not-present" otherwise.

Interactions with RRC Inactive Transition Report procedure:

If the *RRC Inactive Transition Report Request* IE is included in the HANDOVER REQUEST message and set to "subsequent state transition report", the NG-RAN node shall, if supported, send the RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE when the UE enters or leaves RRC_INACTIVE state.

8.4.2.3 Unsuccessful Operation



Figure 8.4.2.3-1: Handover resource allocation: unsuccessful operation

If the target NG-RAN node does not admit any of the PDU session resources, or a failure occurs during the Handover Preparation, it shall send the HANDOVER FAILURE message to the AMF with an appropriate cause value.

If the HANDOVER REQUEST message contains within the *Source NG-RAN Node to Target NG-RAN Node Transparent Container* IE the *NGAP IE Support Information Request List* IE, the target NG-RAN node shall, if supported and the target NG-RAN node does not accept the request for handover, for each included NGAP Protocol IE-Id provided within the *Target NG-RAN Node to Source NG-RAN Node Failure Transparent Container* IE in the HANDOVER FAILURE message

- set the *NGAP Protocol IE Support Information* IE to "supported" if the target NG-RAN node has information that the functionality associated with the indicated IE is supported
- set the *NGAP Protocol IE Support Information* IE to "not-supported" if the target NG-RAN node has information that the functionality associated with the indicated IE is not supported

on the interface instance via which the HANDOVER REQUEST message has been received, and

- set the *NGAP Protocol IE Presence Information* IE to "present" if the target NG-RAN node has received the respective NGAP Protocol IE-Id in the HANDOVER REQUEST message, and "not-present" otherwise.

8.4.2.4 Abnormal Conditions

If the supported algorithms for encryption defined in the *Encryption Algorithms* IE in the *UE Security Capabilities* IE, plus the mandated support of EEA0 and NEA0 in all UEs (TS 33.501 [13]), do not match any allowed algorithms defined in the configured list of allowed encryption algorithms in the NG-RAN node (TS 33.501 [13]), the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message.

If the supported algorithms for integrity defined in the *Integrity Protection Algorithms* IE in the *UE Security Capabilities* IE, plus the mandated support of the EIAO and NIAO algorithm in all UEs (TS 33.501 [13]), do not match any allowed algorithms defined in the configured list of allowed integrity protection algorithms in the NG-RAN node (TS 33.501 [13]), the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message.

If the target NG-RAN node receives a HANDOVER REQUEST message which does not contain the *Mobility Restriction List* IE, and the serving PLMN cannot be determined otherwise by the NG-RAN node, the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message.

If the target NG-RAN node receives a HANDOVER REQUEST message containing the *Mobility Restriction List* IE, and the serving PLMN indicated is not supported by the target cell, the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message.

If the target NG-RAN node receives a HANDOVER REQUEST message containing an *Allowed PNI-NPN List* IE in the *Mobility Restriction List* IE which does not allow access to the cell indicated in the *Target Cell ID* IE, the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message with an appropriate cause value and may include the *Cell CAG Information* IE corresponding to this cell and the selected PLMN.

If the target NG-RAN node receives a HANDOVER REQUEST message containing a *Serving PLMN* IE and *Serving NID* IE in the *Mobility Restriction List* IE which does not allow access to the cell indicated in the *Target Cell ID* IE, the target NG-RAN node shall reject the procedure using the HANDOVER FAILURE message with an appropriate cause value.

8.4.3 Handover Notification

8.4.3.1 General

The purpose of the Handover Notification procedure is to indicate to the AMF that the UE has arrived to the target cell and the NG-based handover has been successfully completed. The procedure uses UE-associated signalling.

8.4.3.2 Successful Operation



Figure 8.4.3.2-1: Handover notification

The target NG-RAN node shall send the HANDOVER NOTIFY message to the AMF when the UE has been identified in the target cell and the NG-based handover has been successfully completed.

Interactions with Handover Success procedure:

If the *Notify Source NG-RAN Node* IE is included in the HANDOVER NOTIFY message, the AMF shall, if supported, notify the source NG-RAN node that the UE has successfully accessed the target NG-RAN node by sending the HANDOVER SUCCESS message.

8.4.3.3 Abnormal Conditions

Void.

8.4.4 Path Switch Request

8.4.4.1 General

The purpose of the Path Switch Request procedure is to establish a UE associated signalling connection to the 5GC and, if applicable, to request the switch of the downlink termination point of the NG-U transport bearer towards a new termination point. The procedure uses UE-associated signalling.

8.4.4.2 Successful Operation



Figure 8.4.4.2-1: Path switch request: successful operation

The NG-RAN node initiates the procedure by sending the PATH SWITCH REQUEST message to the AMF. Upon reception of the PATH SWITCH REQUEST message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transparently transfer the *Path Switch Request Transfer* IE to the SMF associated with the concerned PDU session.

When the NG-RAN node has received from the radio interface the *RRC Resume Cause* IE, it shall include it in the PATH SWITCH REQUEST message.

If the *RedCap Indication* IE is included in the PATH SWITCH REQUEST message, the AMF shall, if supported, consider the UE as a RedCap UE that was previously served by a E-UTRA cell, and use the IE according to TS 23.501 [9].

After all necessary updates including the UP path switch have been successfully completed in the 5GC for at least one of the PDU session resources included in the PATH SWITCH REQUEST, the AMF shall send the PATH SWITCH REQUEST ACKNOWLEDGE message to the NG-RAN node and the procedure ends.

The list of accepted QoS flows shall be included in the PATH SWITCH REQUEST message within the *Path Switch Request Transfer* IE. The SMF shall handle this information as specified in TS 23.502 [10].

For each PDU session for which the *Additional DL QoS Flow per TNL Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF may use each included UP transport layer information as the downlink termination point for the included associated QoS flows for this PDU session split in different tunnels.

The list of PDU sessions which failed to be setup, if any, shall be included in the PATH SWITCH REQUEST message within the *Path Switch Request Setup Failed Transfer* IE. The AMF shall handle this information as specified in TS 23.502 [10].

For each PDU session for which the *User Plane Security Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall behave as specified in TS 33.501 [13] and may send back the *Security Indication* IE within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message.

For each PDU session for which the *DL NG-U TNL Information Reused* IE set to "true" is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, consider that the DL TNL information contained in the *DL NG-U UP TNL Information* IE has been reused.

For each PDU session for which the *Additional Redundant DL QoS Flow per TNL Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF may use each included UP transport layer information as the downlink termination point for the included associated QoS flows for this PDU session split in different tunnels for the redundant transmission.

For each PDU session for which the *Redundant DL NG-U TNL Information Reused* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, consider the included DL transport layer address as the DL transport layer address for the redundant transmission as specified in TS 23.501 [9].

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

For each PDU session included in the PATH SWITCH REQUEST message, if the *Current QoS Parameters Set Index* IE is included in the *Path Switch Request Transfer* IE the SMF shall consider it as the currently fulfilled QoS parameters set among the alternative QoS parameters for the involved QoS flow.

If the Security Indication IE is included within the Path Switch Request Acknowledge Transfer IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall behave as specified in TS 33.501 [13].

If the *UL NG-U UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall store this information and use it as the uplink termination point for the user plane data for this PDU session.

If the *Additional NG-U UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall store this information and use the included *UL NG-U UP TNL Information* IE(s) as the uplink termination point(s) of the user plane data for this PDU session split in different tunnel.

If the *Redundant UL NG-U UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information and use it as the uplink termination point for the user plane data for the redundant transmission for this PDU session as specified in TS 23.501 [9].

If the Additional Redundant NG-U UP TNL Information IE is included within the Path Switch Request Acknowledge Transfer IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported,

store this information and use the included *UL NG-U UP TNL Information* IE(s) as the uplink termination point(s) of the user plane data for this PDU session split in different tunnel.

If the CN Packet Delay Budget Downlink IE is included within the Path Switch Request Acknowledge Transfer IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided CN Packet Delay Budget Downlink if any and use it as specified in TS 23.502 [10].

If the CN Packet Delay Budget Uplink IE is included within the Path Switch Request Acknowledge Transfer IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided CN Packet Delay Budget Uplink if any and use it as specified in TS 23.502 [10].

If the *Burst Arrival Time Downlink* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided value if any and use it as specified in TS 23.502 [10].

If the *Core Network Assistance Information for RRC INACTIVE* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context and use it for the RRC_INACTIVE state decision and RNA configuration for the UE and RAN paging if any for a UE in RRC_INACTIVE state, as specified in TS 38.300 [8]. If the *MICO All PLMN* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE the NG-RAN node shall, if supported, consider that the registration area for the UE is the full PLMN and ignore the *TAI List for RRC Inactive* IE. If the *Paging Cause Indication for Voice Service* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store and use it as specified in TS 38.300 [8]. If the *PEIPS Assistance Information* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store it and use it for paging subgrouping the UE in RRC_INACTIVE state, as specified in TS 38.300 [8].

If the *CN Assisted RAN Parameters Tuning* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node may use it as described in TS 23.501 [9].

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context.

If the *New Security Context Indicator* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall use the information as specified in TS 33.501 [13].

Upon reception of the PATH SWITCH REQUEST ACKNOWLEDGE message the NG-RAN node shall store the received *Security Context* IE in the UE context and the NG-RAN node shall use it as specified in TS 33.501 [13].

If the *UE Security Capabilities* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall handle it accordingly (TS 33.501 [13]).

If the *Redirection for Voice EPS Fallback* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store it and use it in a subsequent decision of EPS fallback for voice as specified in TS 23.502 [10].

If the *PDU Session Resource Released List* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall release the corresponding QoS flows and regard the PDU session(s) indicated in the *PDU Session Resource Released List* IE as being released. The appropriate cause value for each PDU session released is included in the *Path Switch Request Unsuccessful Transfer* IE contained in the PATH SWITCH REQUEST ACKNOWLEDGE message.

If the *SRVCC Operation Possible* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store the content of the received *SRVCC Operation Possible* IE in the UE context and use it as defined in TS 23.216 [31].

If the *Enhanced Coverage Restriction* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *Extended Connected Time* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

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

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

If the NR UE Sidelink Aggregate Maximum Bit Rate IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;
- use the received value for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *LTE UE Sidelink Aggregate Maximum Bit Rate* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value:
- use the received value for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services.

If the *PC5 QoS Parameters* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as defined in TS 23.287 [33].

If the *CE-mode-B Restricted* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and the *Enhanced Coverage Restriction* IE is not set to "restricted" and the Enhanced Coverage Restriction information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE User Plane CIoT Support Indicator* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message the NG-RAN node shall, if supported, store this information in the UE context and consider that User Plane CIoT 5GS Optimisation as specified in TS 23.501 [9] is supported for the UE.

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *Alternative QoS Parameters Set List* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.502 [10].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *Management Based MDT PLMN List* IE, the NG-RAN node shall store it in the UE context, and if supported, use it to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [11].

If the *Time Synchronisation Assistance Information* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store the information in the UE context and use it as defined in TS 23.501 [9].

If the 5G ProSe Authorized IE is contained in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, update its ProSe authorization information for the UE accordingly. If the 5G ProSe Authorized IE includes one and more IEs set to "not authorized", the NG-RAN node shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant 5G ProSe service(s).

If the 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided 5G ProSe UE PC5 Aggregate Maximum Bit Rate, if available in the UE context, with the received value:
- use the received value for the concerned UE's sidelink communication in network scheduled mode for 5G ProSe services.

If the 5G ProSe PC5 QoS Parameters IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as defined in TS 23.304 [47].

Interactions with RRC Inactive Transition Report procedure:

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and set to "single RRC connected state report" and the UE is in RRC_CONNECTED state, the NG-RAN node shall, if supported, send one RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE.

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and set to "single RRC connected state report" and the UE is in RRC_INACTIVE state, the NG-RAN node shall, if supported, send to the AMF one RRC INACTIVE TRANSITION REPORT message plus one subsequent RRC INACTIVE TRANSITION REPORT message when the RRC state transitions to RRC_CONNECTED state.

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and set to "subsequent state transition report", the NG-RAN node shall, if supported, send one RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE and subsequent RRC INACTIVE TRANSITION REPORT messages to report the RRC state of the UE when the UE enters or leaves RRC INACTIVE state.

Interactions with PDU Session Resource Notify procedure:

If the QoS related parameters (e.g. the *CN Packet Delay Budget Downlink* IE or the *CN Packet Delay Budget Uplink* IE) are included in the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, but can not be successfully accepted by the NG-RAN node, the NG-RAN node should continue to use the old values received from the source NG-RAN node, if any. The NG-RAN node shall, if supported, send the PDU SESSION RESOURCE NOTIFY message to notify the AMF.

8.4.4.3 Unsuccessful Operation

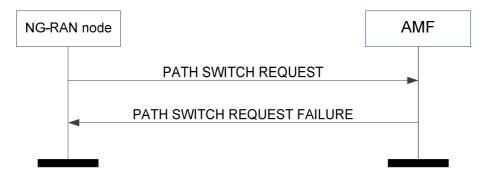


Figure 8.4.4.3-1: Path switch request: unsuccessful operation

If the 5GC fails to switch the downlink termination point of the NG-U transport bearer towards a new termination point for all PDU session resources, the AMF shall send the PATH SWITCH REQUEST FAILURE message to the NG-RAN node.

The NG-RAN node shall release the corresponding QoS flows and regard the PDU session(s) indicated in the *PDU* Session Resource Released List IE included in the PATH SWITCH REQUEST FAILURE message as being released.

The appropriate cause value for each PDU session released is included in the *Path Switch Request Unsuccessful Transfer* IE contained in the PATH SWITCH REQUEST FAILURE message.

8.4.4.4 Abnormal Conditions

If the AMF receives a PATH SWITCH REQUEST message containing several *PDU Session ID* IEs (in the *PDU Session Resource to be Switched in Downlink List* IE) set to the same value, the AMF shall send the PATH SWITCH REQUEST FAILURE message to the NG-RAN node.

NOTE: As an exception, the AMF generates the Path Switch Request Unsuccessful Transfer IE.

8.4.5 Handover Cancellation

8.4.5.1 General

The purpose of the Handover Cancellation procedure is to enable a source NG-RAN node to cancel an ongoing handover preparation or an already prepared handover. The procedure uses UE-associated signalling.

8.4.5.2 Successful Operation



Figure 8.4.5.2-1: Handover cancel: successful operation

The source NG-RAN node initiates the procedure by sending a HANDOVER CANCEL message to the AMF.

8.4.5.3 Unsuccessful Operation

Not applicable.

8.4.5.4 Abnormal Conditions

If the source NG-RAN node becomes aware of the fact that an expected HANDOVER CANCEL ACKNOWLEDGE message is missing, the source NG-RAN node shall consider the Handover Cancellation procedure as successfully terminated.

8.4.6 Uplink RAN Status Transfer

8.4.6.1 General

The purpose of the Uplink RAN Status Transfer procedure is to enable lossless NG-based handover. The procedure uses UE-associated signalling.

8.4.6.2 Successful Operation



Figure 8.4.6.2-1: Uplink RAN status transfer

The source NG-RAN node initiates the procedure by stopping the assigning of PDCP-SNs to downlink SDUs and sending the UPLINK RAN STATUS TRANSFER message to the AMF at the point in time when it considers the transmitter/receiver status to be frozen.

For each DRB for which PDCP-SN and HFN status preservation applies, the source NG-RAN node shall include the *DRB ID* IE, the *UL COUNT Value* IE and the *DL COUNT Value* IE within the *DRBs Subject to Status Transfer List* IE in the *RAN Status Transfer Transparent Container* IE of the UPLINK RAN STATUS TRANSFER message.

The source NG-RAN node may also include in the UPLINK RAN STATUS TRANSFER message the missing and the received uplink SDUs in the *Receive Status of UL PDCP SDUs* IE for each DRB for which the source NG-RAN node has accepted the request from the target NG-RAN node for uplink forwarding.

8.4.6.3 Abnormal Conditions

Void.

8.4.7 Downlink RAN Status Transfer

8.4.7.1 General

The purpose of the Downlink RAN Status Transfer procedure is to enable lossless NG-based handover. The procedure uses UE-associated signalling.

8.4.7.2 Successful Operation



Figure 8.4.7.2-1: Downlink RAN status transfer

The AMF initiates the procedure by sending the DOWNLINK RAN STATUS TRANSFER message to the target NG-RAN node. The target NG-RAN node using Full Configuration for this handover as per TS 38.300 [8] shall ignore the information received in this message.

For each DRB in the *DRBs Subject to Status Transfer List* IE within the *RAN Status Transfer Transparent Container* IE, the target NG-RAN node shall not deliver any uplink packet which has a PDCP-SN lower than the value of the *UL Count Value* IE.

For each DRB in the *DRBs Subject to Status Transfer List* IE within the *RAN Status Transfer Transparent Container* IE, the target NG-RAN node shall use the value of the *DL COUNT Value* IE for the first downlink packet for which there is no PDCP-SN yet assigned.

If the *Receive Status of UL PDCP SDUs* IE is included for at least one DRB in the *RAN Status Transfer Transparent Container* IE of the DOWNLINK RAN STATUS TRANSFER message, the target NG-RAN node may use it in a Status Report message sent to the UE over the radio interface.

8.4.7.3 Abnormal Conditions

If the target NG-RAN node receives this message for a UE for which no prepared handover exists at the target NG-RAN node, the target NG-RAN node shall ignore the message.

8.4.8 Handover Success

8.4.8.1 General

The Handover Success procedure is used during a DAPS Handover, to inform the source NG-RAN node that the UE has successfully accessed the target NG-RAN node. The procedure uses UE-associated signalling.

8.4.8.2 Successful Operation



Figure 8.4.8.2-1: Handover Success

The AMF initiates the procedure by sending the HANDOVER SUCCESS message to the source NG-RAN node.

8.4.8.3 Abnormal Conditions

If the HANDOVER SUCCESS message refers to a context that does not exist, the source NG-RAN node shall ignore the message.

8.4.9 Uplink RAN Early Status Transfer

8.4.9.1 General

The purpose of the Uplink RAN Early Status Transfer procedure is to transfer the COUNT of the first downlink SDU that the source NG-RAN node forwards to the target NG-RAN node, from the source NG-RAN node to the target NG-RAN node via the AMF during NG DAPS Handover. The procedure uses UE-associated signalling.

8.4.9.2 Successful Operation

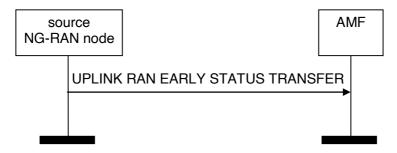


Figure 8.4.9.2-1: Uplink RAN Early Status Transfer

The source NG-RAN node initiates the procedure by sending the UPLINK RAN EARLY STATUS TRANSFER message to the AMF when it considers at least a DRB to be simultaneously served by the source and the target NG-RAN nodes during NG DAPS Handover.

For each DRB for which DAPS Handover applies, the source NG-RAN node shall include the *DRB ID* IE and the *FIRST DL COUNT Value* IE within the *DRBs Subject To Early Status Transfer Item* IE in the *Early Status Transfer Transparent Container* IE of the UPLINK RAN EARLY STATUS TRANSFER message.

8.4.9.3 Abnormal Conditions

Void.

8.4.10 Downlink RAN Early Status Transfer

8.4.10.1 General

The purpose of the Downlink RAN Early Status Transfer procedure is to transfer the COUNT of the first downlink SDU that the source NG-RAN node forwards to the target NG-RAN node, from the source NG-RAN node to the target NG-RAN node via the AMF during NG DAPS Handover. The procedure uses UE-associated signalling.

8.4.10.2 Successful Operation

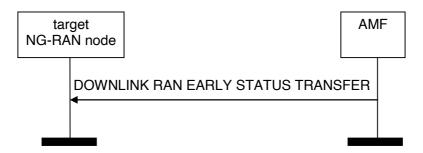


Figure 8.4.10.2-1: Downlink RAN Early Status Transfer

The AMF initiates the procedure by sending the DOWNLINK RAN EARLY STATUS TRANSFER message to the target NG-RAN node.

For each DRB for which the *FIRST DL COUNT Value* IE is received in the DOWNLINK RAN EARLY STATUS TRANSFER message, the target NG-RAN node shall use it as the COUNT of the first downlink SDU that the source NG-RAN node forwards to the target NG-RAN node.

8.4.10.3 Abnormal Conditions

If the target NG-RAN node receives this message for a UE for which no prepared handover exists at the target NG-RAN node, the target NG-RAN node shall ignore the message.

8.5 Paging Procedures

8.5.1 Paging

8.5.1.1 General

The purpose of the Paging procedure is to enable the AMF to page a UE in the specific NG-RAN node.

8.5.1.2 Successful Operation



Figure 8.5.1.2-1: Paging

The AMF initiates the Paging procedure by sending the PAGING message to the NG-RAN node.

At the reception of the PAGING message, the NG-RAN node shall perform paging of the UE in cells which belong to tracking areas as indicated in the *TAI List for Paging* IE.

If the *Paging DRX* IE is included in the PAGING message, the NG-RAN node shall use it according to TS 38.304 [12] and TS 36.304 [29].

For each cell that belongs to any of the tracking areas indicated in the *TAI List for Paging* IE, the NG-RAN node shall generate one page on the radio interface.

If the *Paging Priority* IE is included in the PAGING message, the NG-RAN node may use it according to TS 23.501 [9].

If the *UE Radio Capability for Paging* IE is included in the PAGING message, the NG-RAN node may use it to apply specific paging schemes.

If the Assistance Data for Recommended Cells IE is included in the Assistance Data for Paging IE it may be used, together with the Paging Attempt Information IE if also present, according to TS 38.300 [8].

If the *Next Paging Area Scope* IE is included in the *Paging Attempt Information* IE it may be used for paging the UE according to TS 38.300 [8].

If the *Paging Origin* IE is included in the PAGING message, the NG-RAN node shall transfer it to the UE according to TS 38.331 [18] and TS 36.331 [21].

If the *NB-IoT Paging eDRX Information* IE is included in the PAGING message, the NG-RAN node shall, if supported, use it according to TS 36.304 [29]. If the *NB-IoT Paging Time Window* IE is included in the *NB-IoT Paging eDRX Information* IE, the NG-RAN node shall take this information into account to determine the UE's paging occasion according to TS 36.304 [29]. The NG-RAN node should take into account the reception time of the PAGING message on the NG interface to determine when to page the UE.

If the *NB-IoT Paging DRX* IE is included in the PAGING message, the NG-RAN node shall use it according to TS 36.304 [29].

If the *Enhanced Coverage Restriction* IE is included in the PAGING message, the NG-RAN node shall, if supported, use it as defined in TS 23.501 [9].

If the *Paging Assistance Data for CE Capable UE* IE is included in the *Assistance Data for Paging* IE in the PAGING message, it may be used for paging the indicated CE capable UE, according to TS 36.300 [17].

If the WUS Assistance Information IE is included in the PAGING message, the NG-RAN node shall, if supported, use it to determine the WUS group for the UE, as specified in TS 36.304 [29].

If the *E-UTRA Paging eDRX Information* IE is included in the PAGING message, the NG-RAN node shall, if supported, use it according to TS 36.304 [29]. If the *E-UTRA Paging Time Window* IE is included in the *E-UTRA Paging eDRX Information* IE, the NG-RAN node shall take this information into account to determine the UE's paging occasion according to TS 36.304 [29]. The NG-RAN node should take into account the reception time of the PAGING message on the NGAP interface to determine when to page the UE.

If the *CE-mode-B Restricted* IE is included in the PAGING message and the *Enhanced Coverage Restriction* IE is not set to "restricted", the NG-RAN node shall, if supported, use it as defined in TS 23.501 [9].

If the NPN Paging Assistance Information IE is included in the Assistance Data for Paging IE, the NG-RAN node may take it into account when determining the cells where paging will be performed.

If the *NR Paging eDRX Information* IE is included in the PAGING message, the NG-RAN node shall, if supported, use it according to TS 38.304 [12] and TS 23.501 [9]. If the *NR Paging Time Window* IE is included in the *NR Paging eDRX Information* IE, the NG-RAN node shall take this information into account to determine the UE's paging occasion according to TS 38.304 [12].

If the *Paging Cause* IE is included in the PAGING message, the NG-RAN node shall, if supported, transfer it to the UE according to TS 38.331 [18] and TS 36.331 [21].

If the *PEIPS Assistance Information* IE is included in the PAGING message, the NG-RAN node shall, if supported, use it for paging subgrouping of the UE, as specified in TS 38.300 [8].

8.5.1.3 Abnormal Conditions

Void.

8.5.2 Multicast Group Paging

8.5.2.1 General

The purpose of the Multicast Group Paging procedure is to enable the AMF to notify CM-IDLE UEs which have joined an MBS session about its activation. The procedure uses non-UE associated signalling.

8.5.2.2 Successful Operation



Figure 8.5.2.2-1: Multicast Group Paging

The AMF initiates the Multicast Group Paging procedure by sending the MULTICAST GROUP PAGING message to the NG-RAN node.

At the reception of the MULTICAST GROUP PAGING message, the NG-RAN node shall perform multicast group paging of the MBS session identified by the MBS Session ID IE utilising information provided by the AMF.

If the *Paging DRX* IE is included in the MULTICAST GROUP PAGING message, the NG-RAN node shall use it according to TS 38.304 [12].

If the MBS Service Area IE is included in the MULTICAST GROUP PAGING message, the NG-RAN node shall take it into account during multicast group paging, as specified in TS 23.247 [44].

8.5.2.3 Abnormal Conditions

Void.

8.6 Transport of NAS Messages Procedures

8.6.1 Initial UE Message

8.6.1.1 General

The Initial UE Message procedure is used when the NG-RAN node has received from the radio interface the first uplink NAS message to be forwarded to an AMF.

8.6.1.2 Successful Operation



Figure 8.6.1.2-1: Initial UE message

The NG-RAN node initiates the procedure by sending an INITIAL UE MESSAGE message to the AMF. The NG-RAN node shall allocate a unique RAN UE NGAP ID to be used for the UE and the NG-RAN node shall include this identity in the INITIAL UE MESSAGE message.

The NAS-PDU IE contains a UE – AMF message that is transferred without interpretation in the NG-RAN node.

In case of network sharing, the selected PLMN is indicated by the *PLMN Identity* IE within the *TAI* IE included in the INITIAL UE MESSAGE message.

When the NG-RAN node has received from the radio interface the 5G-S-TMSI IE, it shall include it in the INITIAL UE MESSAGE message.

If the AMF Set ID IE is included in the INITIAL UE MESSAGE message this indicates that the message is a rerouted message and the AMF shall, if supported, use the IE as described in TS 23.502 [10].

If the *UE Context Request* IE is included in the INITIAL UE MESSAGE message the AMF shall trigger an Initial Context Setup procedure towards the NG-RAN node.

If the *Allowed NSSAI* IE is included in the INITIAL UE MESSAGE message the AMF shall use the IE as defined in TS 23.502 [10].

If the *Source to Target AMF Information Reroute* IE is included in the INITIAL UE MESSAGE message the AMF shall use the IE as defined in TS 23.502 [10].

If the *IAB Node Indication* IE is included in the INITIAL UE MESSAGE message, the AMF shall consider that the message is related to an IAB node.

If the *CE-mode-B Support Indicator* IE is included in the INITIAL UE MESSAGE message and set to "supported", the AMF shall, if supported, use the extended NAS timer settings for the UE as specified in TS 23.501 [9].

If the *LTE-M indication* IE is included in the INITIAL UE MESSAGE message the AMF shall, if supported, use it according to TS 23.501 [9].

If the *EDT Session* IE set to "true" is included in the INITIAL UE MESSAGE message and the NG-RAN node is an ng-eNB, the AMF shall, if supported, consider that the message has been received as a result of an EDT session initiated by the UE.

If PNI-NPN related information within the *NPN Access Information* IE is received in the INITIAL UE MESSAGE message, the AMF shall, if supported, consider that the included information is associated to the cell via which the UE has sent the first NAS message, and to the PLMN Identity which is indicated within the *TAI* IE, and use the included information as specified in TS 23.501 [9].

In case of network sharing for SNPNs, the selected SNPN is indicated within the *User Location Information* IE included in the INITIAL UE MESSAGE message by the *PLMN Identity* IE within the *TAI* IE and the *NID* IE.

If the *RedCap Indication* IE is included in the INITIAL UE MESSAGE message, the AMF shall, if supported, use it according to TS 23.501 [9].

8.6.1.3 Abnormal Conditions

If the 5G-S-TMSI is not received by the AMF in the INITIAL UE MESSAGE message whereas expected, the AMF shall consider the procedure as failed.

8.6.2 Downlink NAS Transport

8.6.2.1 General

The Downlink NAS Transport procedure is used when the AMF only needs to send a NAS message transparently via the NG-RAN node to the UE, and a UE-associated logical NG-connection exists for the UE or the AMF has received the *RAN UE NGAP ID* IE in an INITIAL UE MESSAGE message or if the NG-RAN node has already initiated a UE-associated logical NG-connection by sending an INITIAL UE MESSAGE message via another NG interface instance.

8.6.2.2 Successful Operation



Figure 8.6.2.2-1: Downlink NAS transport

The AMF initiates the procedure by sending a DOWNLINK NAS TRANSPORT message to the NG-RAN node. If the UE-associated logical NG-connection is not established, the AMF shall allocate a unique AMF UE NGAP ID to be used for the UE and include that in the DOWNLINK NAS TRANSPORT message; by receiving the *AMF UE NGAP ID* IE in the DOWNLINK NAS TRANSPORT message, the NG-RAN node establishes the UE-associated logical NG-connection.

If the *RAN Paging Priority* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node may use it to determine a priority for paging the UE in RRC_INACTIVE state.

The NAS-PDU IE contains an AMF – UE message that is transferred without interpretation in the NG-RAN node.

If the *Mobility Restriction List* IE is contained in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall overwrite any previously stored mobility restriction information in the UE context. The NG-RAN node shall use the information in the *Mobility Restriction List* IE if present in the DOWNLINK NAS TRANSPORT message to:

- determine a target for subsequent mobility action for which the NG-RAN node provides information about the target of the mobility action towards the UE;
- select a proper SCG during dual connectivity operation;
- assign proper RNA(s) for the UE when moving the UE to RRC_INACTIVE state.

If the *Mobility Restriction List* IE is not contained in the DOWNLINK NAS TRANSPORT message and there is no previously stored mobility restriction information, the NG-RAN node shall consider that no roaming and no access restriction apply to the UE.

If the *Index to RAT/Frequency Selection Priority* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall, if supported, use it as defined in TS 23.501 [9].

The *UE Aggregate Maximum Bit Rate* IE should be sent to the NG-RAN node if the AMF has not sent it previously. If it is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall store the UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].

If the *Old AMF* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall consider that this UE-associated logical NG-connection was redirected to this AMF from another AMF identified by the *Old AMF* IE.

If the *SRVCC Operation Possible* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall, if supported, store the content of the received *SRVCC Operation Possible* IE in the UE context and use it as defined in TS 23.216 [31].

If the *Extended Connected Time* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

If the *Enhanced Coverage Restriction* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

If the *CE-mode-B Restricted* IE is included in the DOWNLINK NAS TRANSPORT message and the *Enhanced Coverage Restriction* IE is not set to "restricted" and the Enhanced Coverage Restricted information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE Radio Capability* IE is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall store this information in the UE context, and use it as defined in TS 38.300 [8].

If the *End Indication* IE is included in the DOWNLINK NAS TRANSPORT message and set to "no further data", the NG-RAN node shall consider that besides the included NAS PDU in this message, there are no further NAS PDUs to be transmitted for this UE.

If the DOWNLINK NAS TRANSPORT message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

If the *Target NSSAI Information* IE is contained in the DOWNLINK NAS TRANSPORT message, the NG-RAN node may use this information as specified in TS 23.501 [9].

Interactions with Initial UE Message procedure:

The NG-RAN node shall use the AMF UE NGAP ID IE and RAN UE NGAP ID IE received in the DOWNLINK NAS TRANSPORT message as identification of the logical connection even if the RAN UE NGAP ID IE had been allocated in an INITIAL UE MESSAGE message sent over a different NG interface instance.

Interaction with the UE Radio Capability Info Indication procedure:

If the *UE Capability Info Request* IE set to "requested" is included in the DOWNLINK NAS TRANSPORT message, the NG-RAN node shall trigger the UE Radio Capability Info Indication procedure if UE capability related information was successfully retrieved from the UE.

8.6.2.3 Abnormal Conditions

Void.

8.6.3 Uplink NAS Transport

8.6.3.1 General

The Uplink NAS Transport procedure is used when the NG-RAN node has received from the radio interface a NAS message to be forwarded to the AMF to which a UE-associated logical NG-connection for the UE exists.

8.6.3.2 Successful Operation



Figure 8.6.3.2-1: Uplink NAS transport

The NG-RAN node initiates the procedure by sending an UPLINK NAS TRANSPORT message to the AMF.

The NAS-PDU IE contains a UE – AMF message that is transferred without interpretation in the NG-RAN node.

8.6.3.3 Abnormal Conditions

Void.

8.6.4 NAS Non Delivery Indication

8.6.4.1 General

The NAS Non Delivery Indication procedure is used when the NG-RAN node decides not to start the delivery of a NAS message that has been received over a UE-associated logical NG-connection or the NG-RAN node is unable to ensure that the message has been received by the UE.

8.6.4.2 Successful Operation



Figure 8.6.4.2-1: NAS non delivery indication

The NG-RAN node initiates the procedure by sending a NAS NON DELIVERY INDICATION message to the AMF. The NG-RAN node shall report the non-delivery of a NAS message by including the non-delivered NAS message within the *NAS-PDU* IE and an appropriate cause value within the *Cause* IE, e.g., "NG intra system handover triggered", "NG inter system handover triggered" or "Xn handover triggered".

8.6.4.3 Abnormal Conditions

Void.

8.6.5 Reroute NAS Request

8.6.5.1 General

The purpose of the Reroute NAS Request procedure is to enable the AMF to request for a rerouting of the INITIAL UE MESSAGE message to another AMF.

8.6.5.2 Successful Operation



Figure 8.6.5.2-1: Reroute NAS request

The AMF initiates the procedure by sending a REROUTE NAS REQUEST message to the NG-RAN node. The NG-RAN node shall, if supported, reroute the INITIAL UE MESSAGE message to an AMF indicated by the *AMF Set ID* IE as described in TS 23.501 [9].

If the *Allowed NSSAI* IE is included in the REROUTE NAS REQUEST message, then the NG-RAN node shall propagate it in the rerouted INITIAL UE MESSAGE message as defined in TS 23.502 [10].

If the *Source to Target AMF Information Reroute* IE is included in the REROUTE NAS REQUEST message, then the NG-RAN node shall propagate it in the rerouted INITIAL UE MESSAGE message as defined in TS 23.502 [10].

8.6.5.3 Abnormal Conditions

Void.

8.7 Interface Management Procedures

8.7.1 NG Setup

8.7.1.1 General

The purpose of the NG Setup procedure is to exchange application level data needed for the NG-RAN node and the AMF to correctly interoperate on the NG-C interface. This procedure shall be the first NGAP procedure triggered after the TNL association has become operational. The procedure uses non-UE associated signalling.

This procedure erases any existing application level configuration data in the two nodes, replaces it by the one received and clears AMF overload state information at the NG-RAN node. If the NG-RAN node and AMF do not agree on retaining the UE contexts this procedure also re-initialises the NGAP UE-related contexts (if any) and erases all related signalling connections in the two nodes like an NG Reset procedure would do.

8.7.1.2 Successful Operation

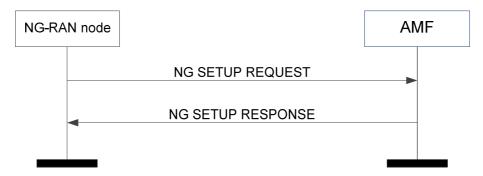


Figure 8.7.1.2-1: NG setup: successful operation

The NG-RAN node initiates the procedure by sending an NG SETUP REQUEST message including the appropriate data to the AMF. The AMF responds with an NG SETUP RESPONSE message including the appropriate data.

If the *Configured TAC Indication* IE set to "true" is included for a Tracking Area contained in the *Supported TA List* IE in the NG SETUP REQUEST message, the AMF may take it into account to optimise NG-C signalling towards this NG-RAN node.

If the *UE Retention Information* IE set to "ues-retained" is included in the NG SETUP REQUEST message, the AMF may accept the proposal to retain the existing UE related contexts and signalling connections by including the *UE Retention Information* IE set to "ues-retained" in the NG SETUP RESPONSE message.

If the AMF supports IAB, the AMF shall include the IAB Supported IE in the NG SETUP RESPONSE message.

The AMF shall include the *Backup AMF Name* IE, if available, in the *Served GUAMI List* IE in the NG SETUP RESPONSE message. The NG-RAN node shall, if supported, consider the AMF as indicated by the *Backup AMF Name* IE when performing AMF reselection, as specified in TS 23.501 [9].

If the *GUAMI Type* IE is included in the NG SETUP RESPONSE message, the NG-RAN node shall store the received value and use it for further AMF selection as defined in TS 23.501 [9].

If the *RAN Node Name* IE is included in the NG SETUP REQUEST message, the AMF may use this IE as a human readable name of the NG-RAN node. If the *Extended RAN Node Name* IE is included in the NG SETUP REQUEST message, the AMF may use this IE as a human readable name of the NG-RAN node and shall ignore the *RAN Node Name* IE if also included.

If the *AMF Name* IE is included in the NG SETUP RESPONSE message, the NG-RAN node may use this IE as a human readable name of the AMF. If the *Extended AMF Name* IE is included in the NG SETUP RESPONSE message, the NG-RAN node may use this IE as a human readable name of the AMF and shall ignore the *AMF Name* IE if also included.

If the NB-IoT Default Paging DRX IE is included in the NG SETUP REQUEST message, the AMF shall take it into account for paging.

If the *RAT Information* IE is included in the NG SETUP REQUEST message, the AMF shall handle this information as specified in TS 23.502 [10].

If the *NID* IE within the *NPN Support* IE is included within a *Broadcast PLMN Item* IE in the NG SETUP REQUEST message, the AMF shall consider that the NG-RAN node supports the indicated S-NSSAI(s) for the corresponding tracking area code for the SNPN identified by the *PLMN Identity* IE and the *NID* IE.

If the NID IE within the NPN Support IE is included within a PLMN Support Item IE in the NG SETUP RESPONSE message, the NG-RAN node shall consider that the AMF supports the SNPN identified by the PLMN Identity IE and the NID IE.

If the *Onboarding Support* IE is also included within the same *PLMN Support Item* IE, the NG-RAN node shall, if supported, consider that the AMF supports UE onboarding for the identified SNPN, as specified in TS 23.501 [9].

If the *TAI NSAG Support List* IE is included in the *Broadcast PLMN Item* IE in the NG SETUP REQUEST message, the AMF shall, if supported, use this information as specified in TS 23.501 [9].

8.7.1.3 Unsuccessful Operation



Figure 8.7.1.3-1: NG setup: unsuccessful operation

If the AMF cannot accept the setup, it should respond with an NG SETUP FAILURE message and appropriate cause value.

If the NG SETUP FAILURE message includes the *Time to Wait* IE, the NG-RAN node shall wait at least for the indicated time before reinitiating the NG Setup procedure towards the same AMF.

8.7.1.4 Abnormal Conditions

If the AMF does not identify any of the PLMNs/SNPNs indicated in the NG SETUP REQUEST message, it shall reject the NG Setup procedure with an appropriate cause value.

If none of the RATs indicated by the NG-RAN node in the NG SETUP REQUEST message is supported by the AMF, then the AMF shall fail the NG Setup procedure with an appropriate cause value.

8.7.2 RAN Configuration Update

8.7.2.1 General

The purpose of the RAN Configuration Update procedure is to update application level configuration data needed for the NG-RAN node and the AMF to interoperate correctly on the NG-C interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non UE-associated signalling.

8.7.2.2 Successful Operation

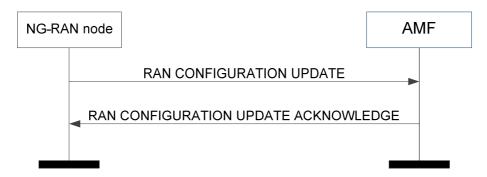


Figure 8.7.2.2-1: RAN configuration update: successful operation

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

If the *Supported TA List* IE is included in the RAN CONFIGURATION UPDATE message, the AMF shall overwrite the whole list of supported TAs and the corresponding list of supported slices for each TA, and use them for subsequent registration area management of the UE.

If the *Configured TAC Indication* IE set to "true" is included for a Tracking Area contained in the *Supported TA List* IE in the RAN CONFIGURATION UPDATE message, the AMF may take it into account to optimise NG-C signalling towards this NG-RAN node.

If the *Global RAN Node ID* IE is included in the RAN CONFIGURATION UPDATE message, the AMF shall associate the TNLA to the NG-C interface instance using the Global RAN Node ID.

If the RAN CONFIGURATION UPDATE message includes NG-RAN TNL Association to Remove List IE, and the Endpoint IP Address IE and the Port Number IE for both TNL endpoints of the TNL association(s) are included in the NG-RAN TNL Association to Remove List IE, the AMF shall, if supported, consider that the TNL association(s) indicated by both received TNL endpoints will be removed by the NG-RAN node. If the Endpoint IP Address IE, or the Endpoint IP Address IE and the Port Number IE for one or both of the TNL endpoints is included in the NG-RAN TNL Association to Remove List IE in RAN CONFIGURATION UPDATE message, the AMF shall, if supported, consider that the TNL association(s) indicated by the received endpoint IP address(es) will be removed by the NG-RAN node.

If the RAN CONFIGURATION UPDATE message includes the *RAN Node Name* IE, the AMF may store it or update this IE value if already stored, and use it as a human readable name of the NG-RAN node. If the RAN CONFIGURATION UPDATE message includes the *Extended RAN Node Name* IE, the AMF may store it or update this IE value if already stored, and use it as a human readable name of the NG-RAN node and shall ignore the *RAN Node Name* IE if also included.

If the *NB-IoT Default Paging DRX* IE is included in the RAN CONFIGURATION UPDATE message, the AMF shall overwrite any previously stored NB-IoT default paging DRX value for the NG-RAN node.

If the *RAT Information* IE is included in the RAN CONFIGURATION UPDATE message, the AMF shall handle this information as specified in TS 23.502 [10].

If the *NID* IE within the *NPN Support* IE is included within a *Broadcast PLMN Item* IE in the RAN CONFIGURATION UPDATE message, the AMF shall consider that the NG-RAN node supports the indicated S-NSSAI(s) for the corresponding tracking area code for the SNPN identified by the *PLMN Identity* IE and the *NID* IE.

If the *TAI NSAG Support List* IE is included in the *Broadcast PLMN Item* IE in the RAN CONFIGURATION UPDATE message, the AMF shall, if supported, use this information as specified in TS 23.501 [9].

8.7.2.3 Unsuccessful Operation



Figure 8.7.2.3-1: RAN configuration update: unsuccessful operation

If the AMF cannot accept the update, it shall respond with a RAN CONFIGURATION UPDATE FAILURE message and appropriate cause value.

If the *Time to Wait* IE is included in the RAN CONFIGURATION UPDATE FAILURE message, the NG-RAN node shall wait at least for the indicated time before reinitiating the RAN Configuration Update procedure towards the same AMF.

8.7.2.4 Abnormal Conditions

If the NG-RAN node, after initiating the RAN Configuration Update procedure, receives neither a RAN CONFIGURATION UPDATE ACKOWLEDGE nor a RAN CONFIGURATION UPDATE FAILURE message, the NG-RAN node may reinitiate a further RAN Configuration Update procedure towards the same AMF, provided that the content of the new RAN CONFIGURATION UPDATE message is identical to the content of the previously unacknowledged RAN CONFIGURATION UPDATE message.

8.7.3 AMF Configuration Update

8.7.3.1 General

The purpose of the AMF Configuration Update procedure is to update application level configuration data needed for the NG-RAN node and AMF to interoperate correctly on the NG-C interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non UE-associated signalling.

8.7.3.2 Successful Operation

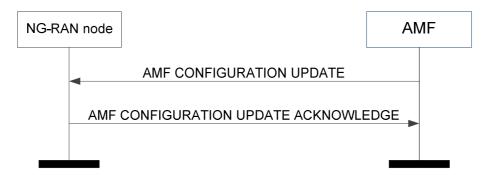


Figure 8.7.3.2-1: AMF configuration update: successful operation

The AMF initiates the procedure by sending an AMF CONFIGURATION UPDATE message including the appropriate updated configuration data to the NG-RAN node. The NG-RAN node responds with an AMF CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. Unless stated otherwise, if an information element is not included in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall interpret that the corresponding configuration data is not changed and shall continue to operate the NG-C interface with the existing related configuration data.

If the *PLMN Support List* IE is included in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall overwrite the whole list of supported PLMN/SNPN Identities and the corresponding list of AMF slices and, if present, other associated information for each PLMN/SNPN Identity and use the received values for further network slice selection and AMF selection.

If the AMF TNL Association to Add List IE is included in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall, if supported, use it to establish the TNL association(s) with the AMF. The NG-RAN node shall report to the AMF, in the AMF CONFIGURATION UPDATE ACKNOWLEDGE message, the successful establishment of the TNL association(s) with the AMF as follows:

- A list of successfully established TNL associations shall be included in the AMF TNL Association Setup List IE;
- A list of TNL associations that failed to be established shall be included in the AMF TNL Association Failed to Setup List IE.

If the AMF CONFIGURATION UPDATE message includes AMF TNL Association to Remove List IE, and the Endpoint IP Address and the Port Number IE for both TNL endpoints of the TNL association(s) is included in the AMF TNL Association to Remove List IE, the NG-RAN node shall, if supported, initiate removal of the TNL association(s) indicated by both received TNL endpoints towards the AMF. If the Endpoint IP Address IE, or the Endpoint IP Address IE and the Port Number IE for one or both of the TNL endpoints is included in the AMF TNL Association to Remove List IE, the NG-RAN node shall, if supported, initiate removal of the TNL association(s) indicated by the received endpoint IP address(es). If the AMF Name IE is included in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall overwrite the previously stored AMF name and use it to identify the AMF.

If the AMF CONFIGURATION UPDATE message includes the AMF Name IE, the NG-RAN node may store it or update this IE value if already stored, and use it as a human readable name of the AMF. If the AMF CONFIGURATION UPDATE message includes the Extended AMF Name IE, the NG-RAN node may store it or update this IE value if already stored, and use it as a human readable name of the AMF and shall ignore the AMF Name IE if also included.

If the *Served GUAMI List* IE is included in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall overwrite the whole list of GUAMIs served by the AMF by the new list and use the received values for further AMF management and AMF selection as defined in TS 23.501 [9].

If the *Relative AMF Capacity* IE is included in the AMF CONFIGURATION UPDATE message, the NG-RAN node may use it as defined in TS 23.501 [9].

If the AMF TNL Association to Update List IE is included in the AMF CONFIGURATION UPDATE message the NG-RAN node shall, if supported, update the TNL association(s) indicated by the received AMF Transport Layer information towards the AMF.

If the TNL Association Usage IE or the TNL Address Weight Factor IE is included in the AMF TNL Association to Add List IE or the AMF TNL Association to Update List IE, the NG-RAN node shall, if supported, consider it as defined in TS 23.502 [10].

If the *NID* IE within the *NPN Support* IE is included within a *PLMN Support Item* IE in the AMF CONFIGURATION UPDATE message, the NG-RAN node shall consider that the AMF supports the SNPN identified by the *PLMN Identity* IE and the *NID* IE.

If the *Onboarding Support* IE is also included within the same *PLMN Support Item* IE, the NG-RAN node shall, if supported, consider that the AMF supports UE onboarding for the identified SNPN, as specified in TS 23.501 [9].

8.7.3.3 Unsuccessful Operation



Figure 8.7.3.3-1: AMF configuration update: unsuccessful operation

If the NG-RAN node cannot accept the update, it shall respond with an AMF CONFIGURATION UPDATE FAILURE message and appropriate cause value.

If the *Time to Wait* IE is included in the AMF CONFIGURATION UPDATE FAILURE message, the AMF shall wait at least for the indicated time before reinitiating the AMF Configuration Update procedure towards the same NG-RAN node.

8.7.3.4 Abnormal Conditions

If the AMF receives neither an AMF CONFIGURATION UPDATE ACKOWLEDGE nor an AMF CONFIGURATION UPDATE FAILURE message, the AMF may reinitiate the AMF Configuration Update procedure towards the same NG-RAN node provided that the content of the new AMF CONFIGURATION UPDATE message is identical to the content of the previously unacknowledged AMF CONFIGURATION UPDATE message.

8.7.4 NG Reset

8.7.4.1 General

The purpose of the NG Reset procedure is to initialise or re-initialise the RAN, or part of RAN NGAP UE-related contexts, in the event of a failure in the 5GC or vice versa. This procedure does not affect the application level configuration data exchanged during, e.g., the NG Setup procedure. The procedure uses non-UE associated signalling.

8.7.4.2 Successful Operation

8.7.4.2.1 NG Reset initiated by the AMF



Figure 8.7.4.2.1-1: NG reset initiated by the AMF: successful operation

In the event of a failure at the AMF which has resulted in the loss of some or all transaction reference information, an NG RESET message shall be sent to the NG-RAN node.

At reception of the NG RESET message the NG-RAN node shall release all allocated resources on NG and Uu related to the UE association(s) indicated explicitly or implicitly in the NG RESET message and remove the indicated UE contexts including NGAP ID.

After the NG-RAN node has released all assigned NG resources and the UE NGAP IDs for all indicated UE associations which can be used for new UE-associated logical NG-connections over the NG interface, the NG-RAN node shall respond with the NG RESET ACKNOWLEDGE message. The NG-RAN node does not need to wait for the release of radio resources to be completed before returning the NG RESET ACKNOWLEDGE message.

If the NG RESET message contains the UE-associated Logical NG-connection List IE, then:

- The NG-RAN node shall use the AMF UE NGAP ID IE and/or the RAN UE NGAP ID IE to explicitly identify the UE association(s) to be reset.
- The NG-RAN node shall include in the NG RESET ACKNOWLEDGE message, for each UE association to be reset, the UE-associated Logical NG-connection Item IE in the UE-associated Logical NG-connection List IE. The UE-associated Logical NG-connection Item IEs shall be in the same order as received in the NG RESET message and shall include also unknown UE-associated logical NG-connections. Empty UE-associated Logical NG-connection Item IEs, received in the NG RESET message, may be omitted in the NG RESET ACKNOWLEDGE message.
- If the AMF UE NGAP ID IE is included in the UE-associated Logical NG-connection Item IE for a UE association, the NG-RAN node shall include the AMF UE NGAP ID IE in the corresponding UE-associated Logical NG-connection Item IE in the NG RESET ACKNOWLEDGE message.
- If the *RAN UE NGAP ID* IE is included in the *UE-associated Logical NG-connection Item* IE for a UE association, the NG-RAN node shall include the *RAN UE NGAP ID* IE in the corresponding *UE-associated Logical NG-connection Item* IE in the NG RESET ACKNOWLEDGE message.

Interactions with other procedures:

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

8.7.4.2.2 NG Reset initiated by the NG-RAN node

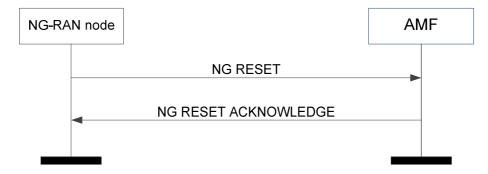


Figure 8.7.4.2.2-1: NG reset initiated by the NG-RAN node: successful operation

In the event of a failure at the NG-RAN node which has resulted in the loss of some or all transaction reference information, an NG RESET message shall be sent to the AMF.

At reception of the NG RESET message the AMF shall release all allocated resources on NG related to the UE association(s) indicated explicitly or implicitly in the NG RESET message and remove the NGAP ID for the indicated UE associations.

After the AMF has released all assigned NG resources and the UE NGAP IDs for all indicated UE associations which can be used for new UE-associated logical NG-connections over the NG interface, the AMF shall respond with the NG RESET ACKNOWLEDGE message.

If the NG RESET message contains the UE-associated Logical NG-connection List IE, then:

- The AMF shall use the AMF UE NGAP ID IE and/or the RAN UE NGAP ID IE to explicitly identify the UE association(s) to be reset.
- The AMF shall include in the NG RESET ACKNOWLEDGE message, for each UE association to be reset, the UE-associated Logical NG-connection Item IE in the UE-associated Logical NG-connection List IE. The UE-associated Logical NG-connection Item IEs shall be in the same order as received in the NG RESET message and shall include also unknown UE-associated logical NG-connections. Empty UE-associated Logical NG-connection Item IEs, received in the NG RESET message, may be omitted in the NG RESET ACKNOWLEDGE message.
- If the AMF UE NGAP ID IE is included in the UE-associated Logical NG-connection Item IE for a UE association, the AMF shall include the AMF UE NGAP ID IE in the corresponding UE-associated Logical NG-connection Item IE in the NG RESET ACKNOWLEDGE message.
- If the RAN UE NGAP ID IE is included in a UE-associated Logical NG-connection Item IE for a UE association, the AMF shall include the RAN UE NGAP ID IE in the corresponding UE-associated Logical NG-connection Item IE in the NG RESET ACKNOWLEDGE message.

Interactions with other procedures:

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

8.7.4.3 Unsuccessful Operation

Not applicable.

8.7.4.4 Abnormal Conditions

8.7.4.4.1 Abnormal Condition at the 5GC

If the NG RESET message includes the *UE-associated Logical NG-connection List* IE, but neither the *AMF UE NGAP ID* IE nor the *RAN UE NGAP ID* IE is present for a *UE-associated Logical NG-connection Item* IE, then the AMF shall ignore the *UE-associated Logical NG-connection Item* IE. The AMF may return the empty *UE-associated Logical NG-connection Item* IE in the *UE-associated Logical NG-connection List* IE in the NG RESET ACKNOWLEDGE message.

8.7.4.4.2 Abnormal Condition at the NG-RAN

If the NG RESET message includes the *UE-associated Logical NG-connection List* IE, but neither the *AMF UE NGAP ID* IE nor the *RAN UE NGAP ID* IE is present for a *UE-associated Logical NG-connection Item* IE, then the NG-RAN node shall ignore the *UE-associated Logical NG-connection Item* IE. The NG-RAN node may return the empty *UE-associated Logical NG-connection Item* IE in the *UE-associated Logical NG-connection List* IE in the NG RESET ACKNOWLEDGE message.

8.7.4.4.3 Crossing of NG RESET Messages

If an NG Reset procedure is ongoing in the NG-RAN node and the NG-RAN node receives an NG RESET message from the peer entity on the same NG interface related to one or several UE associations previously requested to be reset, indicated explicitly or implicitly in the received NG RESET message, the NG-RAN node shall respond with the NG RESET ACKNOWLEDGE message as described in 8.7.4.2.1.

If an NG Reset procedure is ongoing in the AMF and the AMF receives an NG RESET message from the peer entity on the same NG interface related to one or several UE associations previously requested to be reset, indicated explicitly or implicitly in the received NG RESET message, the AMF shall respond with the NG RESET ACKNOWLEDGE message as described in 8.7.4.2.2.

8.7.5 Error Indication

8.7.5.1 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.

8.7.5.2 Successful Operation



Figure 8.7.5.2-1: Error indication initiated by the AMF



Figure 8.7.5.2-2: Error indication initiated by the NG-RAN node

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 *AMF UE NGAP ID* IE and the *RAN UE NGAP ID* IE shall be included in the ERROR INDICATION message. If one or both of the *AMF UE NGAP ID* IE and the *RAN UE NGAP ID* IE are not correct, the cause shall be set to an appropriate value, e.g., "Unknown local UE NGAP ID" or "Inconsistent remote UE NGAP ID".

8.7.5.3 Abnormal Conditions

Void.

8.7.6 AMF Status Indication

8.7.6.1 General

The purpose of the AMF Status Indication procedure is to support AMF management functions. The procedure uses non UE-associated signalling.

8.7.6.2 Successful Operation



Figure 8.7.6.2-1: AMF status indication

The AMF initiates the procedure by sending an AMF STATUS INDICATION message to the NG-RAN node.

Upon receipt of the AMF STATUS INDICATION message, the NG-RAN node shall consider the indicated GUAMI(s) will be unavailable and perform AMF reselection as defined in TS 23.501 [9].

The NG-RAN node shall, if supported, act accordingly as specified in TS 23.501 [9], based on the presence or absence of the *Timer Approach for GUAMI Removal* IE.

If the *Backup AMF Name* IE is included in the AMF STATUS INDICATION message, the NG-RAN node shall, if supported, perform AMF reselection considering the AMF as indicated by the *Backup AMF Name* IE as specified in TS 23.501 [9].

8.7.6.3 Abnormal Conditions

Void.

8.7.7 Overload Start

8.7.7.1 General

The purpose of the Overload Start procedure is to inform an NG-RAN node to reduce the signalling load towards the concerned AMF. The procedure uses non-UE associated signalling.

8.7.7.2 Successful Operation



Figure 8.7.7.2-1: Overload start

The NG-RAN node receiving the OVERLOAD START message shall assume the AMF from which it receives the message as being in an overloaded state.

If the *Overload Action* IE is included the *AMF Overload Response* IE within the OVERLOAD START message, the NG-RAN node shall use it to identify the related signalling traffic. When the *Overload Action* IE is set to

- "reject RRC connection establishments for non-emergency mobile originated data transfer" (i.e., reject traffic corresponding to RRC cause "mo-data", "mo-SMS", "mo-VideoCall" and "mo-VoiceCall" in TS 38.331 [18] or "mo-data" and "mo-VoiceCall" in TS 36.331 [21]), or
- "reject RRC connection establishments for signalling" (i.e., reject traffic corresponding to RRC cause "mo-data", "mo-SMS", "mo-signalling", "mo-VideoCall" and "mo-VoiceCall" in TS 38.331 [18] or "mo-data", "mo-signalling" and "mo-VoiceCall" in TS 36.331 [21]), or
- "only permit RRC connection establishments for emergency sessions and mobile terminated services" (i.e., only permit traffic corresponding to RRC cause "emergency" and "mt-Access" in TS 38.331 [18] or in TS 36.331 [21]), or
- "only permit RRC connection establishments for high priority sessions and mobile terminated services" (i.e., only permit traffic corresponding to RRC cause "highPriorityAccess", "mps-PriorityAccess", "mcs-PriorityAccess" and "mt-Access" in TS 38.331 [18] or "highPriorityAccess", "mo-ExceptionData" and "mt-Access" in TS 36.331 [21]),

the NG-RAN node shall:

- if the AMF Traffic Load Reduction Indication IE is included in the OVERLOAD START message, reduce the signalling traffic by the indicated percentage,
- otherwise ensure that only the signalling traffic not indicated as to be rejected is sent to the AMF.

If the Overload Start NSSAI List IE is included in the OVERLOAD START message, the NG-RAN node shall:

- if the *Slice Traffic Load Reduction Indication* IE is present, reduce the signalling traffic by the indicated percentage for the UE(s) whose requested NSSAI only include S-NSSAI(s) contained in the *Overload Start NSSAI List* IE, and the signalling traffic indicated as to be reduced by the *Overload Action* IE in the *Slice Overload Response* IE if the IE is present,
- otherwise ensure that only the signalling traffic from UE(s) whose requested NSSAI includes S-NSSAI(s) other than the ones contained in the *Overload Start NSSAI List* IE, or the signalling traffic not indicated as to be reduced by the *Overload Action* IE in the *Slice Overload Response* IE for the UE(s) if the requested NSSAI matched, is sent to the AMF.

If an overload control is ongoing and the NG-RAN node receives a further OVERLOAD START message, the NG-RAN node shall replace the contents of the previously received information with the new one.

8.7.7.3 Abnormal Conditions

Void.

8.7.8 Overload Stop

8.7.8.1 General

The purpose of the Overload Stop procedure is to signal to an NG-RAN node the AMF is connected to that the overload situation at the AMF has ended and normal operation shall resume. The procedure uses non-UE associated signalling.

8.7.8.2 Successful Operation



Figure 8.7.8.2-1: Overload stop

The NG-RAN node receiving the OVERLOAD STOP message shall assume that the overload situation at the AMF from which it receives the message has ended and shall resume normal operation for the applicable traffic towards this AMF.

8.7.8.3 Abnormal Conditions

Void.

8.8 Configuration Transfer Procedures

8.8.1 Uplink RAN Configuration Transfer

8.8.1.1 General

The purpose of the Uplink RAN Configuration Transfer procedure is to transfer RAN configuration information from the NG-RAN node to the AMF. The AMF does not interpret the transferred RAN configuration information. This procedure uses non-UE associated signalling.

8.8.1.2 Successful Operation



Figure 8.8.1.2-1: Uplink RAN configuration transfer

The NG-RAN node initiates the procedure by sending the UPLINK RAN CONFIGURATION TRANSFER message to the AMF.

If the AMF receives the SON Configuration Transfer IE, it shall transparently transfer the SON Configuration Transfer IE towards the NG-RAN node indicated in the Target RAN Node ID IE which is included in the SON Configuration Transfer IE. If the NG-RAN CGI IE is included within the Target RAN Node ID IE, the AMF shall, if supported, ignore the Global RAN Node ID IE within the Target RAN Node ID IE, and use it to identify the target gNB as described in TS 38.300 [8].

If the AMF receives the *EN-DC SON Configuration Transfer* IE, it shall transparently transfer the *EN-DC SON Configuration Transfer* IE towards an MME serving the eNB indicated in the *Target eNB-ID* IE which is included in the *EN-DC SON Configuration Transfer* IE.

If the AMF receives the *Inter-system SON Configuration Transfer* IE, it shall transparently transfer the *Inter-system SON Configuration Transfer* IE towards an MME serving the eNB indicated in the *Target eNB-ID* IE which is included in the *Inter-system SON Configuration Transfer* IE.

8.8.1.3 Abnormal Conditions

Void.

8.8.2 Downlink RAN Configuration Transfer

8.8.2.1 General

The purpose of the Downlink RAN Configuration Transfer procedure is to transfer RAN configuration information from the AMF to the NG-RAN node. This procedure uses non-UE associated signalling.

8.8.2.2 Successful Operation



Figure 8.8.2.2-1: Downlink RAN configuration transfer

The procedure is initiated with an DOWNLINK RAN CONFIGURATION TRANSFER message sent from the AMF to the NG-RAN node.

If the NG-RAN node receives, in the SON Configuration Transfer IE or in the EN-DC SON Configuration Transfer IE, the SON Information IE containing the SON Information Request IE, it may transfer back the requested information either towards the NG-RAN node indicated in the Source RAN Node ID IE of the SON Configuration Transfer IE or towards an eNB indicated in the Source eNB-ID IE of the EN-DC SON Configuration Transfer IE by initiating the Uplink RAN Configuration Transfer procedure.

If the NG-RAN node receives, in the SON Configuration Transfer IE, the Xn TNL Configuration Info IE containing the Xn Extended Transport Layer Addresses IE, it may use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If the NG-RAN node receives, in the SON Configuration Transfer IE, the SON Information IE containing the SON Information Reply IE including the Xn TNL Configuration Info IE as an answer to a former request, it may use it to initiate the Xn TNL establishment.

In case the *IP-Sec Transport Layer Address* IE is present and the *GTP Transport Layer Addresses* IE within the *Xn Extended Transport Layer Addresses* IE is not empty, GTP traffic is conveyed within an IP-Sec tunnel terminated at the IP-Sec tunnel endpoint given in the *IP-Sec Transport Layer Address* IE.

In case the *IP-Sec Transport Layer Address* IE is not present, GTP traffic is terminated at the endpoints given by the list of addresses in the *Xn GTP Transport Layer Addresses* IE within the *Xn Extended Transport Layer Addresses* IE.

In case the Xn GTP Transport Layer Addresses IE is empty and the IP-Sec Transport Layer Address IE is present, SCTP traffic is conveyed within an IP-Sec tunnel terminated at the IP-Sec tunnel endpoint given in the IP-Sec Transport Layer Address IE, within the Xn Extended Transport Layer Addresses IE.

In case the *Xn SCTP Transport Layer Addresses* IE is present and the *IP-Sec Transport Layer Address* IE is also present, the concerned SCTP traffic is conveyed within an IP-Sec tunnel terminated at the IP-Sec tunnel endpoint given in this *IP-Sec Transport Layer Addresses* IE, within the *Xn Extended Transport Layer Addresses* IE.

If the NG-RAN node receives the *SON Information* IE containing the *SON Information Report* IE it may use it as specified in TS 38.300 [8].

If the NG-RAN node receives the *Inter-system SON Information* IE containing the *Inter-system SON Information Report* IE it may use it as specified in TS 38.300 [8].

If the NG-RAN node receives the *Inter-system SON Information* IE containing the *Inter-system SON Information Request* IE or the *Inter-system SON Information Reply* IE, it may use it as specified in TS 38.300 [8].

If the NG-RAN node is configured to use one IPsec tunnel for all NG and Xn traffic (IPsec star topology) then the traffic to the peer NG-RAN node shall be routed through this IPsec tunnel and the *IP-Sec Transport Layer Address* IE shall be ignored.

8.8.2.3 Abnormal Conditions

Void.

8.9 Warning Message Transmission Procedures

8.9.1 Write-Replace Warning

8.9.1.1 General

The purpose of Write-Replace Warning procedure is to start or overwrite the broadcasting of warning messages. The procedure uses non UE-associated signalling.

8.9.1.2 Successful Operation



Figure 8.9.1.2-1: Write-Replace Warning procedure: successful operation

The AMF initiates the procedure by sending a WRITE-REPLACE WARNING REQUEST message to the NG-RAN node.

Upon receipt of the WRITE-REPLACE WARNING REQUEST message, the NG-RAN node shall prioritise its resources to process the warning message.

If, in a certain area, broadcast of a warning message is already ongoing and the NG-RAN node receives a WRITE-REPLACE WARNING REQUEST message with *Message Identifier* IE and/or *Serial Number* IE which are different from those in the warning message being broadcast, and if the *Concurrent Warning Message Indicator* IE is not present, the NG-RAN node shall replace the warning message being broadcast with the newly received one for that area.

If the NG-RAN node receives a WRITE-REPLACE WARNING REQUEST message with a warning message identified by the *Message Identifier* IE and *Serial Number* IE and if there are no prior warning messages being broadcast in any of the warning areas indicated in the *Warning Area List* IE, the NG-RAN node shall broadcast the received warning message for those area(s).

If, in a certain area, broadcast of one or more warning messages are already ongoing and the NG-RAN node receives a WRITE-REPLACE WARNING REQUEST message with a *Message Identifier* IE and/or *Serial Number* IE which are different from those in any of the warning messages being broadcast, and if the *Concurrent Warning Message Indictor* IE is present, the NG-RAN node shall schedule the received warning message for broadcast, for that area.

If the *Concurrent Warning Message Indicator* IE is present and if a value "0" is received in the *Number of Broadcasts Requested* IE, the NG-RAN node shall broadcast the received warning message indefinitely until requested otherwise to stop broadcasting, except if the *Repetition Period* IE is set to "0".

If, in a certain area, broadcast of one or more warning messages are already ongoing and the NG-RAN node receives a WRITE-REPLACE WARNING REQUEST message with *Message Identifier* IE and *Serial Number* IE which correspond to one of the warning messages already being broadcast in that area, the NG-RAN node shall not start a new broadcast or replace an existing one but it shall still reply by sending a WRITE-REPLACE WARNING RESPONSE message which includes the *Broadcast Completed Area List* IE set according to the ongoing broadcast.

If the *Warning Area List* IE is not included in the WRITE-REPLACE WARNING REQUEST message, the NG-RAN node shall broadcast the indicated message in all of the cells within the NG-RAN node.

If the *Warning Type* IE is included in the WRITE-REPLACE WARNING REQUEST message, the NG-RAN node shall broadcast the Primary Notification irrespective of the setting of the *Repetition Period* IE and the *Number of Broadcasts Requested* IE, and process the Primary Notification according to TS 36.331 [21] and TS 38.331 [18].

If the *Data Coding Scheme* IE and the *Warning Message Contents* IE are both included in the WRITE-REPLACE WARNING REQUEST message, the NG-RAN node shall schedule a broadcast of the warning message according to the value of the *Repetition Period* IE and the *Number of Broadcasts Requested* IE and process the warning message according to TS 36.331 [21] and TS 38.331 [18].

If the *Warning Area Coordinates* IE is included in the WRITE-REPLACE WARNING REQUEST message, the NG-RAN node shall include this information together with the warning message being broadcast according to TS 36.331 [21] and TS 38.331 [18].

The NG-RAN node acknowledges the WRITE-REPLACE WARNING REQUEST message by sending a WRITE-REPLACE WARNING RESPONSE message to the AMF.

If the *Broadcast Completed Area List* IE is not included in the WRITE-REPLACE WARNING RESPONSE message, the AMF shall consider that the broadcast is unsuccessful in all the cells within the NG-RAN node.

8.9.1.3 Unsuccessful Operation

Not applicable.

8.9.1.4 Abnormal Conditions

If the Concurrent Warning Message Indicator IE is not present and if a value "0" is received in the Number of Broadcasts Requested IE, the NG-RAN node shall not broadcast the received secondary notification.

If the *Concurrent Warning Message Indicator* IE is included and if a value "0" is received in the *Repetition Period* IE, the NG-RAN node shall not broadcast the received warning message except if the *Number of Broadcasts Requested* IE is set to "1".

If the *Concurrent Warning Message Indicator* IE is not included and if a value "0" is received in the *Repetition Period* IE, the NG-RAN node shall not broadcast the received secondary notification except if the *Number of Broadcasts Requested* IE is set to "1".

8.9.2 PWS Cancel

8.9.2.1 General

The purpose of the PWS Cancel procedure is to cancel an already ongoing broadcast of a warning message. The procedure uses non UE-associated signalling.

8.9.2.2 Successful Operation

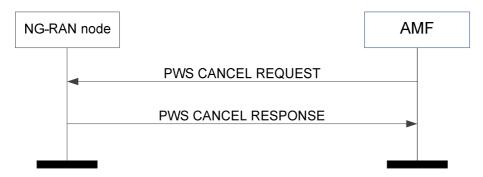


Figure 8.9.2.2-1: PWS Cancel procedure: successful operation

The AMF initiates the procedure by sending a PWS CANCEL REQUEST message to the NG-RAN node.

If the NG-RAN node receives a PWS CANCEL REQUEST message and broadcast of the warning message identified by the *Message Identifier* and *Serial Number* IE is ongoing in an area indicated within the *Warning Area List* IE, the NG-RAN node shall stop broadcasting the warning message within that area and discard the warning message for that area.

If the Warning Area List IE is not included in the PWS CANCEL REQUEST message, the NG-RAN node shall stop broadcasting and discard the warning message identified by the Message Identifier IE and the Serial Number IE in all of the cells in the NG-RAN node.

The NG-RAN node shall acknowledge the PWS CANCEL REQUEST message by sending the PWS CANCEL RESPONSE message, with the *Message Identifier* IE and the *Serial Number* IE copied from the PWS CANCEL REQUEST message and shall, if there is an area to report where an ongoing broadcast was stopped successfully, include the *Broadcast Cancelled Area List* IE.

If an area included in the Warning Area List IE in the PWS CANCEL REQUEST message does not appear in the Broadcast Cancelled Area List IE, the AMF shall consider that the NG-RAN node had no ongoing broadcast to stop for the same Message Identifier and Serial Number in that area.

If the *Broadcast Cancelled Area List* IE is not included in the PWS CANCEL RESPONSE message, the AMF shall consider that the NG-RAN node had no ongoing broadcast to stop for the same *Message Identifier* and *Serial Number*.

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

8.9.2.3 Unsuccessful Operation

Not applicable.

8.9.2.4 Abnormal Conditions

Void.

8.9.3 PWS Restart Indication

8.9.3.1 General

The purpose of the PWS Restart Indication procedure is to inform the AMF that PWS information for some or all cells of the NG-RAN node may be reloaded from the CBC if needed. The procedure uses non UE-associated signalling.

8.9.3.2 Successful Operation



Figure 8.9.3.2-1: PWS restart indication

The NG-RAN node initiates the procedure by sending a PWS RESTART INDICATION message to the AMF. On receipt of a PWS RESTART INDICATION message, the AMF shall act as defined in TS 23.007 [20].

If the Emergency Area ID is available, the NG-RAN node shall also include it in the *Emergency Area ID List for Restart* IE.

8.9.3.3 Abnormal Conditions

Void.

8.9.4 PWS Failure Indication

8.9.4.1 General

The purpose of the PWS Failure Indication procedure is to inform the AMF that ongoing PWS operation for one or more cells of the NG-RAN node has failed. The procedure uses non UE-associated signalling.

8.9.4.2 Successful Operation

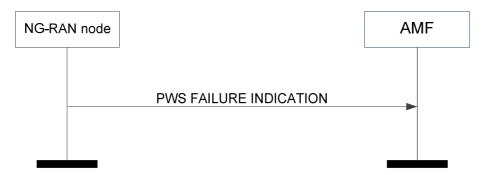


Figure 8.9.4.2-1: PWS failure indication

The NG-RAN node initiates the procedure by sending a PWS FAILURE INDICATION message to the AMF. On receipt of a PWS FAILURE INDICATION message, the AMF shall act as defined in TS 23.041 [22].

8.9.4.3 Abnormal Conditions

Void.

8.10 NRPPa Transport Procedures

8.10.1 General

The purpose of the NRPPa Transport procedures is to carry NRPPa signalling (defined in TS 38.455 [19]) between the NG-RAN node and the LMF over the NG interface.

The Downlink UE Associated NRPPa Transport procedure and the Uplink UE Associated NRPPa Transport procedure use UE-associated signalling. The UE-associated signalling is used to support E-CID Location Information Transfer, Positioning Information Transfer, Measurement Preconfiguration Information Transfer, and Reporting of General Error Situations due to reception of an NRPPa message that utilized UE-associated signalling.

The Downlink Non UE Associated NRPPa Transport procedure and the Uplink Non UE Associated NRPPa Transport procedure use non-UE associated signalling. The non-UE associated signalling is used to support OTDOA Information Transfer, Assistance Information Transfer, TRP Information Transfer, Measurement Information Transfer, PRS Information Transfer, and Reporting of General Error Situations due to reception of an NRPPa message that utilized non-UE associated signalling.

8.10.2 Successful Operations

8.10.2.1 DOWNLINK UE ASSOCIATED NRPPA TRANSPORT

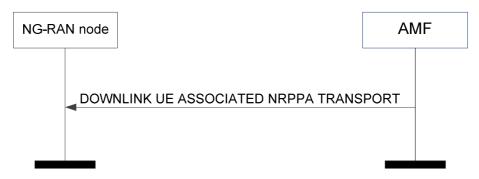


Figure 8.10.2.1-1: Downlink UE-associated NRPPa transport

The AMF initiates the procedure by sending the DOWNLINK UE ASSOCIATED NRPPA TRANSPORT message to the NG-RAN node.

8.10.2.2 UPLINK UE ASSOCIATED NRPPA TRANSPORT

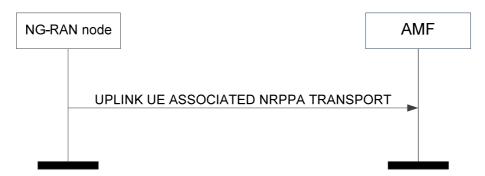


Figure 8.10.2.2-1: Uplink UE-associated NRPPa transport

The NG-RAN node initiates the procedure by sending the UPLINK UE ASSOCIATED NRPPA TRANSPORT message to the AMF.

8.10.2.3 DOWNLINK NON UE ASSOCIATED NRPPA TRANSPORT



Figure 8.10.2.3-1: Downlink non UE-associated NRPPa transport

The AMF initiates the procedure by sending the DOWNLINK NON UE ASSOCIATED NRPPA TRANSPORT message to the NG-RAN node.

8.10.2.4 UPLINK NON UE ASSOCIATED NRPPA TRANSPORT

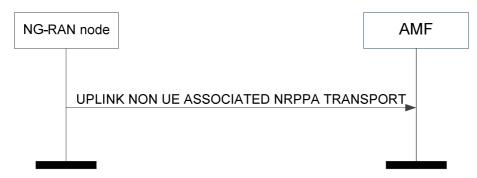


Figure 8.10.2.4-1: Uplink non UE-associated NRPPa transport

The NG-RAN node initiates the procedure by sending the UPLINK NON UE ASSOCIATED NRPPA TRANSPORT message to the AMF.

8.10.3 Unsuccessful Operations

Not applicable.

8.10.4 Abnormal Conditions

If an AMF receives an UPLINK UE ASSOCIATED NRPPA TRANSPORT message with an unknown Routing ID for the UE, the AMF shall ignore the message.

If an AMF receives an UPLINK NON UE ASSOCIATED NRPPA TRANSPORT message indicating an unknown or unreachable Routing ID, the AMF shall ignore the message.

8.11 Trace Procedures

8.11.1 Trace Start

8.11.1.1 General

The purpose of the Trace Start procedure is to allow the AMF to request the NG-RAN node to initiate a trace session for a UE. The procedure uses UE-associated signalling. If no UE-associated logical NG-connection exists, the UE-associated logical NG-connection shall be established as part of the procedure.

8.11.1.2 Successful Operation



Figure 8.11.1.2-1: Trace start

The AMF initiates the procedure by sending a TRACE START message. Upon reception of the TRACE START message, the NG-RAN node shall initiate the requested trace session as described in TS 32.422 [11].

If the *Trace Activation* IE is included in the TRACE START message which includes the *MDT Activation* IE set to "Immediate MDT and Trace", the NG-RAN node shall, if supported, initiate the requested trace session and MDT session as described in TS 32.422 [11].

If the *Trace Activation* IE is included in the TRACE START message which includes the *MDT Activation* IE set to "Immediate MDT Only", "Logged MDT only", the NG-RAN node shall, if supported, initiate the requested MDT session as described in TS 32.422 [11] and the NG-RAN node shall ignore the *Interfaces To Trace* IE and the *Trace Depth* IE.

If the *Trace Activation* IE includes the *MDT Location Information* IE within the *MDT Configuration* IE, the NG-RAN node shall, if supported, store this information and take it into account in the requested MDT session.

If the *Trace Activation* IE is included in the TRACE START message which includes the *MDT Activation* IE set to "Immediate MDT Only", "Logged MDT only" and if the *Signalling Based MDT PLMN List* IE is included in the *MDT Configuration* IE, the NG-RAN node may use it to propagate the MDT Configuration as described in TS 37.320 [41].

If the *Trace Activation* IE includes the *Bluetooth Measurement Configuration* IE within the *MDT Configuration* IE, the NG-RAN node shall, if supported, take it into account for MDT Configuration as described in TS 37.320 [41].

If the *Trace Activation* IE includes the *WLAN Measurement Configuration* IE within the *MDT Configuration* IE, the NG-RAN node shall, if supported, take it into account for MDT Configuration as described in TS 37.320 [41].

If the *Trace Activation* IE includes the *Sensor Measurement Configuration* IE within the *MDT Configuration* IE, the NG-RAN node shall, if supported, take it into account for MDT Configuration as described in TS 37.320 [41].

If the *Trace Activation* IE includes the *MDT Configuration* IE and if the NG-RAN node is a gNB at least the *MDT Configuration-NR* IE shall be present, while if the NG-RAN node is an ng-eNB at least the *MDT Configuration-EUTRA* IE shall be present.

Interactions with other procedures:

If the NG-RAN node is not able to initiate the trace session due to ongoing handover of the UE to another NG-RAN node, the NG-RAN node shall initiate a Trace Failure Indication procedure with the appropriate cause value.

8.11.1.3 Abnormal Conditions

Void.

8.11.2 Trace Failure Indication

8.11.2.1 General

The purpose of the Trace Failure Indication procedure is to allow the NG-RAN node to inform the AMF that a Trace Start procedure or a Deactivate Trace procedure has failed due to an interaction with a handover procedure. The procedure uses UE-associated signalling.

8.11.2.2 Successful Operation



Figure 8.11.2.2-1: Trace failure indication

The NG-RAN node initiates the procedure by sending a TRACE FAILURE INDICATION message. Upon reception of the TRACE FAILURE INDICATION message, the AMF shall take appropriate actions based on the failure reason indicated by the *Cause* IE.

8.11.2.3 Abnormal Conditions

Void.

8.11.3 Deactivate Trace

8.11.3.1 General

The purpose of the Deactivate Trace procedure is to allow the AMF to request the NG-RAN node to stop the trace session for the indicated trace reference. The procedure uses UE-associated signalling.

8.11.3.2 Successful Operation



Figure 8.11.3.2-1: Deactivate trace

The AMF initiates the procedure by sending a DEACTIVATE TRACE message to the NG-RAN node as described in TS 32.422 [11]. Upon reception of the DEACTIVATE TRACE message, the NG-RAN node shall stop the trace session for the indicated trace reference in the *NG-RAN Trace ID* IE.

Interactions with other procedures:

If the NG-RAN node is not able to stop the trace session due to ongoing handover of the UE to another NG-RAN node, the NG-RAN node shall initiate a Trace Failure Indication procedure with the appropriate cause value.

8.11.3.3 Abnormal Conditions

Void.

8.11.4 Cell Traffic Trace

8.11.4.1 General

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

8.11.4.2 Successful Operation



Figure 8.11.4.2-1: Cell traffic trace

The NG-RAN node initiates the procedure by sending a CELL TRAFFIC TRACE message.

If the *Privacy Indicator* IE is included in the message, the AMF shall take the information into account for anonymization of MDT data as described in TS 32.422 [11].

8.11.4.3 Abnormal Conditions

Void.

8.12 Location Reporting Procedures

8.12.1 Location Reporting Control

8.12.1.1 General

The purpose of the Location Reporting Control procedure is to allow the AMF to request the NG-RAN node to report the UE's current location, or the UE's last known location with time stamp, or the UE's presence in the area of interest while in CM-CONNECTED state as specified in TS 23.501 [9] and TS 23.502 [10]. The procedure uses UE-associated signalling.

8.12.1.2 Successful Operation



Figure 8.12.1.2-1: Location reporting control

The AMF initiates the procedure by sending a LOCATION REPORTING CONTROL message to the NG-RAN node. On receipt of the LOCATION REPORTING CONTROL message the NG-RAN node shall perform the requested location reporting control action for the UE.

The Location Reporting Request Type IE indicates to the NG-RAN node whether:

- to report directly;
- to report upon change of serving cell;
- to report UE presence in the area of interest;
- to stop reporting at change of serving cell;
- to stop reporting UE presence in the area of interest;
- to cancel location reporting for the UE.

If the Area Of Interest List IE is included in the Location Reporting Request Type IE in the LOCATION REPORTING CONTROL message, the NG-RAN node shall store this information and use it to track the UE's presence in the area of interest as defined in TS 23.502 [10].

NOTE: The NG-RAN reports the UE presence for all set of Location Reporting Reference IDs for inter-NG-RAN node handover.

If the *Additional Location Information* IE is included in the LOCATION REPORTING CONTROL message and set to "Include PSCell" then, if Dual Connectivity is activated, the NG-RAN node shall include the current PSCell in the report. If a report upon change of serving cell is requested, the NG-RAN node shall provide the report also whenever the UE changes the PSCell, and when Dual Connectivity is activated.

If reporting upon change of serving cell is requested, the NG-RAN node shall send a report immediately and shall send a report whenever the UE's location changes.

8.12.1.3 Abnormal Conditions

Interactions with Location Reporting Failure Indication procedure:

If the NG-RAN node receives a LOCATION REPORTING CONTROL message containing several *Location Reporting Reference ID* IE set to the same value, the NG-RAN node shall send the LOCATION REPORTING FAILURE INDICATION message with an appropriate cause value.

8.12.2 Location Reporting Failure Indication

8.12.2.1 General

The purpose of the Location Reporting Failure Indication procedure is to allow the NG-RAN node to inform the AMF that the location reporting request contained in the Location Reporting Control procedure, the Handover Resource Allocation procedure or the Initial Context Setup procedure has failed. The procedure uses UE-associated signalling.

8.12.2.2 Successful Operation



Figure 8.12.2.2-1: Location reporting failure indication

The NG-RAN node initiates the procedure by sending a LOCATION REPORTING FAILURE INDICATION message to the AMF. Upon reception of the LOCATION REPORTING FAILURE INDICATION message the AMF shall, based on the failure reason indicated by the *Cause* IE, take appropriate action.

8.12.2.3 Abnormal Conditions

Void.

8.12.3 Location Report

8.12.3.1 General

The purpose of the Location Report procedure is to provide the UE's current location, the UE's last known location with time stamp, or the UE's presence in the area of interest to the AMF. The procedure uses UE-associated signalling.

8.12.3.2 Successful Operation



Figure 8.12.3.2-1: Location report

The NG-RAN node initiates the procedure by sending a LOCATION REPORT message to the AMF. The LOCATION REPORT message may be used as a response to the LOCATION REPORTING CONTROL message.

8.12.3.3 Abnormal Conditions

Void.

8.13 UE TNLA Binding Procedures

8.13.1 UE TNLA Binding Release

8.13.1.1 General

The purpose of the UE TNLA Binding Release procedure is to request the NG-RAN node to release the NGAP UE TNLA binding, while requesting the NG-RAN node to maintain NG-U (user plane connectivity) and UE context information as specified in TS 23.502 [10]. The procedure uses UE-associated signalling.

8.13.1.2 Successful Operation



Figure 8.13.1.2-1: UE TNLA binding release request

At reception of the UE TNLA BINDING RELEASE REQUEST message, the NG-RAN node shall release the UE TNLA binding for the UE indicated in the UE TNLA BINDING RELEASE REQUEST message. The NG-RAN node shall keep the NG-U (user plane connectivity) and UE context information for the UE, and behave according to TS 23.502 [10].

8.13.1.3 Abnormal Conditions

Void.

8.14 UE Radio Capability Management Procedures

8.14.1 UE Radio Capability Info Indication

8.14.1.1 General

The purpose of the UE Radio Capability Info Indication procedure is to enable the NG-RAN node to provide to the AMF UE radio capability-related information. The procedure uses UE-associated signalling.

8.14.1.2 Successful Operation



Figure 8.14.1.2-1: UE radio capability info indication

The NG-RAN node controlling a UE-associated logical NG connection initiates the procedure by sending a UE RADIO CAPABILITY INFO INDICATION message to the AMF including the UE radio capability information.

The UE RADIO CAPABILITY INFO INDICATION message may also include paging specific UE radio capability information within the *UE Radio Capability for Paging* IE. If the *UE Radio Capability for Paging* IE includes the *UE Radio Capability for Paging of NR* IE and the *UE Radio Capability for Paging of E-UTRA* IE, the AMF shall, if supported, use it as specified in TS 23.501 [9].

The UE radio capability information received by the AMF shall replace previously stored corresponding UE radio capability information in the AMF for the UE, as described in TS 23.501 [9].

If the UE RADIO CAPABILITY INFO INDICATION message includes the *UE Radio Capability – E-UTRA Format* IE, the AMF shall, if supported, use it as specified in TS 23.501 [9].

8.14.1.3 Abnormal Conditions

Void.

8.14.2 UE Radio Capability Check

8.14.2.1 General

The purpose of the UE Radio Capability Check procedure is for the AMF to request the NG-RAN node to derive and provide an indication to the AMF on whether the UE radio capabilities are compatible with the network configuration for IMS voice. The procedure uses UE-associated signalling.

8.14.2.2 Successful Operation



Figure 8.14.2.2-1: UE radio capability check procedure: successful operation

The AMF initiates the procedure by sending a UE RADIO CAPABILITY CHECK REQUEST message. If the UE-associated logical NG-connection is not established, the AMF shall allocate a unique AMF UE NGAP ID to be used for the UE and include the AMF UE NGAP ID IE in the UE RADIO CAPABILITY CHECK REQUEST message; by

receiving the AMF UE NGAP ID IE in the UE RADIO CAPABILITY CHECK REQUEST message, the NG-RAN node establishes the UE-associated logical NG-connection.

Upon receipt of the UE RADIO CAPABILITY CHECK REQUEST message, the NG-RAN node checks whether the UE radio capabilities are compatible with the network configuration for IMS voice, and responds with a UE RADIO CAPABILITY CHECK RESPONSE message, as defined in TS 23.502 [10].

If the *UE Radio Capability* IE is contained in the UE RADIO CAPABILITY CHECK REQUEST message, the NG-RAN node shall use it to determine the value of the *IMS Voice Support Indicator* IE to be included in the UE RADIO CAPABILITY CHECK RESPONSE message.

If the UE RADIO CAPABILITY CHECK REQUEST message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

8.14.2.3 Unsuccessful Operation

Not applicable.

8.14.2.4 Abnormal Conditions

Void.

8.14.3 UE Radio Capability ID Mapping

8.14.3.1 General

The purpose of the UE Radio Capability ID Mapping procedure is for the NG-RAN node to request from the AMF UE Radio Capability information mapped to the UE Radio Capability ID.

The procedure uses non UE-associated signalling.

8.14.3.2 Successful Operation

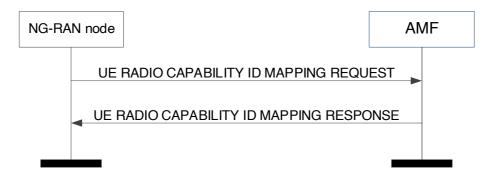


Figure 8.14.3.2-1: UE Radio Capability ID Mapping procedure: successful operation

The NG-RAN node initiates the procedure by sending a UE RADIO CAPABILITY ID MAPPING REQUEST message.

Upon receipt of the UE RADIO CAPABILITY ID MAPPING REQUEST message, the AMF shall provide within the UE RADIO CAPABILITY ID MAPPING RESPONSE message the UE Radio Capability information mapped to the UE Capability ID indicated in the UE RADIO CAPABILITY ID MAPPING REQUEST message.

8.14.3.3 Unsuccessful Operation

Not applicable.

8.14.3.4 Abnormal Conditions

8.15 Data Usage Reporting Procedures

8.15.1 Secondary RAT Data Usage Report

8.15.1.1 General

The purpose of the Secondary RAT Data Usage Report procedure is to provide information on the used resources of the secondary RAT (e.g. NR resources during MR-DC operation) as specified in TS 23.501 [9]. The procedure uses UE-associated signalling.

8.15.1.2 Successful Operation

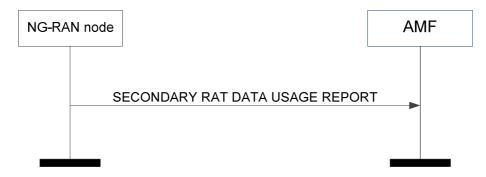


Figure 8.15.1.2-1: Secondary RAT data usage report

The NG-RAN node initiates the procedure by sending the SECONDARY RAT DATA USAGE REPORT message to the AMF.

If the *Handover Flag* IE is included in the SECONDARY RAT DATA USAGE REPORT message, it indicates that for each PDU session the AMF should buffer the *Secondary RAT Data Usage Report Transfer* IE since the secondary RAT data usage report is sent due to handover as defined in TS 23.502 [10].

For each PDU session for which the *Secondary RAT Usage Information List* IE is included in the the *Secondary RAT Data Usage Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

The NG-RAN node shall, if supported, report in the SECONDARY RAT DATA USAGE REPORT message location information of the UE in the *User Location Information* IE.

8.15.1.3 Abnormal Conditions

Void.

8.16 RIM Information Transfer Procedures

8.16.1 Uplink RIM Information Transfer

8.16.1.1 General

The purpose of the Uplink RIM Information Transfer procedure is to transfer RIM information from the NG-RAN node to the AMF. The AMF does not interpret the transferred RIM information. This procedure uses non-UE associated signalling.

8.16.1.2 Successful Operation



Figure 8.16.1.2-1: Uplink RIM Information Transfer

The NG-RAN node initiates the procedure by sending an UPLINK RIM INFORMATION TRANSFER message to the AMF.

Upon reception of the UPLINK RIM INFORMATION TRANSFER message, the AMF shall transparently transfer it towards the NG-RAN node indicated in the *Target RAN Node ID* IE.

8.16.1.3 Abnormal Conditions

Void.

8.16.2 Downlink RIM Information Transfer

8.16.2.1 General

The purpose of the Downlink RIM Information Transfer procedure is to transfer RIM information from the AMF to the NG-RAN node. This procedure uses non-UE associated signalling.

8.16.2.2 Successful Operation



Figure 8.16.2.2-1: Downlink RIM Information Transfer

The AMF initiates the procedure by sending a DOWNLINK RIM INFORMATION TRANSFER message to the NG-RAN node. The NG-RAN node may use the RIM information in the received DOWNLINK RIM INFORMATION TRANSFER message for executing the RIM functionality, as specified in TS 38.300 [8].

8.16.2.3 Abnormal Conditions

8.17 Broadcast Session Management Procedures

8.17.1 Broadcast Session Setup

8.17.1.1 General

The purpose of the Broadcast Session Setup procedure is to request the NG-RAN node to setup MBS resources for an MBS session of a broadcast service. The procedure uses non-UE associated signalling.

8.17.1.2 Successful Operation



Figure 8.17.1.2-1: Broadcast Session Setup, successful operation.

The AMF initiates the procedure by sending a BROADCAST SESSION SETUP REQUEST message to the NG-RAN node. If the NG-RAN node accepts all the flows in the MBS session at least in one of its cells, the NG-RAN node responds with the BROADCAST SESSION SETUP RESPONSE message.

If the MBS Service Area IE is included in the BROADCAST SESSION SETUP REQUEST message, the NG-RAN node shall take it into account as specified in TS 23.247 [44].

If the MBS Session FSA ID List IE is included in the BROADCAST SESSION SETUP REQUEST message, the NG-RAN node shall take it into account to determine cells/frequencies within the MBS service area to broadcast MBS session data as specified in TS 23.247 [44].

8.17.1.3 Unsuccessful Operation



Figure 8.17.1.3-1: Broadcast Session Setup, unsuccessful operation.

If the NG-RAN node is not able to provide the resources for all the flows in the MBS session in any of its cells, it shall send the BROADCAST SESSION SETUP FAILURE message.

8.17.1.4 Abnormal Conditions

8.17.2 Broadcast Session Modification

8.17.2.1 General

The purpose of the Broadcast Session Modification procedure is to request the NG-RAN node to update the broadcast area or the MBS information related to a previously established MBS session. The procedure uses non-UE associated signalling.

8.17.2.2 Successful Operation



Figure 8.17.2.2-1: Broadcast Session Modification, successful operation.

The AMF initiates the procedure by sending a BROADCAST SESSION MODIFICATION REQUEST message to the NG-RAN node.

If the *MBS Service Area* IE is included in the BROADCAST SESSION MODIFICATION REQUEST message, the NG-RAN node shall update the MBS service area and send the BROADCAST SESSION MODIFICATION RESPONSE message.

If the MBS Session Modification Request Transfer IE is included in the BROADCAST SESSION MODIFICATION REQUEST message, the NG-RAN node shall replace the previously provided information by the newly received one and update the MBS context and resources as necessary and send the BROADCAST SESSION MODIFICATION RESPONSE message.

8.17.2.3 Unsuccessful Operation



Figure 8.17.2.3-1: Broadcast Session Modification, unsuccessful operation.

If the NG-RAN node fails to update any requested modification, the NG-RAN node shall send the BROADCAST SESSION MODIFICATION FAILURE message.

8.17.2.4 Abnormal Conditions

8.17.3 Broadcast Session Release

8.17.3.1 General

The purpose of the Broadcast Session Release procedure is to release the MBS context corresponding to the previous established MBS session. The procedure uses non-UE assocated signalling.

8.17.3.2 Successful Operation



Figure 8.17.3.2-1: Broadcast Session Release, successful operation.

The AMF initiates the procedure by sending a BROADCAST SESSION RELEASE REQUEST message to the NG-RAN node.

Upon reception of the BROADCAST SESSION RELEASE REQUEST message, the NG-RAN node shall respond with the BROADCAST SESSION RELEASE RESPONSE message. The NG-RAN node node shall stop broadcasting and release all resources associated with the broadcast session.

Upon reception of the BROADCAST SESSION RELEASE RESPONSE message, the AMF shall transfer transparently the *Broadcast Session Release Response Transfer* IE, if available, to the MB-SMF.

8.17.3.3 Unsuccessful Operation

Not applicable.

8.17.3.4 Abnormal Conditions

Void.

8.17.4 Broadcast Session Release Required

8.17.4.1 General

The purpose of the Broadcast Session Release Required procedure is to trigger the AMF to release the MBS context corresponding to the previously established MBS session. The procedure uses non-UE associated signalling.

8.17.4.2 Successful Operation



Figure 8.17.4.2-1: Broadcast Session Release Required, successful operation.

The NG-RAN node initiates the procedure by sending a BROADCAST SESSION RELEASE REQUIRED message to the AMF.

Upon receiption of the BROADCAST SESSION RELEASE REQUIRED message, the AMF shall realize there is no adequate resources for NG-RAN node to provide the broadcast service over radio and start to release the MBS context corresponding to the previously established MBS session.

8.17.4.3 Abnormal Conditions

Void.

8.18 Multicast Session Management Procedures

8.18.1 Distribution Setup

8.18.1.1 General

The purpose of the Distribution Setup procedure is to assign NG-U resources for an MBS session. The procedure uses non-UE-associated signalling.

8.18.1.2 Successful Operation

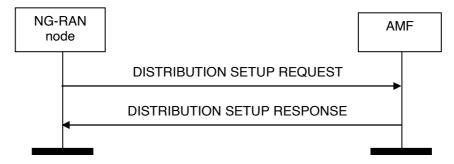


Figure 8.18.1.2-1: Distribution Setup, successful operation.

The NG-RAN node initiates the procedure by sending a DISTRIBUTION SETUP REQUEST message to the AMF. The AMF responds with a DISTRIBUTION SETUP RESPONSE message.

For location dependent multicast sessions, the NG-RAN node shall include the *MBS Area Session ID* IE in the DISTRIBUTION SETUP REQUEST message, and the AMF shall provide the same value of the *MBS Area Session ID* IE in the DISTRIBUTION SETUP RESPONSE message.

If the *Shared NG-U Unicast TNL Information* IE is included in the *MBS Distribution Setup Request Transfer* IE in the DISTRIBUTION SETUP REQUEST message, the MB-SMF shall use the included information as the downlink termination point for the shared NG-U transport.

If the Shared NG-U Unicast TNL Information IE is not included in the MBS Distribution Setup Request Transfer IE in the DISTRIBUTION SETUP REQUEST message, the MB-SMF shall interpret that the IP multicast is used for this shared NG-U transport, and include the Shared NG-U Multicast TNL Information IE in the MBS Distribution Setup Response Transfer IE in the DISTRIBUTION SETUP RESPONSE message.

8.18.1.3 Unsuccessful Operation

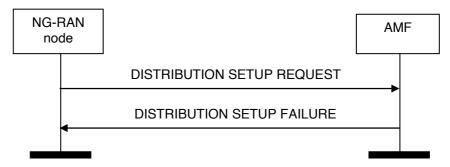


Figure 8.18.1.3-1: Distribution Setup, unsuccessful operation.

In case the shared NG-U transport cannot be setup successfully, the AMF shall respond with the DISTRIBUTION SETUP FAILURE message to the NG-RAN node with an appropriate cause value.

8.18.1.4 Abnormal Conditions

Void.

8.18.2 Distribution Release

8.18.2.1 General

The purpose of the Distribution Release procedure is to enable the release of an already established NG-U resources for a given MBS session, or for a given area session of the MBS session. The procedure uses non-UE-associated signalling.

8.18.2.2 Successful Operation

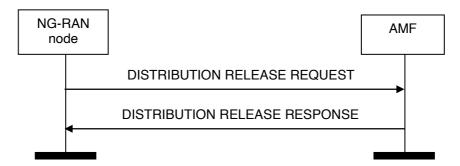


Figure 8.18.2.2-1: Distribution Release, successful operation.

The NG-RAN node initiates the procedure by sending a DISTRIBUTION RELEASE REQUEST message.

Upon receipt of the DISTRIBUTION RELEASE REQUEST message, the AMF shall send the DISTRIBUTION RELEASE RESPONSE message after successfully removing the corresponding NG-U resource for the MBS session.

For location dependent multicast session, the NG-RAN node shall include the *MBS Area Session ID* IE in the DISTRIBUTION RELEASE REQUEST message, and the AMF shall provide the same value of the *MBS Area Session ID* IE in the DISTRIBUTION RELEASE RESPONSE message.

If unicast shared NG-U transport is used, the NG-RAN node shall include the *Shared NG-U TNL Information* IE in the *MBS Distribution Release Request Transfer* IE in the DISTRIBUTION RELEASE REQUEST message, and the MB-SMF shall release the corresponding shared NG-U transport as specified in TS 23.247 [44].

8.18.2.3 Unsuccessful Operation

Not applicable.

8.18.2.4 Abnormal Conditions

Void.

8.18.3 Multicast Session Activation

8.18.3.1 General

The purpose of the Multicast Session Activation procedure is to request a NG-RAN node to activate the MBS resources of one MBS session. The procedure uses non-UE-associated signalling.

8.18.3.2 Successful Operation

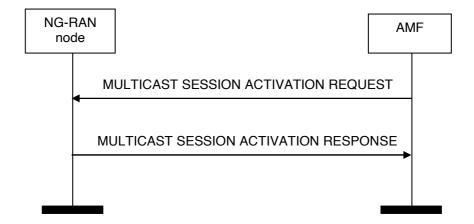


Figure 8.18.3.2-1: Multicast Session Activation, successful operation.

The AMF initiates the procedure by sending a MULTICAST SESSION ACTIVATION REQUEST message to the NG-RAN node.

Upon receipt of the MULTICAST SESSION ACTIVATION REQUEST, the NG-RAN node activates the MBS resources corresponding to the MBS session indicated in the MULTICAST SESSION ACTIVATION REQUEST message and indicates in the MULTICAST SESSION ACTIVATION RESPONSE message for which MBS session the request was fulfilled.

8.18.3.3 Unsuccessful Operation

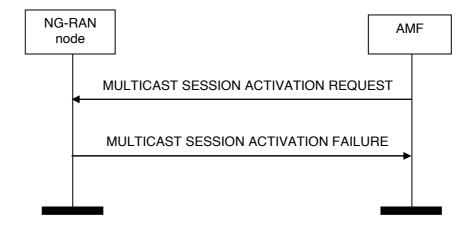


Figure 8.18.3.3-1: Multicast Session Activation, unsuccessful operation.

If the NG-RAN node cannot activate the MBS resources indicated in the MULTICAST SESSION ACTIVATION REQUEST message, it shall respond with a MULTICAST SESSION ACTIVATION FAILURE message with an appropriate cause value.

8.18.3.4 Abnormal Conditions

Void.

8.18.4 Multicast Session Deactivation

8.18.4.1 General

The purpose of the Multicast Session Deactivation procedure is to request a NG-RAN node to deactivate the MBS resources of one MBS session. The procedure uses non-UE-associated signalling.

8.18.4.2 Successful Operation



Figure 8.18.4.2-1: Multicast Session Deactivation, successful operation.

The AMF initiates the procedure by sending a MULTICAST SESSION DEACTIVATION REQUEST message to the NG-RAN node.

Upon receipt of this message, the NG-RAN node shall deactivate the MBS resources corresponding to the MBS session indicated in the MULTICAST SESSION DEACTIVATION REQUEST message and shall indicate in the MULTICAST SESSION DEACTIVATION RESPONSE message for which MBS session the request was fulfilled.

8.18.4.3 Unsuccessful Operation

Not applicable.

8.18.4.4 Abnormal Conditions

Void.

8.18.5 Multicast Session Update

8.18.5.1 General

The purpose of the Multicast Session Update procedure is to request the NG-RAN node to update the MBS service area and/or the MBS QoS information related to a MBS session, or to an area session of a location dependent multicast session. The procedure uses non-UE associated signalling.

8.18.5.2 Successful Operation

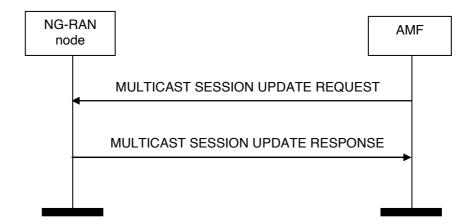


Figure 8.18.5.2-1: Multicast Session Update, successful operation.

The AMF initiates the procedure by sending a MULTICAST SESSION UPDATE REQUEST message to the NG-RAN node.

Upon receipt of the MULTICAST SESSION UPDATE REQUEST message, the NG-RAN node shall update the QoS profile and/or MBS Service Area for the multicast service and send the MULTICAST SESSION UPDATE RESPONSE message to the AMF.

For location dependent multicast session, the AMF shall include the *MBS Area Session ID* IE in the MULTICAST SESSION UPDATE REQUEST message, and the NG-RAN node shall provide the same value of the *MBS Area Session ID* IE in the MULTICAST SESSION UPDATE RESPONSE message.

In case the MBS Service Area Information IE is included in the Multicast Session Update Request Transfer IE in the MULTICAST SESSION UPDATE REQUEST message, the NG-RAN node shall update the stored MBS Service Area Information for that service, as specified in TS 23.247 [44].

In case the MBS QoS Flows To Be Setup or Modify List IE is included in the Multicast Session Update Request Transfer IE in the MULTICAST SESSION UPDATE REQUEST message, the NG-RAN node shall setup or modify the MBS QoS information accordingly.

In case the MBS QoS Flows To Be Release List IE is included in the Multicast Session Update Request Transfer IE in the MULTICAST SESSION UPDATE REQUEST message, the NG-RAN node shall release the indicated MBS QoS flows.

8.18.5.3 Unsuccessful Operation

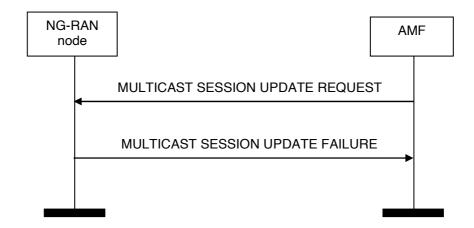


Figure 8.18.5.3-1: Multicast Session Update, unsuccessful operation.

If the NG-RAN node is not able to perform any of the requested update, it shall respond with a MULTICAST SESSION UPDATE FAILURE message with an appropriate cause value.

8.18.5.4 Abnormal Conditions

Void.

9 Elements for NGAP Communication

9.0 General

Subclauses 9.2 and 9.3 present the NGAP 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 [7].

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;

9.1 Tabular Format Contents

9.1.1 Presence

All IEs are marked mandatory, optional or conditional according to table 9.1.1-1.

Table 9.1.1-1: Meaning of content within "Presence" column

Abbreviation	Meaning
M	IEs marked as Mandatory (M) shall always be included in the
	message.
0	IEs marked as Optional (O) may or may not be included in the
	message.
С	IEs marked as Conditional (C) shall be included in a message only if
	the condition is satisfied. Otherwise the IE shall not be included.

9.1.2 Criticality

Each IE or group of IEs may have criticality information applied to it according to table 9.1.2-1.

Table 9.1.2-1: Meaning of content within "Criticality" column

Abbreviation	Meaning				
-	No criticality information is applied explicitly.				
YES	Criticality information is applied. This is usable only for non-				
	repeatable IEs				
GLOBAL	The IE and all its repetitions together have one common criticality information. This is usable only for repeatable IEs.				
EACH	Each repetition of the IE has its own criticality information. It is not allowed to assign different criticality values to the repetitions. This is usable only for repeatable IEs.				

9.1.3 Range

The Range column indicates the allowed number of copies of repetitive IEs/IE groups.

9.1.4 Assigned Criticality

The Assigned Criticality column provides the actual criticality information as defined in subclause 10.3.2, if applicable.

9.2 Message Functional Definition and Content

9.2.1 PDU Session Management Messages

9.2.1.1 PDU SESSION RESOURCE SETUP REQUEST

This message is sent by the AMF and is used to request the NG-RAN node to assign resources on Uu and NG-U for one or several PDU session resources.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	М		9.3.3.2		YES	reject
RAN Paging Priority	0		9.3.3.15		YES	ignore
NAS-PDU	0		9.3.3.4		YES	reject
PDU Session		1			YES	reject
Resource Setup						
Request List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Setup		ofPDUSes				
Request Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session NAS-	0		NAS-PDU		-	
PDU			9.3.3.4			
>>S-NSSAI	M		9.3.1.24		-	
>>PDU Session	M		OCTET	Containing the	-	
Resource Setup			STRING	PDU Session		
Request Transfer				Resource Setup		
				Request Transfer		
				IE specified in		
				subclause 9.3.4.1.		
>>PDU Session	0		Expected UE	Expected UE	YES	ignore
Expected UE Activity			Activity	Activity Behaviour		
Behaviour			Behaviour	for the PDU		
115 4			9.3.1.94	Session.	7/20	
UE Aggregate	0		9.3.1.58		YES	ignore
Maximum Bit Rate			0.04.004		\/F0	•
UE Slice Maximum Bit Rate List	0		9.3.1.231		YES	ignore

Range bound	Explanation			
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.			

9.2.1.2 PDU SESSION RESOURCE SETUP RESPONSE

This message is sent by the NG-RAN node as a response to the request to assign resources on Uu and NG-U for one or several PDU session resources.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1	description	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session	IVI	01	3.0.0.Z		YES	ignore
Resource Setup		01			120	ignore
Response List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>_</td><td></td></maxno<>			_	
Resource Setup		ofPDUSes				
Response Item		sions>				
>>PDU Session ID	М		9.3.1.50		-	
>>PDU Session Resource Setup	М		OCTET STRING	Containing the PDU Session	-	
Response Transfer			STRING	Resource Setup		
nesponse transier				Response		
				Transfer IE		
				specified in		
				subclause 9.3.4.2.		
PDU Session		01			YES	ignore
Resource Failed to						J
Setup List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Failed to		ofPDUSes				
Setup Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session	M		OCTET	Containing the	-	
Resource Setup			STRING	PDU Session		
Unsuccessful				Resource Setup		
Transfer				Unsuccessful		
				Transfer IE		
				specified in		
				subclause 9.3.4.16.		
Criticality Diagnostics	0		9.3.1.3	3.0.4.10.	YES	ignore

Range bound	Explanation			
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.	1		

9.2.1.3 PDU SESSION RESOURCE RELEASE COMMAND

This message is sent by the AMF and is used to request the NG-RAN node to release already established PDU session resources for a given UE.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	•	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RAN Paging Priority	0		9.3.3.15		YES	ignore
NAS-PDU	0		9.3.3.4		YES	ignore
PDU Session Resource to Release		1			YES	reject
List						
>PDU Session Resource to Release Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Release Command Transfer	М		OCTET STRING	Containing the PDU Session Resource Release Command Transfer IE specified in subclause 9.3.4.12.	-	

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.1.4 PDU SESSION RESOURCE RELEASE RESPONSE

This message is sent by the NG-RAN node as a response to the request to release already established PDU session resources for a given UE.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session		1			YES	ignore
Resource Released List						
>PDU Session Resource Released Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Release Response Transfer	М		OCTET STRING	Containing the PDU Session Resource Release Response Transfer IE specified in subclause 9.3.4.21.	-	
User Location Information	0		9.3.1.16		YES	ignore
Criticality Diagnostics	0	_	9.3.1.3		YES	ignore

9.2.1.5 PDU SESSION RESOURCE MODIFY REQUEST

This message is sent by the AMF and is used to request the NG-RAN node to enable modifications of already established PDU session resources for a given UE.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RAN Paging Priority	0		9.3.3.15		YES	ignore
PDU Session		1			YES	reject
Resource Modify						-
Request List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Modify		ofPDUSes				
Request Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>NAS-PDU	0		9.3.3.4		-	
>>PDU Session	M		OCTET	Containing the	-	
Resource Modify			STRING	PDU Session		
Request Transfer				Resource Modify		
				Request Transfer		
				IE specified in		
				subclause 9.3.4.3.		
>>S-NSSAI	0		9.3.1.24		YES	reject
>>PDU Session	0		Expected UE	Expected UE	YES	ignore
Expected UE Activity			Activity	Activity Behaviour		
Behaviour			Behaviour	for the PDU		
			9.3.1.94	Session.		

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.1.6 PDU SESSION RESOURCE MODIFY RESPONSE

This message is sent by the NG-RAN node and is used to report the outcome of the request from the PDU SESSION RESOURCE MODIFY REQUEST message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session		01			YES	ignore
Resource Modify						
Response List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Modify		ofPDUSes				
Response Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Modify Response Transfer	M		OCTET STRING	Containing the PDU Session Resource Modify Response Transfer IE specified in subclause 9.3.4.4.	-	
PDU Session Resource Failed to Modify List		01			YES	ignore
>PDU Session Resource Failed to Modify Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Modify Unsuccessful Transfer	M		OCTET STRING	Containing the PDU Session Resource Modify Unsuccessful Transfer IE specified in subclause 9.3.4.17.	-	
User Location Information	0		9.3.1.16		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.1.7 PDU SESSION RESOURCE NOTIFY

This message is sent by the NG-RAN node to notify that the QoS requirements of already established GBR QoS flow(s) for which notification control has been requested are either not fulfilled anymore or fulfilled again by the NG-RAN node. This message can also be sent by the NG-RAN node to notify that PDU session resource(s) for a given UE are released.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	ignore
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
PDU Session Resource Notify List		01			YES	reject
>PDU Session Resource Notify Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Notify Transfer	M		OCTET STRING	Containing the PDU Session Resource Notify Transfer IE specified in subclause 9.3.4.5.	-	
PDU Session Resource Released List		01			YES	ignore
>PDU Session Resource Released Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Notify Released Transfer	М		OCTET STRING	Containing the PDU Session Resource Notify Released Transfer IE specified in subclause 9.3.4.13.	-	
User Location Information	0		9.3.1.16		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.1.8 PDU SESSION RESOURCE MODIFY INDICATION

This message is sent by the NG-RAN node and is used to request the AMF to enable modifications of already established PDU session resources for a given UE.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	М		9.3.3.2		YES	reject
PDU Session Resource Modify Indication List		1			YES	reject
>PDU Session Resource Modify Indication Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>PDU Session Resource Modify Indication Transfer	M		OCTET STRING	Containing the PDU Session Resource Modify Indication Transfer IE specified in subclause 9.3.4.6.	-	
User Location Information	0		9.3.1.16		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.1.9 PDU SESSION RESOURCE MODIFY CONFIRM

This message is sent by the AMF and is used to confirm the outcome of the request from the PDU SESSION RESOURCE MODIFY INDICATION message.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1	description	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	
PDU Session	IVI	01	9.3.3.2		YES	ignore ignore
Resource Modify		01			163	ignore
Confirm List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>_</td><td></td></maxno<>			_	
Resource Modify		ofPDUSes				
Confirm Item		sions>				
>>PDU Session ID	М	0.01.02	9.3.1.50		-	
>>PDU Session Resource Modify Confirm Transfer	M		OCTET STRING	Containing the PDU Session Resource Modify Confirm Transfer IE specified in subclause 9.3.4.7.	-	
PDU Session Resource Failed to Modify List		01			YES	ignore
>PDU Session Resource Failed to Modify Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session Resource Modify Indication Unsuccessful Transfer	M		OCTET STRING	Containing the PDU Session Resource Modify Indication Unsuccessful Transfer IE specified in subclause 9.3.4.22.	-	
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.2 UE Context Management Messages

9.2.2.1 INITIAL CONTEXT SETUP REQUEST

This message is sent by the AMF to request the setup of a UE context.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	М		9.3.3.2		YES	reject
Old AMF	0		AMF Name 9.3.3.21		YES	reject
UE Aggregate Maximum Bit Rate	C- ifPDUses sionReso urceSetu p		9.3.1.58		YES	reject
Core Network Assistance Information for RRC INACTIVE	O		9.3.1.15		YES	ignore
GUAMI	М		9.3.3.3		YES	reject
PDU Session Resource Setup Request List		01	0.0.0.0		YES	reject
>PDU Session Resource Setup Request Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>PDU Session NAS- PDU	0		NAS-PDU 9.3.3.4		-	
>>S-NSSAI	М		9.3.1.24		-	
>>PDU Session Resource Setup Request Transfer	М		OCTET STRING	Containing the PDU Session Resource Setup Request Transfer IE specified in subclause 9.3.4.1.	-	
>>PDU Session Expected UE Activity Behaviour	0		Expected UE Activity Behaviour 9.3.1.94	Expected UE Activity Behaviour for the PDU Session.	YES	ignore
Allowed NSSAI	М		9.3.1.31	Indicates the S- NSSAIs permitted by the network	YES	reject
UE Security Capabilities	М		9.3.1.86		YES	reject
Security Key	М		9.3.1.87		YES	reject
Trace Activation	0		9.3.1.14		YES	ignore
Mobility Restriction List	0		9.3.1.85		YES	ignore
UE Radio Capability	0		9.3.1.74		YES	ignore
Index to RAT/Frequency Selection Priority	0		9.3.1.61		YES	ignore
Masked IMEISV	0		9.3.1.54		YES	ignore
NAS-PDU	0		9.3.3.4		YES	ignore
Emergency Fallback Indicator	0		9.3.1.26		YES	reject
RRC Inactive Transition Report Request	0		9.3.1.91		YES	ignore
UE Radio Capability for Paging	0		9.3.1.68		YES	ignore
Redirection for Voice EPS Fallback	0		9.3.1.116		YES	ignore
Location Reporting Request Type	0		9.3.1.65		YES	ignore
CN Assisted RAN Parameters Tuning	0		9.3.1.119		YES	ignore
SRVCC Operation Possible	О		9.3.1.128		YES	ignore
IAB Authorized	0		9.3.1.129		YES	ignore
Enhanced Coverage Restriction	0		9.3.1.140		YES	ignore
Extended Connected Time	0		9.3.3.31		YES	ignore

UE Differentiation		0.04.444	1	VEC	
UE Differentiation Information	0	9.3.1.144		YES	ignore
NR V2X Services	0	9.3.1.146		YES	ignore
Authorized				0	.9
LTE V2X Services	0	9.3.1.147		YES	ignore
Authorized					Ŭ
NR UE Sidelink	0	9.3.1.148	This IE applies	YES	ignore
Aggregate Maximum Bit			only if the UE is		
Rate			authorized for NR		
1.TE 1.1E 0: 1 !! 1		0.0 4 440	V2X services.	\/50	
LTE UE Sidelink	0	9.3.1.149	This IE applies	YES	ignore
Aggregate Maximum Bit			only if the UE is authorized for LTE		
Rate			V2X services.		
PC5 QoS Parameters	0	9.3.1.150	This IE applies	YES	ignore
FC5 Q05 Farameters		9.3.1.130	only if the UE is	ILS	ignore
			authorized for NR		
			V2X services.		
CE-mode-B Restricted	0	9.3.1.155	12/100/1/000/	YES	ignore
UE User Plane CloT	0	9.3.1.160		YES	ignore
Support Indicator					
RG Level Wireline	0	OCTET STRING	Specified in TS	YES	ignore
Access Characteristics			23.316 [34].		
			Indicates the		
			wireline access		
			technology specific		
			QoS information		
			corresponding to a		
			specific wireline access		
			subscription.		
Management Based MDT	0	MDT PLMN List	Subscription.	YES	ignore
PLMN List		9.3.1.168		0	.5
UE Radio Capability ID	0	9.3.1.142		YES	reject
Time Synchronisation	0	9.3.1.220		YES	ignore
Assistance Information					
QMC Configuration	0	9.3.1.223		YES	ignore
Information					
Target NSSAI	0	9.3.1.229		YES	ignore
Information					
UE Slice Maximum Bit	0	9.3.1.231		YES	ignore
Rate List		0.0.4.000		\/50	
5G ProSe Authorized	0	9.3.1.233	This IT as P	YES	ignore
5G ProSe UE PC5	0	NR UE Sidelink	This IE applies	YES	ignore
Aggregate Maximum Bit		Aggregate	only if the UE is authorized for 5G		
Rate		Maximum Bit Rate	ProSe services.		
		9.3.1.148	FIUSE SERVICES.		
5G ProSe PC5 QoS	0	9.3.1.234	This IE applies	YES	ignore
Parameters		9.3.1.234	only if the UE is	163	ignore
i didilibibis			authorized for 5G		
			ProSe services.		

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

Condition	Explanation
ifPDUsessionResourceSetup	This IE shall be present if the PDU Session Resource Setup List IE is present.

9.2.2.2 INITIAL CONTEXT SETUP RESPONSE

This message is sent by the NG-RAN node to confirm the setup of a UE context.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics	Criticality	Assigned
Managa Tuna	M		9.3.1.1	description	YES	Criticality
Message Type AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session	IVI	01	9.3.3.2			ignore
Resource Setup		01			YES	ignore
Response List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td></td><td></td></maxno<>				
Resource Setup		ofPDUSes			_	
Response Item		sions>				
>>PDU Session ID	М	3101132	9.3.1.50		_	
>>PDU Session	M		OCTET	Containing the	_	
Resource Setup	IVI		STRING	PDU Session		
Response Transfer			OTTIING	Resource Setup		
riesponse mansier				Response		
				Transfer IE		
				specified in		
				subclause 9.3.4.2.		
PDU Session		01		000010000 0.0.1.2.	YES	ignore
Resource Failed to		0				1911010
Setup List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Failed to		ofPDUSes				
Setup Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>PDU Session	М		OCTET	Containing the	-	
Resource Setup			STRING	PDU Session		
Unsuccessful				Resource Setup		
Transfer				Unsuccessful		
				Transfer IE		
				specified in		
				subclause		
				9.3.4.16.		
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.2.3 INITIAL CONTEXT SETUP FAILURE

This message is sent by the NG-RAN node to indicate that the setup of the UE context was unsuccessful.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
RAN UE NGAP ID	М		9.3.3.2		YES	ignore
PDU Session		01			YES	ignore
Resource Failed to Setup List						
>PDU Session Resource Failed to Setup Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>PDU Session Resource Setup Unsuccessful Transfer	М		OCTET STRING	Containing the PDU Session Resource Setup Unsuccessful Transfer IE specified in subclause 9.3.4.16.	-	
Cause	М		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound Explanation			
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.		

9.2.2.4 UE CONTEXT RELEASE REQUEST

This message is sent by the NG-RAN node to request the release of the UE-associated logical NG-connection over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
PDU Session		01			YES	reject
Resource List						-
>PDU Session Resource Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
Cause	M		9.3.1.2		YES	ignore

Range bound	Explanation				
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.				

9.2.2.5 UE CONTEXT RELEASE COMMAND

This message is sent by the AMF to request the release of the UE-associated logical NG-connection over the NG interface.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
CHOICE UE NGAP IDs	M				YES	reject
>UE NGAP ID pair						
>>AMF UE NGAP ID	M		9.3.3.1		-	
>>RAN UE NGAP ID	M		9.3.3.2		-	
>AMF UE NGAP ID						
>>AMF UE NGAP ID	M	•	9.3.3.1		-	
Cause	M	•	9.3.1.2		YES	ignore

9.2.2.6 UE CONTEXT RELEASE COMPLETE

This message is sent by the NG-RAN node to confirm the release of the UE-associated logical NG-connection over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
RAN UE NGAP ID	М		9.3.3.2		YES	ignore
User Location Information	0		9.3.1.16		YES	ignore
Information on Recommended Cells and RAN Nodes for Paging	0		9.3.1.100		YES	ignore
PDU Session Resource List		01			YES	reject
>PDU Session Resource Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>PDU Session Resource Release Response Transfer	0		OCTET STRING	Containing the PDU Session Resource Release Response Transfer IE specified in subclause 9.3.4.21.	YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore
Paging Assistance Data for CE Capable UE	0		9.3.1.141		YES	ignore

Range bound	Explanation			
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.			

9.2.2.7 UE CONTEXT MODIFICATION REQUEST

This message is sent by the AMF to provide UE Context information changes to the NG-RAN node.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description	\/F0	Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RAN Paging Priority	0		9.3.3.15		YES	ignore
Security Key	0		9.3.1.87		YES	reject
Index to	0		9.3.1.61		YES	ignore
RAT/Frequency						
Selection Priority			0.04.50		\/F0	
UE Aggregate	0		9.3.1.58		YES	ignore
Maximum Bit Rate			0.04.00		\/=0	
UE Security Capabilities	0		9.3.1.86		YES	reject
Core Network	0		9.3.1.15		YES	ignore
Assistance Information						
for RRC INACTIVE			0.04.00		\/=0	
Emergency Fallback	0		9.3.1.26		YES	reject
Indicator			AMELIENIOAD		\/=0	
New AMF UE NGAP ID	0		AMF UE NGAP		YES	reject
			ID			
BB01 T			9.3.3.1		\/=0	
RRC Inactive Transition	0		9.3.1.91		YES	ignore
Report Request			OLIANA		\/F0	
New GUAMI	0		GUAMI		YES	reject
CN Assisted RAN			9.3.3.3		VE0	•
	0		9.3.1.119		YES	ignore
Parameters Tuning			0.04.400		VEC	:
SRVCC Operation	0		9.3.1.128		YES	ignore
Possible			0.0.1.100		\/50	
IAB Authorized	0		9.3.1.129		YES	ignore
NR V2X Services	0		9.3.1.146		YES	ignore
Authorized			0.04.447		VE0	•
LTE V2X Services	0		9.3.1.147		YES	ignore
Authorized			0.04.440	This IT and the	VE0	•
NR UE Sidelink	0		9.3.1.148	This IE applies only if the UE is	YES	ignore
Aggregate Maximum Bit Rate				authorized for NR		
Hate						
LTE UE Sidelink	0		9.3.1.149	V2X services. This IE applies	YES	ianoro
Aggregate Maximum Bit			9.3.1.149	only if the UE is	153	ignore
Rate				authorized for LTE		
nate				V2X services.		
PC5 QoS Parameters	0		9.3.1.150	This IE applies	YES	ignore
1 03 Q00 i arameters			9.0.1.100	only if the UE is	120	ignore
				authorized for NR		
				V2X services.		
UE Radio Capability ID	0		9.3.1.142	* Z/X 001 V1003.	YES	reject
RG Level Wireline	0		OCTET	Specified in TS 23.	YES	ignore
Access Characteristics			STRING	316 [34]. Indicates	'L'	ignore
Access Characteristics			STILLING	the wireline		
				access technology		
				specific QoS		
				information		
				corresponding to a		
				specific wireline		
				access		
				subscription.		
Time Synchronisation	0		9.3.1.220	Caboonphon.	YES	ignore
Assistance Information	~		0.0.1.220		'5	1911016
QMC Configuration	0		9.3.1.223		YES	ignore
Information	~		3.0.1.220		'[5	1911016
QMC Deactivation	0		9.3.1.222		YES	ignore
UE Slice Maximum Bit	0		9.3.1.231		YES	ignore
Rate List	~		3.0.1.201		'[5	ignore
Management Based	0		MDT PLMN		YES	ignore
MDT PLMN			Modification List		'L'	1911016
Modification List			9.3.1.243			
oamoation List	i L		0.0.1.2.10	l .	ı	1

5G ProSe Authorized	0	9	9.3.1.233		YES	ignore
5G ProSe UE PC5 Aggregate Maximum Bit Rate	0	A N F	NR UE Sidelink Aggregate Maximum Bit Rate 9.3.1.148	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore
5G ProSe PC5 QoS Parameters	0	٤	9.3.1.234	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore

9.2.2.8 UE CONTEXT MODIFICATION RESPONSE

This message is sent by the NG-RAN node to confirm the performed UE context updates.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
RRC State	0		9.3.1.92		YES	ignore
User Location Information	0		9.3.1.16		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.2.9 UE CONTEXT MODIFICATION FAILURE

This message is sent by the NG-RAN node in case the performed UE context update is not successful.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.2.10 RRC INACTIVE TRANSITION REPORT

This message is sent by the NG-RAN node to notify the 5GC the UE enters or leaves RRC_INACTIVE state.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RRC State	M		9.3.1.92		YES	ignore
User Location	M		9.3.1.16		YES	ignore
Information						

9.2.2.11 CONNECTION ESTABLISHMENT INDICATION

This message is sent by the AMF to complete the establishment of the UE-associated logical NG-connection.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	•	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
UE Radio Capability	0		9.3.1.74		YES	ignore
End Indication	0		9.3.3.32		YES	ignore
S-NSSAI	0		9.3.1.24		YES	ignore
Allowed NSSAI	0		9.3.1.31	Indicates the S- NSSAIs permitted by the network	YES	ignore
UE Differentiation Information	0		9.3.1.144		YES	ignore
DL CP Security Information	0		9.3.3.49		YES	ignore
NB-IoT UE Priority	0		9.3.1.145		YES	ignore
Enhanced Coverage Restriction	0		9.3.1.140		YES	ignore
CE-mode-B Restricted	0		9.3.1.155		YES	ignore
UE Radio Capability ID	0		9.3.1.142		YES	reject

9.2.2.12 AMF CP RELOCATION INDICATION

This message is sent by the AMF to inform the NG-RAN node that the UE is to be relocated as described in TS. 38.300 [8].

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	-	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
S-NSSAI	0		9.3.1.24		YES	ignore
Allowed NSSAI	0		9.3.1.31	Indicates the S- NSSAIs permitted by the network	YES	ignore

9.2.2.13 RAN CP RELOCATION INDICATION

This message is sent by the NG-RAN node to initiate the establishment of a UE-associated logical NG-connection, following the reception of re-establishment request.

Direction: NG-RAN node \rightarrow AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
5G-S-TMSI	M		9.3.3.20		YES	reject
E-UTRA CGI	M		9.3.1.9		YES	ignore
TAI	M		9.3.3.11		YES	ignore
UL CP Security Information	М		9.3.3.48		YES	reject

9.2.2.14 RETRIEVE UE INFORMATION

The message is sent by the NG-RAN node to request UE information over the NG interface.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
5G-S-TMSI	M		9.3.3.20		YES	reject

9.2.2.15 UE INFORMATION TRANSFER

The message is sent by the AMF to transfer UE information over the NG interface.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
5G-S-TMSI	М		9.3.3.20		YES	reject
NB-IoT UE Priority	0		9.3.1.145		YES	ignore
UE Radio Capability	0		9.3.1.74		YES	ignore
S-NSSAI	0		9.3.1.24		YES	ignore
Allowed NSSAI	0		9.3.1.31	Indicates the S- NSSAIs permitted by the network	YES	ignore
UE Differentiation Information	0		9.3.1.144		YES	ignore

9.2.2.16 UE CONTEXT SUSPEND REQUEST

This message is sent by the NG-RAN node to request the AMF to suspend the UE context and the related PDU session contexts.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Information on Recommended Cells and RAN Nodes for Paging	0		9.3.1.100		YES	ignore
Paging Assistance Data for CE Capable UE	0		9.3.1.141		YES	ignore
PDU Session Resource Suspend List		01			YES	reject
>PDU Session Resource Suspend Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M	SIUIIS>	9.3.1.50			
>>UE Context Suspend Request Transfer	M		Containing the UE Context Suspend Request Transfer IE specified in subclause 9.3.4.26.		-	

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UF. Value is 256.

9.2.2.17 UE CONTEXT SUSPEND RESPONSE

This message is sent by the AMF to indicate to the NG-RAN node the UE context and the related PDU session contexts have been suspended.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
Security Context	0		9.3.1.88		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.2.18 UE CONTEXT SUSPEND FAILURE

This message is sent by the AMF to indicate to the NG-RAN node that suspension of the UE context has failed in the 5GC.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.2.19 UE CONTEXT RESUME REQUEST

This message is sent by the NG-RAN node to request the AMF to resume the UE-associated logical NG-connection and UE context.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description	\/=0	Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RRC Resume Cause	M		RRC		YES	ignore
			Establishment			
			Cause			
			9.3.1.111			
PDU Session Resource		01			YES	reject
Resume List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Resume		ofPDUSes				
Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>UE Context Resume	M		OCTET STRING	Containing the UE	-	
Request Transfer				Context Resume		
				Request Transfer		
				IE specified in		
				subclause 9.3.4.24		
PDU Session Resource		01			YES	reject
Failed to Resume List						-
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Failed to		ofPDUSes				
Resume Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>Cause	M		9.3.1.2		-	
Suspend Request	0		9.3.1.158		YES	ignore
Indication						
Information on	0		9.3.1.100		YES	ignore
Recommended Cells and						Ŭ
RAN Nodes for Paging						
Paging Assistance Data	0		9.3.1.141		YES	ignore
for CE Capable UE						

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.2.20 UE CONTEXT RESUME RESPONSE

This message is sent by the AMF to indicate to the NG-RAN node that the UE context and the related PDU session contexts have been resumed in the 5GC.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	description	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	
RAN UE NGAP ID					YES	ignore
	М	0.4	9.3.3.2			ignore · ·
PDU Session Resource		01			YES	reject
Resume List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Resume Item		ofPDUSes				
		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>UE Context Resume	M		OCTET STRING	Containing the <i>UE</i>	-	
Response Transfer				Context Resume		
				Response Transfer		
				IE specified in		
				subclause 9.3.4.25		
PDU Session Resource		01			YES	reject
Failed to Resume List						,
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Failed to		ofPDUSes				
Resume Item		sions>				
>>PDU Session ID	М		9.3.1.50		-	
>>Cause	М		9.3.1.2		-	
Security Context	0		9.3.1.88		YES	reject
Suspend Response	0		9.3.1.159		YES	ignore
Indication						
Extended Connected	0		9.3.3.31		YES	ignore
Time						
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation		
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.		

9.2.2.21 UE CONTEXT RESUME FAILURE

This message is sent by the AMF to indicate to the NG-RAN node that resumption of the UE context and the related PDU session contexts has failed in the 5GC.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
RAN UE NGAP ID	М		9.3.3.2		YES	ignore
Cause	М		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.3 UE Mobility Management Messages

9.2.3.1 HANDOVER REQUIRED

This message is sent by the source NG-RAN node to the AMF to request the preparation of resources at the target.

Direction: NG-RAN node \rightarrow AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Handover Type	M		9.3.1.22		YES	reject
Cause	M		9.3.1.2		YES	ignore
Target ID	M		9.3.1.25		YES	reject
Direct Forwarding Path Availability	0		9.3.1.64		YES	ignore
PDU Session Resource List		1			YES	reject
>PDU Session Resource Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>Handover Required Transfer	M		OCTET STRING	Containing the Handover Required Transfer IE specified in subclause 9.3.4.14.	-	
Source to Target Transparent Container	М		9.3.1.20		YES	reject

Range bound	Explanation			
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.			

9.2.3.2 HANDOVER COMMAND

This message is sent by the AMF to inform the source NG-RAN node that resources for the handover have been prepared at the target side.

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
- T			reference	description	\/50	Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Handover Type	M		9.3.1.22		YES	reject
NAS Security	C-		9.3.3.26		YES	reject
Parameters from NG-	iftoEPSUT					
RAN	RA					
PDU Session		01			YES	ignore
Resource Handover						
List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Handover		ofPDUSes				
Item		sions>				
>>PDU Session ID	M		9.3.1.50	 	-	
>>Handover	M		OCTET	Containing the	-	
Command Transfer			STRING	Handover		
				Command		
				Transfer IE		
				specified in		
				subclause		
DDII O i		0.4		9.3.4.10.	VE0	
PDU Session Resource to Release		01			YES	ignore
List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource to Release		ofPDUSes				
Item		sions>				
>>PDU Session ID	М		9.3.1.50		-	
>>Handover	М		OCTET	Containing the	-	
Preparation			STRING	Handover		
Unsuccessful				Preparation		
Transfer				Unsuccessful		
				Transfer IE		
				specified in		
				subclause		
				9.3.4.18.		
Target to Source	M		9.3.1.21		YES	reject
Transparent Container						
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

Condition	Explanation
iftoEPSUTRA	This IE shall be present if the Handover Type IE is set to the value
	"5GStoEPS" or "5GtoUTRA".

9.2.3.3 HANDOVER PREPARATION FAILURE

This message is sent by the AMF to inform the source NG-RAN node that the Handover Preparation has failed.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
RAN UE NGAP ID	М		9.3.3.2		YES	ignore
Cause	М		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore
Target to Source Failure	0		9.3.1.186		YES	ignore
Transparent Container						

9.2.3.4 HANDOVER REQUEST

This message is sent by the AMF to the target NG-RAN node to request the preparation of resources.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1	description	YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
Handover Type	M		9.3.1.22		YES	reject
Cause	M		9.3.1.2		YES	ignore
UE Aggregate Maximum Bit Rate	M		9.3.1.58		YES	reject
Core Network Assistance Information for RRC INACTIVE	0		9.3.1.15		YES	ignore
UE Security Capabilities	М		9.3.1.86		YES	reject
Security Context	М		9.3.1.88		YES	reject
New Security Context Indicator	0		9.3.1.55		YES	reject
NASC	0		NAS-PDU 9.3.3.4	Refers to either the "Intra N1 mode NAS transparent container" or the "S1 mode to N1 mode NAS transparent container", the details of the IE definition and the encoding arespecified in TS 24.501 [26].	YES	reject
PDU Session Resource Setup List		1			YES	reject
>PDU Session Resource Setup Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>S-NSSAI	М		9.3.1.24		-	
>>Handover Request Transfer	М		OCTET STRING	Containing the PDU Session Resource Setup Request Transfer IE specified in subclause 9.3.4.1.	-	
>>PDU Session Expected UE Activity Behaviour	0		Expected UE Activity Behaviour 9.3.1.94	Expected UE Activity Behaviour for the PDU Session.	YES	ignore
Allowed NSSAI	М		9.3.1.31	Indicates the S- NSSAIs permitted by the network.	YES	reject
Trace Activation	0		9.3.1.14		YES	ignore
Masked IMEISV	0		9.3.1.54		YES	ignore
Source to Target Transparent Container	М		9.3.1.20		YES	reject
Mobility Restriction List	0		9.3.1.85		YES	ignore
Location Reporting Request Type	0		9.3.1.65		YES	ignore
RRC Inactive Transition Report Request	0		9.3.1.91		YES	ignore
GUAMI	M		9.3.3.3		YES	reject
Redirection for Voice EPS Fallback	0		9.3.1.116		YES	ignore
CN Assisted RAN	0		9.3.1.119		YES	ignore
Parameters Tuning SRVCC Operation Possible	0		9.3.1.128		YES	ignore
IAB Authorized	0		9.3.1.129		YES	reject
Enhanced Coverage	0		9.3.1.129		YES	reject ignore
Restriction			J.U. 1. 140		ILO	ignole

UE Differentiation	0	9.3.1.144		YES	ignore
Information					_
NR V2X Services Authorized	0	9.3.1.146		YES	ignore
LTE V2X Services Authorized	0	9.3.1.147		YES	ignore
NR UE Sidelink Aggregate Maximum Bit Rate	0	9.3.1.148	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
LTE UE Sidelink Aggregate Maximum Bit Rate	0	9.3.1.149	This IE applies only if the UE is authorized for LTE V2X services.	YES	ignore
PC5 QoS Parameters	0	9.3.1.150	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
CE-mode-B Restricted	0	9.3.1.155		YES	ignore
UE User Plane CloT Support Indicator	0	9.3.1.160		YES	ignore
Management Based MDT PLMN List	0	MDT PLMN List 9.3.1.168		YES	ignore
UE Radio Capability ID	0	9.3.1.142		YES	reject
Extended Connected Time	0	9.3.3.31		YES	ignore
Time Synchronisation Assistance Information	0	9.3.1.220		YES	ignore
UE Slice Maximum Bit Rate List	0	9.3.1.231		YES	ignore
5G ProSe Authorized	0	9.3.1.233		YES	ignore
5G ProSe UE PC5 Aggregate Maximum Bit Rate	0	NR UE Sidelink Aggregate Maximum Bit Rate 9.3.1.148	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore
5G ProSe PC5 QoS Parameters	0	9.3.1.234	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.3.5 HANDOVER REQUEST ACKNOWLEDGE

This message is sent by the target NG-RAN node to inform the AMF about the prepared resources at the target.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2	Allocated at the target NG-RAN node.	YES	ignore
PDU Session Resource Admitted List		1			YES	ignore
>PDU Session Resource Admitted Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>Handover Request Acknowledge Transfer	М		OCTET STRING	Containing the Handover Request Acknowledge Transfer IE specified in subclause 9.3.4.11.	-	
PDU Session Resource Failed to Setup List		01			YES	ignore
>PDU Session Resource Failed to Setup Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>Handover Resource Allocation Unsuccessful Transfer	M		OCTET STRING	Containing the Handover Resource Allocation Unsuccessful Transfer IE specified in subclause 9.3.4.19.	-	
Target to Source	M		9.3.1.21		YES	reject
Transparent Container						
Criticality Diagnostics	0		9.3.1.3		YES	ignore
NPN Access Information	0		9.3.3.46		YES	reject
RedCap Indication	0		9.3.1.228		YES	ignore

Range bound	Explanation		
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.		

9.2.3.6 HANDOVER FAILURE

This message is sent by the target NG-RAN node to inform the AMF that the preparation of resources has failed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
Cause	М		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore
Target to Source Failure	0		9.3.1.186		YES	ignore
Transparent Container						

9.2.3.7 HANDOVER NOTIFY

This message is sent by the target NG-RAN node to inform the AMF that the UE has been identified in the target cell and the handover has been completed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
User Location Information	М		9.3.1.16		YES	ignore
Notify Source NG-RAN Node	О		ENUMERATED (NotifySource,)		YES	ignore

9.2.3.8 PATH SWITCH REQUEST

This message is sent by the NG-RAN node to inform the AMF of the new serving NG-RAN node and to transfer some NG-U DL tunnel termination point(s) to the SMF via the AMF for one or multiple PDU session resources.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Source AMF UE NGAP	M		AMF UE NGAP		YES	reject
ID			ID			
			9.3.3.1			
User Location	M		9.3.1.16		YES	ignore
Information						
UE Security Capabilities	M		9.3.1.86		YES	ignore
PDU Session		1			YES	reject
Resource to be						
Switched in Downlink						
List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource to be		ofPDUSes				
Switched in Downlink		sions>				
Item						
>>PDU Session ID	M		9.3.1.50		-	
>>Path Switch	М		OCTET	Containing the	-	
Request Transfer			STRING	Path Switch		
				Request Transfer		
				IE specified in		
PDU Session		01		subclause 9.3.4.8.	\/F0	
		01			YES	ignore
Resource Failed to Setup List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Failed to		ofPDUSes				
Setup Item		sions>				
>>PDU Session ID	М		9.3.1.50		-	
>>Path Switch	М		OCTET	Containing the	-	
Request Setup Failed			STRING	Path Switch		
Transfer				Request Setup		
				Failed Transfer IE		
				specified in		
				subclause		
DDC Desume Court			RRC	9.3.4.15.	VEC	:
RRC Resume Cause	0		Establishment		YES	ignore
			Cause 9.3.1.111			
RedCap Indication	0		9.3.1.228	1	YES	ignoro
neucap indication	U		3.3.1.220		IEO	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.3.9 PATH SWITCH REQUEST ACKNOWLEDGE

This message is sent by the AMF to inform the NG-RAN node that the path switch has been successfully completed in the 5GC.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	ignore
RAN UE NGAP ID	М		9.3.3.2		YES	ignore
UE Security Capabilities	0		9.3.1.86		YES	reject
Security Context	M		9.3.1.88		YES	reject
New Security Context Indicator	0		9.3.1.55		YES	reject
PDU Session Resource		1			YES	ignore
Switched List		4				
>PDU Session Resource Switched Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	М		9.3.1.50		-	
>>Path Switch Request Acknowledge Transfer	M		OCTET STRING	Containing the Path Switch Request Acknowledge Transfer IE specified in subclause 9.3.4.9.	-	
>>PDU Session Expected UE Activity Behaviour	0		Expected UE Activity Behaviour 9.3.1.94	Expected UE Activity Behaviour for the PDU Session.	YES	ignore
PDU Session Resource Released List		01	0.0.1.01	CCCCICII.	YES	ignore
>PDU Session Resource Released		1 <maxno ofPDUSes</maxno 			-	
>>PDU Session ID	M	sions>	9.3.1.50		_	
>>Path Switch Request Unsuccessful Transfer	M		OCTET STRING	Containing the Path Switch Request Unsuccessful Transfer IE specified in subclause 9.3.4.20.	-	
Allowed NSSAI	М		9.3.1.31	Indicates the S- NSSAIs permitted by the network.	YES	reject
Core Network Assistance Information for RRC INACTIVE	0		9.3.1.15		YES	ignore
RRC Inactive Transition Report Request	0		9.3.1.91		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore
Redirection for Voice EPS Fallback	0		9.3.1.116		YES	ignore
CN Assisted RAN Parameters Tuning	0		9.3.1.119		YES	ignore
SRVCC Operation Possible	0		9.3.1.128		YES	ignore
Enhanced Coverage Restriction	0		9.3.1.140		YES	ignore
Extended Connected Time	0		9.3.3.31		YES	ignore
UE Differentiation Information	0		9.3.1.144		YES	ignore
NR V2X Services Authorized	0		9.3.1.146		YES	ignore
LTE V2X Services Authorized	0		9.3.1.147		YES	ignore

NR UE Sidelink Aggregate Maximum Bit Rate	0	9.3.1.148	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
LTE UE Sidelink Aggregate Maximum Bit Rate	0	9.3.1.149	This IE applies only if the UE is authorized for LTE V2X services.	YES	ignore
PC5 QoS Parameters	0	9.3.1.150	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
CE-mode-B Restricted	0	9.3.1.155		YES	ignore
UE User Plane CloT Support Indicator	0	9.3.1.160		YES	ignore
UE Radio Capability ID	0	9.3.1.142		YES	reject
Management Based MDT PLMN List	0	MDT PLMN List 9.3.1.168		YES	ignore
Time Synchronisation Assistance Information	0	9.3.1.220		YES	ignore
5G ProSe Authorized	0	9.3.1.233		YES	ignore
5G ProSe UE PC5 Aggregate Maximum Bit Rate	0	NR UE Sidelink Aggregate Maximum Bit Rate 9.3.1.148	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore
5G ProSe PC5 QoS Parameters	0	9.3.1.234	This IE applies only if the UE is authorized for 5G ProSe services.	YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.3.10 PATH SWITCH REQUEST FAILURE

This message is sent by the AMF to inform the NG-RAN node that a failure has occurred in the 5GC during the Path Switch Request procedure.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session		1			YES	ignore
Resource Released						
List						
>PDU Session Resource Released Item		1 <maxno ofPDUSes sions></maxno 			-	
>>PDU Session ID	M		9.3.1.50		-	
>>Path Switch Request Unsuccessful Transfer	M		OCTET STRING	Containing the PDU session Path Switch Request Unsuccessful Transfer IE specified in subclause 9.3.4.20.	-	
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.3.11 HANDOVER CANCEL

This message is sent by the source NG-RAN node to the AMF to request the cancellation of an ongoing handover.

Direction: NG-RAN node \rightarrow AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.3.12 HANDOVER CANCEL ACKNOWLEDGE

This message is sent by the AMF to the source NG-RAN node to confirm that the ongoing handover was cancelled.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.3.13 UPLINK RAN STATUS TRANSFER

This message is sent by the source NG-RAN node to transfer the uplink PDCP-SN and HFN receiver status and the downlink PDCP SN and HFN transmitter status during intra 5GC NG-based handover.

Direction: NG-RAN node \rightarrow AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RAN Status Transfer Transparent Container	М		9.3.1.108		YES	reject

9.2.3.14 DOWNLINK RAN STATUS TRANSFER

This message is sent by the AMF to the target NG-RAN node to transfer the uplink PDCP-SN and HFN receiver status and the downlink PDCP SN and HFN transmitter status during intra 5GC NG-based handover.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
RAN Status Transfer Transparent Container	М		9.3.1.108		YES	reject

9.2.3.15 HANDOVER SUCCESS

This message is sent by the AMF to the source NG-RAN node to indicate the successful access of the UE toward the target NG-RAN node.

Direction: AMF \rightarrow NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject

9.2.3.16 UPLINK RAN EARLY STATUS TRANSFER

This message is sent by the source NG-RAN node to transfer the COUNT value(s) of the first forwarded downlink SDU(s) during NG DAPS Handover.

Direction: NG-RAN node \rightarrow AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Early Status Transfer Transparent Container	М		9.3.1.190		YES	reject

9.2.3.17 DOWNLINK RAN EARLY STATUS TRANSFER

This message is sent by the AMF to transfer the COUNT value(s) of the first forwarded downlink SDU(s) during NG DAPS Handover.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Early Status Transfer Transparent Container	М		9.3.1.190		YES	reject

9.2.4 Paging Messages

9.2.4.1 PAGING

This message is sent by the AMF and is used to page a UE in one or several tracking areas.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
UE Paging Identity	M		9.3.3.18		YES	ignore
Paging DRX	0		9.3.1.90		YES	ignore
TAI List for Paging		1			YES	ignore
>TAI List for Paging Item		1 <maxno ofTAlforPa ging></maxno 			-	
>>TAI	М	<i>99</i> .	9.3.3.11		-	
Paging Priority	0		9.3.1.78		YES	ignore
UE Radio Capability for Paging	0		9.3.1.68		YES	ignore
Paging Origin	0		9.3.3.22		YES	ignore
Assistance Data for Paging	0		9.3.1.69		YES	ignore
NB-IoT Paging eDRX Information	0		9.3.1.138		YES	ignore
NB-IoT Paging DRX	0		9.3.1.139	If this IE is present, the <i>Paging DRX</i> IE is ignored.	YES	ignore
Enhanced Coverage Restriction	0		9.3.1.140		YES	ignore
WUS Assistance Information	0		9.3.1.143		YES	ignore
E-UTRA Paging eDRX Information	0		9.3.1.154		YES	ignore
CE-mode-B Restricted	0		9.3.1.155		YES	ignore
NR Paging eDRX Information	0		9.3.1.227		YES	ignore
Paging Cause	0		ENUMERATED (voice,)		YES	ignore
PEIPS Assistance Information	0		9.3.1.232		YES	ignore

Range bound	Explanation
maxnoofTAlforPaging	Maximum no. of TAIs for paging. Value is 16.

9.2.4.2 MULTICAST GROUP PAGING

This message is sent by the AMF and is used to notify involved UEs about the activation of a multicast session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	ignore
MBS Session ID	M		9.3.1.206		YES	ignore
MBS Service Area	0		9.3.1.208		YES	ignore
Multicast Group Paging Area List		1			YES	ignore
>Multicast Group Paging Area Item		1 <maxno ofPagingA reas></maxno 			-	
>>Multicast Group Paging Area	М		9.3.1.216		-	
>>UE Paging List		01			-	
>>>UE Paging Item		1 <maxno ofUEsforP aging></maxno 			-	
>>>>UE Identity Index Value	М		9.3.3.23		-	
>>>>Paging DRX	0		9.3.1.90		-	

Range bound	Explanation
maxnoofPagingAreas	Maximum no. of paging areas for multicast group paging. Value is 64.
maxnoofUEsforPaging	Maximum no. of UEs allowed within one paging area for multicast group paging. Value is 4096.

9.2.5 NAS Transport Messages

9.2.5.1 INITIAL UE MESSAGE

This message is sent by the NG-RAN node to transfer the initial layer 3 message to the AMF over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1	·	YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NAS-PDU	M		9.3.3.4		YES	reject
User Location Information	М		9.3.1.16		YES	reject
RRC Establishment Cause	М		9.3.1.111		YES	ignore
5G-S-TMSI	0		9.3.3.20		YES	reject
AMF Set ID	0		9.3.3.12		YES	ignore
UE Context Request	0		ENUMERATED (requested,)		YES	ignore
Allowed NSSAI	0		9.3.1.31		YES	reject
Source to Target AMF Information Reroute	0		9.3.3.27		YES	ignore
Selected PLMN Identity	0		PLMN Identity 9.3.3.5	Indicates the selected PLMN id for the non-3GPP access.	YES	ignore
IAB Node Indication	0		ENUMERATED (true,)	Indication of an IAB node	YES	reject
CE-mode-B Support Indicator	0		9.3.1.156		YES	reject
LTE-M Indication	0		9.3.1.157		YES	ignore
EDT Session	0		ENUMERATED (true,)		YES	ignore
Authenticated Indication	0		ENUMERATED (true,)	Indicates the FN- RG has been authenticated by the access network.	YES	ignore
NPN Access Information	0		9.3.3.46		YES	reject
RedCap Indication	0		9.3.1.228		YES	ignore

9.2.5.2 DOWNLINK NAS TRANSPORT

This message is sent by the AMF and is used for carrying NAS information over the NG interface.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	ignore
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	М		9.3.3.2		YES	reject
Old AMF	0		AMF Name 9.3.3.21		YES	reject
RAN Paging Priority	0		9.3.3.15		YES	ignore
NAS-PDU	М		9.3.3.4		YES	reject
Mobility Restriction List	0		9.3.1.85		YES	ignore
Index to RAT/Frequency Selection Priority	0		9.3.1.61		YES	ignore
UE Aggregate Maximum Bit Rate	0		9.3.1.58		YES	ignore
Allowed NSSAI	0		9.3.1.31	Indicates the S- NSSAIs permitted by the network.	YES	reject
SRVCC Operation Possible	0		9.3.1.128		YES	ignore
Enhanced Coverage Restriction	0		9.3.1.140		YES	ignore
Extended Connected Time	0		9.3.3.31		YES	ignore
UE Differentiation Information	0		9.3.1.144		YES	ignore
CE-mode-B Restricted	0		9.3.1.155		YES	ignore
UE Radio Capability	0		9.3.1.74		YES	ignore
UE Capability Info Request	0		9.3.1.192		YES	ignore
End Indication	0		9.3.3.32		YES	ignore
UE Radio Capability ID	0		9.3.1.142		YES	reject
Target NSSAI Information	0		9.3.1.229		YES	ignore

9.2.5.3 UPLINK NAS TRANSPORT

This message is sent by the NG-RAN node and is used for carrying NAS information over the NG interface.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NAS-PDU	M		9.3.3.4		YES	reject
User Location Information	M		9.3.1.16		YES	ignore
W-AGF Identity Information	0		OCTET STRING	Containing the WAgfInfo IE specified in TS 29.510 [36].	YES	reject
TNGF Identity Information	0		OCTET STRING	Containing the TngfInfo IE specified in TS 29.510 [36].	YES	reject
TWIF Identity Information	0		OCTET STRING	Containing the TwifInfo IE specified in TS 29.510 [36].	YES	reject

9.2.5.4 NAS NON DELIVERY INDICATION

This message is sent by the NG-RAN node and is used for reporting the non-delivery of a NAS PDU previously received within a DOWNLINK NAS TRANSPORT message or the *NAS-PDU* IE previously received within the PDU SESSION RESOURCE SETUP REQUEST message over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NAS-PDU	M		9.3.3.4		YES	ignore
Cause	M		9.3.1.2		YES	ignore

9.2.5.5 REROUTE NAS REQUEST

This message is sent by the AMF in order to request for a rerouting of the INITIAL UE MESSAGE to another AMF.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	•	YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
AMF UE NGAP ID	0		9.3.3.1		YES	ignore
NGAP Message	M		OCTET STRING	Contains the INITIAL UE MESSAGE	YES	reject
AMF Set ID	M		9.3.3.12		YES	reject
Allowed NSSAI	0		9.3.1.31		YES	reject
Source to Target AMF Information Reroute	0		9.3.3.27		YES	ignore

9.2.6 Interface Management Messages

9.2.6.1 NG SETUP REQUEST

This message is sent by the NG-RAN node to transfer application layer information for an NG-C interface instance.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Global RAN Node ID	M		9.3.1.5		YES	reject
RAN Node Name	0		PrintableString (SIZE(1150,))		YES	ignore
Supported TA List		1		Supported TAs in the NG-RAN node.	YES	reject
>Supported TA Item		1 <maxno ofTACs></maxno 			-	
>>TAC	M		9.3.3.10	Broadcast TAC	-	
>>Broadcast PLMN List		1			-	
>>>Broadcast PLMN Item		1 <maxno ofBPLMNs ></maxno 			-	
>>>>PLMN Identity	M		9.3.3.5	Broadcast PLMN	-	
>>>>TAI Slice Support List	M		Slice Support List 9.3.1.17	Supported S- NSSAIs per TAC, per PLMN or per SNPN.	-	
>>>>NPN Support	0		9.3.3.44	If the NID IE is included, it identifies a SNPN together with the PLMN Identity IE.	YES	reject
>>>>Extended TAI Slice Support List	0		Extended Slice Support List 9.3.1.191	Additional Supported S- NSSAIs per TAC, per PLMN or per SNPN.	YES	reject
>>>>TAI NSAG Support List	0		9.3.1.238	NSAG information associated with the slices per TAC, per PLMN or per SNPN.	YES	ignore
>>Configured TAC Indication	0		9.3.3.50		YES	ignore
>>RAT Information	0		9.3.1.125	RAT information associated with the TAC of the indicated PLMN(s).	YES	reject
Default Paging DRX	М		Paging DRX 9.3.1.90		YES	ignore
UE Retention Information	0		9.3.1.117		YES	ignore
NB-IoT Default Paging DRX	0		9.3.1.137		YES	ignore
Extended RAN Node Name	0		9.3.1.193		YES	ignore

Range bound	Explanation
maxnoofTACs	Maximum no. of TACs. Value is 256.
maxnoofBPLMNs	Maximum no. of Broadcast PLMNs. Value is 12.

9.2.6.2 NG SETUP RESPONSE

This message is sent by the AMF to transfer application layer information for an NG-C interface instance.

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
AMF Name	M		9.3.3.21		YES	reject
Served GUAMI List		1			YES	reject
>Served GUAMI Item		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
		ofServedG				
		UAMIs>				
>>GUAMI	M		9.3.3.3		-	
>>Backup AMF Name	0		AMF Name		-	
•			9.3.3.21			
>>GUAMI Type	0		ENUMERATED		YES	ignore
			(native, mapped,			
)			
Relative AMF Capacity	М		9.3.1.32		YES	ignore
PLMN Support List		1			YES	reject
>PLMN Support Item		1 <maxno< td=""><td></td><td></td><td>-</td><td>•</td></maxno<>			-	•
••		ofPLMNs>				
>>PLMN Identity	М		9.3.3.5		-	
>>Slice Support List	М		9.3.1.17	Supported S-	-	
11				NSSAIs per PLMN		
				or per SNPN.		
>>NPN Support	0		9.3.3.44	If NID IE is	YES	reject
''				included, it		,
				identifies a SNPN		
				together with the		
				PLMN Identity IE.		
>>Extended Slice	0		9.3.1.191	Additional	YES	reject
Support List				Supported S-		,
				NSSAIs per PLMN		
				or per SNPN.		
>>Onboarding Support	0		ENUMERATED	Indication of	YES	ignore
3 :			(true,)	onboarding		5
			, , ,	support.		
Criticality Diagnostics	0		9.3.1.3		YES	ignore
UE Retention Information	0		9.3.1.117		YES	ignore
IAB Supported	0		ENUMERATED	Indication of	YES	ignore
-			(true,)	support for IAB.]
Extended AMF Name	0		9.3.3.51		YES	ignore

Range bound	Explanation
maxnoofServedGUAMIs	Maximum no. of GUAMIs served by an AMF. Value is 256.
maxnoofPLMNs	Maximum no. of PLMNs per message. Value is 12.

9.2.6.3 NG SETUP FAILURE

This message is sent by the AMF to indicate NG setup failure.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Cause	М		9.3.1.2		YES	ignore
Time to Wait	0		9.3.1.56		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.6.4 RAN CONFIGURATION UPDATE

This message is sent by the NG-RAN node to transfer updated application layer information for an NG-C interface instance.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
RAN Node Name	0		PrintableString (SIZE(1150,))		YES	ignore
Supported TA List		01		Supported TAs in the NG-RAN node.	YES	reject
>Supported TA Item		1 <maxno ofTACs></maxno 			ı	
>>TAC	М		9.3.3.10	Broadcast TAC	-	
>>Broadcast PLMN List		1			-	
>>>Broadcast PLMN Item		1 <maxno ofBPLMNs ></maxno 			ı	
>>>>PLMN Identity	М		9.3.3.5	Broadcast PLMN	-	
>>>>TAI Slice Support List	M		Slice Support List 9.3.1.17	Supported S- NSSAIs per TAC, per PLMN or per SNPN.	-	
>>>>NPN Support	0		9.3.3.44	If the NID IE is included, it identifies a SNPN together with the PLMN Identity IE.	YES	reject
>>>>Extended TAI Slice Support List	0		Extended Slice Support List 9.3.1.191	Additional Supported S- NSSAIs per TAC, per PLMN or per SNPN.	YES	reject
>>>>TAI NSAG Support List	0		9.3.1.238	NSAG information associated with the slices per TAC, per PLMN or per SNPN.	YES	ignore
>>Configured TAC Indication	0		9.3.3.50		YES	ignore
>>RAT Information	0		9.3.1.125	RAT information associated with the TAC of the indicated PLMN(s).	YES	reject
Default Paging DRX	0		Paging DRX 9.3.1.90		YES	ignore
Global RAN Node ID	0		9.3.1.5		YES	ignore
NG-RAN TNL Association to Remove List		01			YES	reject
>NG-RAN TNL Association to Remove Item		1 <maxno ofTNLAss ociations></maxno 			-	
>>TNL Association Transport Layer Address	M		CP Transport Layer Information 9.3.2.6	Transport layer address of the NG-RAN node.	-	
>>TNL Association Transport Layer Address at AMF	0		CP Transport Layer Information 9.3.2.6	Transport layer address of the AMF.	-	
NB-IoT Default Paging DRX	0		9.3.1.137		YES	ignore
Extended RAN Node Name	0		9.3.1.193		YES	ignore

Range bound	Explanation
maxnoofTACs	Maximum no. of TACs. Value is 256.
maxnoofBPLMNs	Maximum no. of Broadcast PLMNs. Value is 12.
maxnoofTNLAssociations	Maximum no. of TNL Associations between the NG-RAN node and the AMF. Value is 32.

9.2.6.5 RAN CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by the AMF to acknowledge the NG-RAN node transfer of updated information for an NG-C interface instance.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.6.6 RAN CONFIGURATION UPDATE FAILURE

This message is sent by the AMF to indicate RAN configuration update failure.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time to Wait	0		9.3.1.56		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.6.7 AMF CONFIGURATION UPDATE

This message is sent by the AMF to transfer updated information for an NG-C interface instance.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
AMF Name	0		9.3.3.21		YES	reject
Served GUAMI List		01			YES	reject
>Served GUAMI Item		1 <maxno ofServedG UAMIs></maxno 			-	,
>>GUAMI	M		9.3.3.3		-	
>>Backup AMF Name	0		AMF Name 9.3.3.21		-	
>>GUAMI Type	0		ENUMERATED (native, mapped,)		YES	ignore
Relative AMF Capacity	0		9.3.1.32		YES	ignore
PLMN Support List		01			YES	reject
>PLMN Support Item		1 <maxno ofPLMNs></maxno 			-	,
>>PLMN Identity	М		9.3.3.5		-	
>>Slice Support List	М		9.3.1.17	Supported S- NSSAIs per PLMN or per SNPN.	-	
>>NPN Support	0		9.3.3.44	If the NID IE is included, it identifies a SNPN together with the PLMN Identity IE.	YES	reject
>>Extended Slice Support List	0		9.3.1.191	Additional Supported S- NSSAIs per PLMN or per SNPN.	YES	reject
>>Onboarding Support	0		ENUMERATED (true,)	Indication of onboarding support.	YES	ignore
AMF TNL Association to Add List		01		Саррана	YES	ignore
>AMF TNL Association to Add Item		1 <maxno ofTNLAss ociations></maxno 			-	
>>AMF TNL Association Address	М		CP Transport Layer Information 9.3.2.6	AMF Transport Layer information used to set up the new TNL association.	-	
>>TNL Association Usage	0		9.3.2.9	association.	-	
>>TNL Address Weight Factor	М		9.3.2.10		-	
AMF TNL Association to Remove List		01			YES	ignore
>AMF TNL Association to Remove Item		1 <maxno ofTNLAss ociations></maxno 			-	
>>AMF TNL Association Address	M		CP Transport Layer Information 9.3.2.6	Transport Layer Address of the AMF.	-	
>>TNL Association Transport Layer Address NG-RAN	0		CP Transport Layer Address 9.3.2.6	Transport Layer Address of the NG- RAN node.	YES	reject
AMF TNL Association to Update List		01		-	YES	ignore
>AMF TNL Association to Update Item		1 <maxno ofTNLAss ociations></maxno 			-	

>>AMF TNL	М	CP Transport	AMF Transport	-	
Association Address		Layer Information 9.3.2.6	Layer information used to identify the TNL association to be updated.		
>>TNL Association	0	9.3.2.9		-	
Usage					
>>TNL Address Weight	0	9.3.2.10		-	
Factor					
Extended AMF Name	0	9.3.3.51		YES	ignore

Range bound	Explanation
maxnoofServedGUAMIs	Maximum no. of GUAMIs served by an AMF. Value is 256.
maxnoofPLMNs	Maximum no. of PLMNs per message. Value is 12.
maxnoofTNLAssociations	Maximum no. of TNL Associations between the NG-RAN node and the AMF.
	Value is 32.

9.2.6.8 AMF CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by the NG-RAN node to acknowledge the AMF transfer of updated information for an NG-C interface instance.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
AMF TNL Association		01			YES	ignore
Setup List						
>AMF TNL		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Association Setup		ofTNLAss				
Item		ociations>				
>>AMF TNL	М		CP Transport	Previously	-	
Association Address			Layer	received AMF		
			Information	Transport Layer		
			9.3.2.6	information for the		
				TNL association.		
AMF TNL Association	0		TNL		YES	ignore
Failed to Setup List			Association List			
			9.3.2.7			
Criticality Diagnostics	0		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofTNLAssociations	Maximum no. of TNL Associations between the NG-RAN node and the
	AMF. Value is 32.

9.2.6.9 AMF CONFIGURATION UPDATE FAILURE

This message is sent by the NG-RAN node to indicate AMF configuration update failure.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time to Wait	0		9.3.1.56		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.6.10 AMF STATUS INDICATION

This message is sent by the AMF to support AMF management functions.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Unavailable GUAMI List		1		Indicates the GUAMIs configured to be unavailable at the AMF	YES	reject
>Unavailable GUAMI Item		1 <maxno ofServedG UAMIs></maxno 			-	
>>GUAMI	M		9.3.3.3		-	
>>Timer Approach for GUAMI Removal	0		ENUMERATED (apply timer,)		-	
>>Backup AMF Name	0		AMF Name 9.3.3.21		-	

Range bound	Explanation			
maxnoofServedGUAMIs	Maximum no. of GUAMIs served by an AMF. Value is 256.			

9.2.6.11 NG RESET

This message is sent by both the NG-RAN node and the AMF to request that the NG interface, or parts of the NG interface, be reset.

Direction: NG-RAN node \rightarrow AMF and AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Cause	M		9.3.1.2		YES	ignore
CHOICE Reset Type	M				YES	reject
>NG interface						
>>Reset All	М		ENUMERATED (Reset all,)		-	
>Part of NG interface						
>>UE-associated Logical NG- connection List	М		9.3.3.25		-	

9.2.6.12 NG RESET ACKNOWLEDGE

This message is sent by both the NG-RAN node and the AMF as a response to an NG RESET message.

Direction: NG-RAN node \rightarrow AMF and AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
UE-associated Logical	0		9.3.3.25		YES	ignore
NG-connection List						-
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.6.13 ERROR INDICATION

This message is sent by both the NG-RAN node and the AMF to indicate that some error has been detected in the node.

Direction: NG-RAN node \rightarrow AMF and AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	0		9.3.3.1		YES	ignore
RAN UE NGAP ID	0		9.3.3.2		YES	ignore
Cause	0		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore
5G-S-TMSI	0		9.3.3.20		YES	ignore

9.2.6.14 OVERLOAD START

This message is sent by the AMF and is used to indicate to the NG-RAN node that the AMF is overloaded.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF Overload	0		Overload		YES	reject
Response			Response			
			9.3.1.104			
AMF Traffic Load	0		Traffic Load		YES	ignore
Reduction Indication			Reduction			
			Indication			
			9.3.1.106			
Overload Start NSSAI List		01			YES	ignore
>Overload Start		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
NSSAI Item		ofSliceIte				
		ms>				
>>Slice Overload List	M		9.3.1.107		-	
>>Slice Overload	0		Overload		-	
Response			Response			
			9.3.1.104			
>>Slice Traffic Load	0		Traffic Load		-	
Reduction Indication			Reduction			
			Indication			
			9.3.1.106			

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

9.2.6.15 OVERLOAD STOP

This message is sent by the AMF and is used to indicate that the AMF is no longer overloaded.

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

9.2.7 Configuration Transfer Messages

9.2.7.1 UPLINK RAN CONFIGURATION TRANSFER

This message is sent by the NG-RAN node in order to transfer RAN configuration information.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
SON Configuration Transfer	0		9.3.3.6		YES	ignore
EN-DC SON Configuration Transfer	0		OCTET STRING	Contains the EN- DC SON Configuration Transfer IE as defined in TS 36.413 [16].	YES	ignore
Inter-system SON Configuration Transfer	0		9.3.3.33		YES	ignore

9.2.7.2 DOWNLINK RAN CONFIGURATION TRANSFER

This message is sent by the AMF in order to transfer RAN configuration information.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
SON Configuration Transfer	0		9.3.3.6		YES	ignore
EN-DC SON Configuration Transfer	0		OCTET STRING	Contains the EN- DC SON Configuration Transfer IE as defined in TS 36.413 [16].	YES	ignore
Inter-system SON Configuration Transfer	0		9.3.3.33		YES	ignore

9.2.8 Warning Message Transmission Messages

9.2.8.1 WRITE-REPLACE WARNING REQUEST

This message is sent by the AMF to request the start or overwrite of the broadcast of a warning message.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Message Identifier	M		9.3.1.35		YES	reject
Serial Number	M		9.3.1.36		YES	reject
Warning Area List	0		9.3.1.37		YES	ignore
Repetition Period	M		9.3.1.49		YES	reject
Number of Broadcasts Requested	М		9.3.1.38		YES	reject
Warning Type	0		9.3.1.39		YES	ignore
Warning Security Information	0		OCTET STRING (SIZE(50))	This IE is not used in the specification. If received, the IE is ignored.	YES	ignore
Data Coding Scheme	0		9.3.1.41		YES	ignore
Warning Message Contents	0		9.3.1.42		YES	ignore
Concurrent Warning Message Indicator	0		9.3.1.46		YES	reject
Warning Area Coordinates	0		9.3.1.112		YES	ignore

9.2.8.2 WRITE-REPLACE WARNING RESPONSE

This message is sent by the NG-RAN node to acknowledge the AMF on the start or overwrite request of a warning message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Message Identifier	M		9.3.1.35		YES	reject
Serial Number	M		9.3.1.36		YES	reject
Broadcast Completed Area List	0		9.3.1.43		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.8.3 PWS CANCEL REQUEST

This message is forwarded by the AMF to the NG-RAN node to cancel an already ongoing broadcast of a warning message.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	М		9.3.1.1		YES	reject
Message Identifier	M		9.3.1.35		YES	reject
Serial Number	М		9.3.1.36		YES	reject
Warning Area List	0		9.3.1.37		YES	ignore
Cancel-All Warning	0		9.3.1.47		YES	reject
Messages Indicator						

9.2.8.4 PWS CANCEL RESPONSE

This message is sent by the NG-RAN node to indicate the list of warning areas where cancellation of the broadcast of the identified message was successful and unsuccessful.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	•	YES	reject
Message Identifier	M		9.3.1.35		YES	reject
Serial Number	M		9.3.1.36		YES	reject
Broadcast Cancelled Area List	0		9.3.1.44		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.8.5 PWS RESTART INDICATION

This message is sent by the NG-RAN node to inform the AMF that PWS information for some or all cells of the NG-RAN node are available for reloading from the CBC if needed.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
CHOICE Cell List for Restart	М				YES	reject
>E-UTRA						
>>E-UTRA Cell List for Restart		1 <maxno ofCellsinn geNB></maxno 			-	
>>>E-UTRA CGI	М		9.3.1.9		-	
>NR						
>>NR Cell List for Restart		1 <maxno ofCellsing NB></maxno 			-	
>>>NR CGI	М		9.3.1.7		-	
Global RAN Node ID	M		9.3.1.5		YES	reject
TAI List for Restart		1 <maxno ofTAlforR estart></maxno 			YES	reject
>TAI	M		9.3.3.11		-	
Emergency Area ID List for Restart		0 <maxno ofEAlforR estart></maxno 			YES	reject
>Emergency Area ID	М		9.3.1.48		-	

Range bound	Explanation
maxnoofCellsinngeNB	Maximum no. of cells that can be served by an ng-eNB. Value is 256.
maxnoofCellsingNB	Maximum no. of cells that can be served by a gNB. Value is 16384.
maxnoofTAlforRestart	Maximum no. of TAIs subject for reloading warning message broadcast. Value is 2048.
maxnoofEAlforRestart	Maximum no. of Emergency Area IDs subject for reloading warning message broadcast. Value is 256.

9.2.8.6 PWS FAILURE INDICATION

This message is sent by the NG-RAN node to inform the AMF that ongoing PWS operation for one or more cells of the NG-RAN node has failed.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	ignore
CHOICE PWS Failed	M				YES	reject
Cell List						
>E-UTRA						
>>PWS Failed E-		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
UTRA Cell List		ofCellsinn				
		geNB>				
>>>E-UTRA CGI	M		9.3.1.9		-	
>NR						
>>PWS Failed NR		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Cell List		ofCellsing				
		NB>				
>>>NR CGI	M		9.3.1.7		-	
Global RAN Node ID	M		9.3.1.5		YES	reject

Range bound	Explanation
maxnoofCellsinngeNB	Maximum no. of cells that can be served by an ng-eNB. Value is 256.
maxnoofCellsingNB	Maximum no. of cells that can be served by a gNB. Value is 16384.

9.2.9 NRPPa Transport Messages

9.2.9.1 DOWNLINK UE ASSOCIATED NRPPA TRANSPORT

This message is sent by the AMF and is used for carrying NRPPa message over the NG interface.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Routing ID	M		9.3.3.13		YES	reject
NRPPa-PDU	M		9.3.3.14		YES	reject

9.2.9.2 UPLINK UE ASSOCIATED NRPPA TRANSPORT

This message is sent by the NG-RAN node and is used for carrying NRPPa message over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Routing ID	M		9.3.3.13		YES	reject
NRPPa-PDU	M		9.3.3.14		YES	reject

9.2.9.3 DOWNLINK NON UE ASSOCIATED NRPPA TRANSPORT

This message is sent by the AMF and is used for carrying NRPPa message over the NG interface.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Routing ID	M		9.3.3.13		YES	reject
NRPPa-PDU	M		9.3.3.14		YES	reject

9.2.9.4 UPLINK NON UE ASSOCIATED NRPPA TRANSPORT

This message is sent by the NG-RAN node and is used for carrying NRPPa message over the NG interface.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Routing ID	M		9.3.3.13		YES	reject
NRPPa-PDU	M		9.3.3.14		YES	reject

9.2.10 Trace Messages

9.2.10.1 TRACE START

This message is sent by the AMF to initiate a trace session for a UE.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Trace Activation	М		9.3.1.14		YES	ignore

9.2.10.2 TRACE FAILURE INDICATION

This message is sent by the NG-RAN node to indicate that a Trace Start procedure or a Deactivate Trace procedure has failed for a UE.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NG-RAN Trace ID	M		OCTET STRING (SIZE(8))	As per NG-RAN Trace ID in <i>Trace</i> Activation IE	YES	ignore
Cause	M		9.3.1.2		YES	ignore

9.2.10.3 DEACTIVATE TRACE

This message is sent by the AMF to deactivate a trace session.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NG-RAN Trace ID	M		OCTET STRING (SIZE(8))	As per NG-RAN Trace ID in <i>Trace</i> Activation IE	YES	ignore

9.2.10.4 CELL TRAFFIC TRACE

This message is sent by the NG-RAN node to transfer trace specific information.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
NG-RAN Trace ID	M		OCTET STRING (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [11] (leftmost 6 octets, with PLMN information encoded as in 9.3.3.5), and Trace Recording Session Reference defined in TS 32.422 [11] (last 2 octets).	YES	ignore
NG-RAN CGI	M		9.3.1.73		YES	ignore
Trace Collection Entity IP Address	М		Transport Layer Address 9.3.2.4	For File based Reporting. Defined in TS 32.422 [11]. This IE is ignored if the <i>Trace</i> Collection Entity URI IE is present	YES	ignore
Privacy Indicator	0		ENUMERATED (Immediate MDT, Logged MDT,)		YES	ignore
Trace Collection Entity URI	0		URI 9.3.2.14	For Streaming based Reporting. Defined in TS 32.422 [11].	YES	ignore

9.2.11 Location Reporting Messages

9.2.11.1 LOCATION REPORTING CONTROL

This message is used by the AMF to request the NG-RAN node to report the location of the UE.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Location Reporting Request Type	М		9.3.1.65		YES	ignore

9.2.11.2 LOCATION REPORTING FAILURE INDICATION

This message is sent by the NG-RAN node and is used to indicate the failure of location reporting.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
Cause	М		9.3.1.2		YES	ignore

9.2.11.3 LOCATION REPORT

This message is used to provide the UE's location.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
User Location Information	М		9.3.1.16		YES	ignore
UE Presence in Area of Interest List	0		9.3.1.67		YES	ignore
Location Reporting Request Type	М		9.3.1.65	Contains the Location Reporting Request Type to which the Location Report refers.	YES	ignore

9.2.12 UE TNLA Binding Messages

9.2.12.1 UE TNLA BINDING RELEASE REQUEST

This message is sent by the AMF to request the NG-RAN node to release the TNLA binding for the respective UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject

9.2.13 UE Radio Capability Management Messages

9.2.13.1 UE RADIO CAPABILITY INFO INDICATION

This message is sent by the NG-RAN node to provide UE radio capability related information to the AMF.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	М		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
UE Radio Capability	M		9.3.1.74		YES	ignore
UE Radio Capability for Paging	0		9.3.1.68		YES	ignore
UE Radio Capability – E-UTRA Format	0		9.3.1.74a		YES	ignore

9.2.13.2 UE RADIO CAPABILITY CHECK REQUEST

This message is sent by the AMF to request the NG-RAN node to check the compatibility between the UE radio capabilities and network configuration on IMS voice.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	reject
RAN UE NGAP ID	M		9.3.3.2		YES	reject
UE Radio Capability	0		9.3.1.74		YES	ignore
UE Radio Capability ID	0		9.3.1.142		YES	reject

9.2.13.3 UE RADIO CAPABILITY CHECK RESPONSE

This message is sent by the NG-RAN node to report IMS voice compatibility between the UE radio capabilities and network configuration.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
IMS Voice Support Indicator	М		9.3.1.89		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.13.4 UE RADIO CAPABILITY ID MAPPING REQUEST

This message is sent by the NG-RAN node to request the AMF to provide mapping information for the indicated UE Radio Capability ID.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
UE Radio Capability ID	M		9.3.1.142		YES	reject

9.2.13.5 UE RADIO CAPABILITY ID MAPPING RESPONSE

This message is sent by the AMF to provide UE Radio Capability information which is mapped to the UE Radio Capability ID indicated by the NG-RAN node in the UE RADIO CAPABILITY ID MAPPING REQUEST message.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
UE Radio Capability ID	M		9.3.1.142		YES	reject
UE Radio Capability	M		9.3.1.74		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.14 Data Usage Reporting Messages

9.2.14.1 SECONDARY RAT DATA USAGE REPORT

This message is sent by the NG-RAN node to report Secondary RAT data usage.

Direction: NG-RAN \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
AMF UE NGAP ID	M		9.3.3.1		YES	ignore
RAN UE NGAP ID	M		9.3.3.2		YES	ignore
PDU Session Resource		1			YES	ignore
Secondary RAT Usage List						
>PDU Session		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Resource Secondary		ofPDUSes				
RAT Usage Item		sions>				
>>PDU Session ID	M		9.3.1.50		-	
>>Secondary RAT Data Usage Report Transfer	М		OCTET STRING	Containing the Secondary RAT Data Usage Report Transfer IE specified in subclause 9.3.4.23	-	
Handover Flag	0		ENUMERATED (handover_prep aration,)		YES	ignore
User Location Information	0		9.3.1.16		YES	ignore

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.

9.2.15 RIM Information Transfer Messages

9.2.15.1 UPLINK RIM INFORMATION TRANSFER

This message is sent by the NG-RAN node to the AMF to transfer the RIM Information.

Direction: NG-RAN \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
RIM Information Transfer	0		9.3.3.28		YES	ignore

9.2.15.2 DOWNLINK RIM INFORMATION TRANSFER

This message is sent by the AMF to the NG-RAN node to transfer the RIM Information.

Direction: AMF → NG-RAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
RIM Information Transfer	0		9.3.3.28		YES	ignore

9.2.16 Broadcast Session Management Messages

9.2.16.1 BROADCAST SESSION SETUP REQUEST

This message is sent by the AMF to establish a MBS context .

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
S-NSSAI	M		9.3.1.24		YES	reject
MBS Service Area	M		9.3.1.208		YES	reject
MBS Session Setup Request Transfer	М		OCTET STRING	Containing the MBS Session Setup or Modification Request Transfer IE specified in subclause 9.3.5.3	YES	reject

9.2.16.2 BROADCAST SESSION SETUP RESPONSE

This message is sent by the NG-RAN node to report the successful outcome of the request from the BROADCAST SESSION SETUP REQUEST message.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Session Setup Response Transfer	0		OCTET STRING	Containing the MBS Session Setup or Modification Response Transfer IE specified in subclause 9.3.5.5	YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.16.3 BROADCAST SESSION SETUP FAILURE

This message is sent by the NG-RAN node to report the unsuccessful outcome of the request from the BROADCAST SESSION SETUP REQUEST message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Session Setup Failure Transfer	0		OCTET STRING	Containing the MBS Session Setup or Modification Failure Transfer IE specified in subclause 9.3.5.6	YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0	•	9.3.1.3		YES	ignore

9.2.16.4 BROADCAST SESSION MODIFICATION REQUEST

This message is sent by the AMF to modify a MBS context.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Service Area	0		9.3.1.208		YES	reject
MBS Session Modification Request Transfer	0		OCTET STRING	Containing the MBS Session Setup or Modification Request Transfer IE specified in subclause 9.3.5.3	YES	reject

9.2.16.5 BROADCAST SESSION MODIFICATION RESPONSE

This message is sent by the NG-RAN node to report the successful outcome of the request from the BROADCAST SESSION MODIFICATION REQUEST message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	ucscription	YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Session Modification Response Transfer	0		OCTET STRING	Containing the MBS Session Setup or Modification Response Transfer IE specified in subclause 9.3.5.5	YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.16.6 BROADCAST SESSION MODIFICATION FAILURE

This message is sent by the NG-RAN node to report the unsuccessful outcome of the request from the BROADCAST SESSION MODIFICATION REQUEST message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Session Modification Failure Transfer	0		OCTET STRING	Containing the MBS Session Setup or Modification Failure Transfer IE specified in subclause 9.3.5.6	YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.16.7 BROADCAST SESSION RELEASE REQUEST

This message is sent by the AMF to release the corresponding MBS context and the MBS-service-associated logical NG connection.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.16.8 BROADCAST SESSION RELEASE RESPONSE

This message is sent by the NG-RAN node to acknowledge the BROADCAST SESSION RELEASE REQUEST message.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	М		9.3.1.206		YES	reject
MBS Session Release Response Transfer	0		OCTET STRING	Containing the MBS Session Release Response Transfer IE specified in subclause 9.3.5.14	YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

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9.2.16.9 BROADCAST SESSION RELEASE REQUIRED

This message is sent by the NG-RAN node to trigger the AMF to release corresponding MBS context and the MBS-service-associated logical NG connection.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	М		9.3.1.206		YES	reject
Cause	М		9.3.1.2		YES	ignore

9.2.17 Multicast Session Management Messages

9.2.17.1 DISTRIBUTION SETUP REQUEST

This message is sent by the NG-RAN node to request the setup of the NG-U transport for a MBS session, or for one area session of a location dependent multicast session.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
MBS Distribution Setup Request Transfer	М		OCTET STRING	Containing the MBS Distribution Setup Request Transfer IE specified in subclause 9.3.5.7.	YES	reject

9.2.17.2 DISTRIBUTION SETUP RESPONSE

This message is sent by the AMF to confirm the setup of the NG-U transport.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
MBS Distribution Setup Response Transfer	M		OCTET STRING	Containing the MBS Distribution Setup Response Transfer IE specified in	YES	reject
Criticality Diagnostics	0		9.3.1.3	subclause 9.3.5.8.	YES	ignore

9.2.17.3 DISTRIBUTION SETUP FAILURE

This message is sent by the AMF to indicate that the setup of the NG-U transport was unsuccessful.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
MBS Distribution Setup Unsuccessful Transfer	M		OCTET STRING	Containing the MBS Distribution Setup Unsuccessful Transfer IE specified in subclause 9.3.5.9.	YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0	•	9.3.1.3		YES	ignore

9.2.17.4 DISTRIBUTION RELEASE REQUEST

This message is sent by the NG-RAN node to request the release of the NG-U transport.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
MBS Distribution Release Request Transfer	M		OCTET STRING	Containing the MBS Distribution Release Request Transfer IE specified in subclause 9.3.5.10.	YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.17.5 DISTRIBUTION RELEASE RESPONSE

This message is sent by the AMF to confirm the release of the NG-U transport.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.17.6 MULTICAST SESSION ACTIVATION REQUEST

This message is sent by the AMF to a NG-RAN node to request for activating the MBS resources.

Direction: AMF → NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Multicast Session Activation Request Transfer	М		OCTET STRING	Containing the Multicast Session Activation Request Transfer IE specified in subclause 9.3.5.11.	YES	reject

9.2.17.7 MULTICAST SESSION ACTIVATION RESPONSE

This message is sent by the NG-RAN node to the AMF to indicate that the MBS resources have been activated.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.17.8 MULTICAST SESSION ACTIVATION FAILURE

This message is sent by the NG-RAN node to the AMF to indicate multicast session activation failure.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.13		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.17.9 MULTICAST SESSION DEACTIVATION REQUEST

This message is sent by the AMF to a NG-RAN node to request to deactivate the MBS resources of a MBS session.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Multicast Session Deactivation Request Transfer	М		OCTET STRING	Containing the Multicast Session Deactivation Request Transfer IE specified in subclause 9.3.5.12.	YES	reject

9.2.17.10 MULTICAST SESSION DEACTIVATION RESPONSE

This message is sent by the NG-RAN node to the AMF to indicate that the MBS resources have been deactivated.

Direction: NG-RAN node → AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.17.11 MULTICAST SESSION UPDATE REQUEST

This message is sent by the AMF to a NG-RAN node to update the MBS information.

Direction: AMF \rightarrow NG-RAN node

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
			reference	description		Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
Multicast Session Update Request Transfer	М		OCTET STRING	Containing the Multicast Session Update Request Transfer IE specified in subclause 9.3.5.13.	YES	reject

9.2.17.12 MULTICAST SESSION UPDATE RESPONSE

This message is sent by the NG-RAN node to the AMF to confirm the update of MBS information.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	М		9.3.1.1	•	YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
Criticality Diagnostics	0		9.3.1.3		YES	ignore

9.2.17.13 MULTICAST SESSION UPDATE FAILURE

This message is sent by the NG-RAN node to the AMF to indicate multicast session update failure.

Direction: NG-RAN node \rightarrow AMF

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
MBS Session ID	M		9.3.1.206		YES	reject
MBS Area Session ID	0		9.3.1.207		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	0		9.3.1.3		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
Procedure Code	M		INTEGER (0255)	
Type of Message	М		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 NGAP protocol.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Cause Group	M			
>Radio Network Layer				

>>Radio Network Layer	M	ENUMERATED
Cause		(Unspecified,
		TXnRELOCOverall expiry,
		Successful handover,
		Release due to NG-RAN generated
		reason,
		Release due to 5GC generated
		reason,
		Handover cancelled,
		Partial handover,
		Handover failure in target 5GC/NG-
		RAN node or target system,
		Handover target not allowed,
		TNGRELOCoverall expiry,
		TNGRELOCprep expiry,
		Cell not available.
		,
		Unknown target ID,
		No radio resources available in
		target cell,
		Unknown local UE NGAP ID,
		Inconsistent remote UE NGAP ID,
		· ·
		Handover desirable for radio
		reasons,
		Time critical handover,
		Resource optimisation handover,
		Reduce load in serving cell,
		User inactivity,
		Radio connection with UE lost,
		Radio resources not available,
		Invalid QoS combination,
		Failure in the radio interface
		procedure,
		Interaction with other procedure,
		Unknown PDU Session ID,
		Unknown QoS Flow ID,
		Multiple PDU Session ID Instances,
		Multiple QoS Flow ID Instances,
		Encryption and/or integrity
		protection algorithms not supported,
		NG intra-system handover
		triggered,
		NG inter-system handover
		triggered,
		Xn handover triggered,
		Not supported 5QI value,
		UE context transfer.
		IMS voice EPS fallback or RAT
		fallback triggered,
		UP integrity protection not possible,
		UP confidentiality protection not
		possible,
		Slice(s) not supported,
		UE in RRC_INACTIVE state not
		reachable,
		Redirection,
		Resources not available for the
		slice(s),
		UE maximum integrity protected
		data rate reason,
		Release due to CN-detected
		mobility,
		, N26 interface not available,
		Release due to pre-emption,
		Multiple Location Reporting
		Reference ID Instances,
		RSN not available for the UP,
	<u> </u>	NPN access denied,

	-	
		CAG only access denied,
		Insufficient UE Capabilities,
		RedCap UE not supported)
>Transport Layer		
>>Transport Layer Cause	М	ENUMERATED (Transport resource unavailable, Unspecified,)
>NAS		
>>NAS Cause	M	ENUMERATED (Normal release, Authentication failure, Deregister, Unspecified,, UE not in PLMN serving area)
>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,)
>Miscellaneous		
>>Miscellaneous Cause	M	ENUMERATED (Control processing overload, Not enough user plane processing resources, Hardware failure, O&M intervention, Unknown PLMN or SNPN, Unspecified,)

The meaning of the different cause values is described in the following tables. 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.
TXnRELOCOverall expiry	The timer guarding the handover that takes place over Xn has abnormally
Over a set il beredevin	expired.
Successful handover Release due to NG-RAN generated	Successful handover.
reason	Release is initiated due to NG-RAN generated reason.
Release due to 5GC generated	Release is initiated due to 5GC generated reason.
reason	
Handover cancelled	The reason for the action is cancellation of Handover.
Partial handover	Provides a reason for the handover cancellation. The HANDOVER COMMAND message from AMF contained <i>PDU Session Resource to Release List</i> IE or <i>QoS flow to Release List</i> and the source NG-RAN node estimated service continuity for the UE would be better by not proceeding with handover towards this
Handayar failura in target ECC/NC	particular target NG-RAN node. The handover failed due to a failure in target 5GC/NG-RAN node or target
Handover failure in target 5GC/ NG-RAN node or target system	system.
Handover target not allowed	Handover to the indicated target cell is not allowed for the UE in question.
TNGRELOCoverall expiry	The reason for the action is expiry of timer TNGRELOCoverall.
TNGRELOCprep expiry	Handover Preparation procedure is cancelled when timer TNGRELOCprep expires.
Cell not available	The concerned cell is not available.
Unknown target ID	Handover rejected because the target ID is not known to the AMF.
No radio resources available in target cell	Load on target cell is too high.
Unknown local UE NGAP ID	The action failed because the receiving node does not recognise the local UE NGAP ID.
Inconsistent remote UE NGAP ID	The action failed because the receiving node considers that the received remote UE NGAP ID is inconsistent.
Handover desirable for radio reasons	The reason for requesting handover is radio related.
Time critical handover	Handover is requested for time critical reason i.e., this cause value is reserved to represent all critical cases where the connection is likely to be dropped if handover is not performed.
Resource optimisation handover	The reason for requesting handover is to improve the load distribution with the neighbour cells.
Reduce load in serving cell	Load on serving cell needs to be reduced. When applied to handover preparation, it indicates the handover is triggered due to load balancing.
User inactivity	The action is requested due to user inactivity on all PDU sessions, e.g., NG is requested to be released in order to optimise the radio resources. For L2 U2N Relay UE, this action is requested due to user inactivity on all PDU sessions of L2 U2N Relay UE and its served remote UE(s).
Radio connection with UE lost	The action is requested due to losing the radio connection to the UE.
Radio resources not available	No requested radio resources are available.
Invalid QoS combination	The action was failed because of invalid QoS combination.
Failure in the radio interface procedure	Radio interface procedure has failed.
Interaction with other procedure	The action is due to an ongoing interaction with another procedure.
Unknown PDU Session ID	The action failed because the PDU Session ID is unknown in the NG-RAN node.
Unknown QoS Flow ID	The action failed because the QoS Flow ID is unknown in the NG-RAN node.
Multiple PDU Session ID instances	The action failed because multiple instance of the same PDU Session had been provided to/from the NG-RAN node.
Multiple QoS Flow ID instances	The action failed because multiple instances of the same QoS flow had been provided to the NG-RAN node.
Encryption and/or integrity protection algorithms not supported	The NG-RAN node is unable to support any of the encryption and/or integrity protection algorithms supported by the UE.
NG intra-system handover triggered	The action is due to a NG intra-system handover that has been triggered.
NG inter-system handover triggered	The action is due to a NG inter-system handover that has been triggered.
Xn handover triggered	The action is due to an Xn handover that has been triggered.
Not supported 5QI value	The QoS flow setup failed because the requested 5QI is not supported.
UE context transfer	The action is due to a UE resumes from the NG-RAN node different from the one which sent the UE into RRC_INACTIVE state.
IMS voice EPS fallback or RAT fallback triggered	The setup of QoS flow is failed due to EPS fallback or RAT fallback for IMS voice using handover or redirection.
UP integrity protection not possible	The PDU session cannot be accepted according to the required user plane
	integrity protection policy.

UP confidentiality protection not	The PDU session cannot be accepted according to the required user plane
possible	confidentiality protection policy.
Slice(s) not supported	Slice(s) not supported.
UE in RRC_INACTIVE state not	The action is requested due to RAN paging failure.
reachable	
Redirection	The release is requested due to inter-system redirection or intra-system
	redirection.
Resources not available for the	The requested resources are not available for the slice(s).
slice(s)	
UE maximum integrity protected	The request is not accepted in order to comply with the maximum data rate for
data rate reason	integrity protection supported by the UE.
Release due to CN-detected mobility	The context release is requested by the AMF because the UE is already served
	by another CN node (same or different system), or another NG interface of the
	same CN node.
N26 interface not available	The action failed due to a temporary failure of the N26 interface.
Release due to pre-emption	Release is initiated due to pre-emption.
Multiple Location Reporting	The action failed because multiple areas of interest are set with the same
Reference ID Instances	Location Reporting Reference ID.
RSN not available for the UP	The redundant user plane resources indicated by RSN are not available.
NPN access denied	Access was denied, or release is requested, for NPN reasons.
CAG only access denied	Access was denied because the cell is a non-CAG cell and UE is only allowed to
	access CAG cells.
Insufficient UE Capabilities	The procedure can't proceed due to insufficient UE capabilities.
RedCap UE not supported	The action failed because target NG-RAN node does not support RedCap UE.

Transport Layer cause	Meaning
Transport resource unavailable	The required transport resources are not available.
Unspecified	Sent when none of the above cause values applies but still the cause is
	Transport Network Layer related.

NAS cause	Meaning
Normal release	The release is normal.
Authentication failure	The action is due to authentication failure.
Deregister	The action is due to deregister.
Unspecified	Sent when none of the above other cause values applies but still the cause is NAS related.
UE not in PLMN serving area	The release is due to the UE not being within the serving area of its current PLMN (for NTN).

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	Not enough resources are available related to user plane processing.
resources	
Hardware failure	Action related to hardware failure.
O&M intervention	The action is due to O&M intervention.
Unknown PLMN or SNPN	The AMF does not identify any PLMN or SNPN provided by the NG-RAN node.

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 NG-RAN node or the AMF when parts of a received message have not been comprehended or were missing, or if the message contained logical errors. When applicable, it contains information about which IEs were not comprehended or were missing.

For further details on how to use the Criticality Diagnostics IE, see clause 10.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Procedure Code	0		INTEGER (0255)	Used if Criticality Diagnostics is
				part of Error Indication
				procedure, and not within the
				response message of the same
Tring a vine Manage				procedure that caused the error.
Triggering Message	0		ENUMERATED	Used only if the Criticality Diagnostics is part of Error
			(initiating message, successful outcome,	Indication procedure.
			unsuccessful	indication procedure.
			outcome)	
Procedure Criticality	0		ENUMERATED	Used for reporting the Criticality
			(reject, ignore,	of the Triggering message
			notify)	(Procedure).
Information Element		0 <maxnoofer< td=""><td>•</td><td></td></maxnoofer<>	•	
Criticality Diagnostics		rors>		
>IE Criticality	М		ENUMERATED	Used for reporting the criticality
			(reject, ignore,	of the triggering IE. The value
			notify)	'ignore' is not applicable.
>IE ID	M		INTEGER	The IE ID of the not understood
			(065535)	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.
	Value is 256.

9.3.1.4 Bit Rate

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Bit Rate	M		INTEGER (04,000,000,000,000,)	The unit is: bit/s

9.3.1.5 Global RAN Node ID

This IE is used to globally identify an NG-RAN node (see TS 38.300 [8]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE NG-RAN node	M				-	
>gNB						
>>Global gNB ID	M		9.3.1.6		-	
>ng-eNB						
>>Global ng-eNB ID	M		9.3.1.8		-	
>N3IWF						
>>Global N3IWF ID	M		9.3.1.57		-	
>TNGF						
>>Global TNGF ID	M		9.3.1.161		YES	reject
>TWIF						
>>Global TWIF ID	M		9.3.1.163		YES	reject
>W-AGF						
>>Global W-AGF ID	M		9.3.1.162		YES	reject

9.3.1.6 Global gNB ID

This IE is used to globally identify a gNB (see TS $38.300\ [8]$).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE gNB ID	M			
>gNB ID				
>>gNB ID	М		BIT STRING (SIZE(2232))	Equal to the leftmost bits of the NR Cell Identity IE contained in the NR CGI IE of each cell served by the gNB.

9.3.1.7 NR CGI

This IE is used to globally identify an NR cell (see TS 38.300 [8]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
NR Cell Identity	M		BIT STRING (SIZE(36))	The leftmost bits of the <i>NR Cell Identity</i> IE correspond to the gNB ID (defined in subclause 9.3.1.6).

9.3.1.8 Global ng-eNB ID

This IE is used to globally identify an ng-eNB (see TS 38.300 [8]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE ng-eNB ID	M			
>Macro ng-eNB ID				
>>Macro ng-eNB ID	М		BIT STRING (SIZE(20))	Equal to the 20 leftmost bits of the <i>E-UTRA Cell Identity</i> IE contained in the <i>E-UTRA CGI</i> IE of each cell served by the ngeNB.
>Short Macro ng-eNB ID				
>>Short Macro ng-eNB ID	М		BIT STRING (SIZE(18))	Equal to the 18 leftmost bits of the <i>E-UTRA Cell Identity</i> IE contained in the <i>E-UTRA CGI</i> IE of each cell served by the ngeNB.
>Long Macro ng-eNB ID				
>>Long Macro ng-eNB ID	М		BIT STRING (SIZE(21))	Equal to the 21 leftmost bits of the <i>E-UTRA Cell Identity</i> IE contained in the <i>E-UTRA CGI</i> IE of each cell served by the ngeNB.

9.3.1.9 E-UTRA CGI

This IE is used to globally identify an E-UTRA cell (see TS 36.300 [17]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
E-UTRA Cell Identity	M		BIT STRING (SIZE(28))	The leftmost bits of the <i>E-UTRA Cell Identity</i> IE correspond to the ng-eNB ID (defined in subclause 9.3.1.8).

9.3.1.10 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	М		Bit Rate	Maximum Bit Rate	_	Criticality
Downlink	141		9.3.1.4	in DL. Details in TS		
2011111111			0.0.1.1	23.501 [9].		
Maximum Flow Bit Rate	М		Bit Rate	Maximum Bit Rate	-	
Uplink			9.3.1.4	in UL. Details in TS		
				23.501 [9].		
Guaranteed Flow Bit	M		Bit Rate	Guaranteed Bit	-	
Rate Downlink			9.3.1.4	Rate (provided		
				there is data to		
				deliver) in DL.		
				Details in TS		
0 1 1 5 5 7	1.4		D'I D	23.501 [9].		
Guaranteed Flow Bit	М		Bit Rate	Guaranteed Bit	-	
Rate Uplink			9.3.1.4	Rate (provided		
				there is data to deliver) in UL.		
				Details in TS		
				23.501 [9].		
Notification Control	0		ENUMERATED	Details in TS	_	
Trouncation Control			(notification	23.501 [9].		
			requested,)			
Maximum Packet Loss	0		Packet Loss	Indicates the	-	
Rate Downlink			Rate	maximum rate for		
			9.3.1.79	lost packets that		
				can be tolerated in		
				the downlink		
				direction. Details in		
Maximum Packet Loss	0		Packet Loss	TS 23.501 [9].		
	0		Rate	maximum rate for	-	
Rate Uplink			9.3.1.79	lost packets that		
			9.3.1.79	can be tolerated in		
				the uplink		
				direction. Details in		
				TS 23.501 [9].		
Alternative QoS	0		9.3.1.151	Indicates	YES	ignore
Parameters Set List				alternative sets of		
				QoS parameters		
				for the QoS flow.		

9.3.1.11 Void

9.3.1.12 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	М				-	,
>Non-dynamic 5QI						
>>Non Dynamic 5QI Descriptor	М		9.3.1.28		-	
>Dynamic 5QI						
>>Dynamic 5QI Descriptor	М		9.3.1.18		-	
Allocation and Retention Priority	М		9.3.1.19		-	
GBR QoS Flow Information	0		9.3.1.10	This IE shall be present for GBR QoS flows and is ignored otherwise.	-	
Reflective QoS Attribute	0		ENUMERATED (subject to,)	Details in TS 23.501 [9]. This IE may be present in case of Non-GBR QoS flows and is ignored otherwise.	-	
Additional QoS Flow Information	0		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. This IE may be present in case of Non-GBR QoS flows and is ignored otherwise.	-	
QoS Monitoring Request	0		ENUMERATED (UL, DL, Both,, stop)	Indicates to measure UL, or DL, or both UL/DL delays for the associated QoS flow or stop the corresponding QoS monitoring.	YES	ignore
QoS Monitoring Reporting Frequency	0		INTEGER (1 1800,)	Indicates the reporting frequency for RAN part delay for QoS monitoring. Units: second	YES	ignore

9.3.1.13 QoS Flow List with Cause

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
QoS Flow Item		1 <maxnoofq oSFlows></maxnoofq 		
>QoS Flow Identifier	M		9.3.1.51	
>Cause	М		9.3.1.2	

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

9.3.1.14 Trace Activation

This IE defines parameters related to a trace session activation.

IE/Group Name	Presenc	Range	IE type and	Semantics description	Criticality	Assigned
•	е		reference			Criticality
NG-RAN Trace ID	M		OCTET STRING (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [11] (leftmost 6 octets, with PLMN information encoded as in 9.3.3.5), and Trace Recording Session Reference defined in TS 32.422 [11] (last 2 octets).	-	
Interfaces to Trace	M		BIT STRING (SIZE(8))	Each position in the bitmap represents an NG-RAN node interface: first bit = NG-C, second bit = Xn-C, third bit = Uu, fourth bit = F1-C, fifth bit = E1: other bits reserved for future use. Value '1' indicates 'should be traced'. Value '0' indicates 'should not be traced'.	-	
Trace Depth	M		ENUMERATED (minimum, medium, maximum, minimumWithout VendorSpecificE xtension, mediumWithout VendorSpecificE xtension, maximumWithou tVendorSpecific Extension,)	Defined in TS 32.422 [11].	-	
Trace Collection Entity IP Address	M		Transport Layer Address 9.3.2.4	For File based Reporting. Defined in TS 32.422 [11]. This IE is ignored if the Trace Collection Entity URI IE is present.	-	
MDT Configuration	0		9.3.1.167		YES	ignore
Trace Collection Entity URI	0		URI 9.3.2.14	For Streaming based Reporting. Defined in TS 32.422 [11].	YES	ignore

9.3.1.15 Core Network Assistance Information for RRC INACTIVE

This IE provides assistance information for RRC_INACTIVE configuration.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UE Identity Index Value	M		9.3.3.23		-	_
UE Specific DRX	0		Paging DRX 9.3.1.90		-	
Periodic Registration Update Timer	М		9.3.3.24		-	
MICO Mode Indication	0		9.3.1.23		-	
TAI List for RRC Inactive		1			-	
>TAI List for RRC Inactive Item		1 <maxno ofTAlforIn active></maxno 			-	
>>TAI	M		9.3.3.11		-	
Expected UE Behaviour	0		9.3.1.93		-	
E-UTRA Paging eDRX Information	0		9.3.1.154		YES	ignore
Extended UE Identity Index Value	0		9.3.3.52		YES	ignore
UE Radio Capability for Paging	0		9.3.1.68		YES	ignore
MICO All PLMN	0		9.3.1.194		YES	ignore
NR Paging eDRX Information	0		9.3.1.227		YES	ignore
Paging Cause Indication for Voice Service	0		ENUMERATED (supported,)	This IE indicates whether the UE supports the feature of indication of paging cause for voice service.	YES	ignore
PEIPS Assistance Information	0		9.3.1.232		YES	ignore

Range bound	Explanation
maxnoofTAlforInactive	Maximum no. of TAIs for RRC Inactive. Value is 16.

9.3.1.16 User Location Information

This IE is used to provide location information of the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE User Location Information	М				-	
>E-UTRA user location						
information						
>>E-UTRA CGI	М		9.3.1.9		_	
>>TAI	M		9.3.3.11		_	
>>Age of Location	O		Time Stamp 9.3.1.75	Indicates the UTC time when the location information was generated.	-	
>>PSCell Information	0		NG-RAN CGI 9.3.1.73		YES	ignore
>NR user location						
information						
>>NR CGI	М		9.3.1.7		-	
>>TAI	М		9.3.3.11	This IE is ignored if the NR NTN TAI Information IE is present.	-	
>>Age of Location	0		Time Stamp 9.3.1.75	Indicates the UTC time when the location information was generated.	-	
>>PSCell Information	0		NG-RAN CGI 9.3.1.73		YES	ignore
>>NID	0		9.3.3.42		YES	reject
>>NR NTN TAI Information	0		9.3.3.53		YES	ignore
>N3IWF user location information						
>>IP Address	М		Transport Layer Address 9.3.2.4	UE's local IP address used to reach the N3IWF	-	
>>Port Number	0		OCTET STRING (SIZE(2))	UDP or TCP source port number if NAT is detected.	-	
>TNGF user location information					YES	ignore
>>TNAP ID	M		OCTET TNAP Identifier - STRING used to identify the TNAP. Details in TS 29.571 [35].		-	
>>IP Address	М		Transport Layer Address 9.3.2.4	UE's local IP address used to reach the TNGF.	-	
>>Port Number	0		OCTET STRING (SIZE(2))	UDP or TCP source port number if NAT is detected.	-	
>TWIF user location information					YES	ignore
>>TWAP ID	M		OCTET STRING	TWAP Identifier used to identify the TWAP. Details in TS 29.571 [35].	-	
>>IP Address	М		Transport Layer Address 9.3.2.4	Non-5G-Capable over WLAN device's local IP address used to reach the TWIF.	-	

>>Port Number	0	OCTET STRING (SIZE(2))	UDP or TCP source port number if NAT is detected.	-	
>W-AGF user location information			Indicates the location information via wireline access as specified in TS 23.316 [34].	YES	ignore
>>W-AGF user location information	М	9.3.1.164	-	-	

9.3.1.17 Slice Support List

This IE indicates the list of supported slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Slice Support Item		1 <maxnoofsli celtems></maxnoofsli 		
>S-NSSAI	M		9.3.1.24	

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

9.3.1.18 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	М		9.3.1.84	Priority Level is specified in TS 23.501 [9].	-	,
Packet Delay Budget	М		9.3.1.80	Packet Delay Budget is specified in TS 23.501 [9]. This IE is ignored if the Extended Packet Delay Budget IE is present.	-	
Packet Error Rate	M		9.3.1.81	Packet Error Rate is specified in TS 23.501 [9].	-	
5QI	0		INTEGER (0255,)	Indicates the dynamically assigned 5QI as specified in TS 23.501 [9].	-	
Delay Critical	C- ifGBRflow		ENUMERATED (delay critical, non-delay critical,)	Indicates whether the GBR QoS flow is delay critical as specified in TS 23.501 [9].	-	
Averaging Window	C- ifGBRflow		9.3.1.82	Averaging Window is specified in TS 23.501 [9].	-	
Maximum Data Burst Volume	0		9.3.1.83	Maximum Data Burst Volume is specified in TS 23.501 [9]. This IE shall be included if the Delay Critical IE is set to "delay critical" and is ignored otherwise.	-	
Extended Packet Delay Budget	0		9.3.1.135	Packet Delay Budget is specified in TS 23.501 [9].	YES	ignore
CN Packet Delay Budget Downlink	0		Extended Packet Delay Budget 9.3.1.135	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	0		Extended Packet Delay Budget 9.3.1.135	Core Network Packet Delay Budget is specified in TS 23.501 [9]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore

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

9.3.1.19 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	М		INTEGER (115)	Desc.: This IE defines the relative importance of a resource request (see TS 23.501 [9]). Usage: Values are ordered in decreasing order of priority, i.e., with 1 as the highest priority and 15 as the lowest priority.
Pre-emption Capability	M		ENUMERATED (shall not trigger pre-emption, may trigger pre-emption,)	Desc.: This IE indicates the preemption capability of the request on other QoS flows (see TS 23.501 [9]). Usage: The QoS flow shall not pre-empt other QoS flows or, the QoS flow may pre-empt other QoS flows. Note: The Pre-emption Capability indicator applies to the allocation of resources for a QoS flow and as such it provides the trigger to the pre-emption procedures/processes of the NG-RAN node.
Pre-emption Vulnerability	M		ENUMERATED (not pre- emptable, pre-emptable,)	Desc.: This IE indicates the vulnerability of the QoS flow to pre-emption of other QoS flows (see TS 23.501 [9]). Usage: The QoS flow shall not be pre-empted by other QoS flows or the QoS flow may be pre-empted by other QoS flows. Note: The Pre-emption Vulnerability indicator applies for the entire duration of the QoS flow, unless modified and as such indicates whether the QoS flow is a target of the pre-emption procedures/processes of the NG-RAN node.

9.3.1.20 Source to Target Transparent Container

This IE is used to transparently pass radio related information from the handover source to the handover target through the core network; it is produced by the source RAN node and is transmitted to the target RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Source to Target Transparent Container	M		OCTET STRING	This IE includes a transparent container from the source RAN node to the target RAN node. The octets of the OCTET STRING are encoded according to the specifications of the target system. Note: In the current version of the specification, this IE may carry either the Source NG-RAN Node to Target NG-RAN Node Transparent Container IE or the Source eNB to Target eNB Transparent Container IE as defined in TS 36.413 [16] or the Source RNC to Target RNC Transparent Container IE as defined in TS 25.413 [28].

9.3.1.21 Target to Source Transparent Container

This IE is used to transparently pass radio related information from the handover target to the handover source through the core network; it is produced by the target RAN node and is transmitted to the source RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target to Source Transparent Container	М		OCTET STRING	This IE includes a transparent container from the target RAN node to the source RAN node. The octets of the OCTET STRING are encoded according to the specifications of the target system. Note: In the current version of the specification, this IE may carry either the Target NG-RAN Node to Source NG-RAN Node Transparent Container IE or the Target eNB to Source eNB Transparent Container IE as defined in TS 36.413 [16], or the Target RNC to Source RNC Transparent Container IE as defined in TS 25.413 [28].

9.3.1.22 Handover Type

This IE indicates which kind of handover was triggered in the source side.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Handover Type	М		ENUMERATED (Intra5GS, 5GStoEPS, EPSto5GS,, 5GStoUTRA)	Intra5GS: NG-RAN node to NG- RAN node 5GStoEPS: NG-RAN node to eNB EPSto5GS: eNB to NG-RAN node 5GStoUTRA: NG-RAN node to UTRA

9.3.1.23 MICO Mode Indication

This IE indicates that the UE is configured with MICO mode by the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MICO Mode Indication	М		ENUMERATED (true,)	

9.3.1.24 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	0		OCTET STRING (SIZE(3))	

9.3.1.25 Target ID

This IE identifies the target for the handover.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Target ID	M			
>NG-RAN				
>>Global RAN Node ID	М		9.3.1.5	
>>Selected TAI	M		TAI 9.3.3.11	
>E-UTRAN				
>>Global eNB ID	M		Global ng-eNB ID 9.3.1.8	
>>Selected EPS TAI	M		EPS TAI 9.3.3.17	
>Target RNC-ID				
>>LAI	M		9.3.3.30	
>>RNC-ID	M		9.3.1.123	This IE is ignored if the Extended RNC-ID IE is included in the Target ID IE.
>>Extended RNC-ID	0		9.3.1.124	The Extended RNC-ID IE is used if the RNC identity has a value larger than 4095.

9.3.1.26 Emergency Fallback Indicator

The IE indicates emergency service fallback.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Emergency Fallback Request Indicator	М		ENUMERATED (emergency fallback requested,)	
Emergency Service Target CN	0		ENUMERATED (5GC, EPC,)	

9.3.1.27 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 sessions, respectively. Additionally, this IE contains the maximum integrity protected data rate per UE for integrity protection for DRBs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Integrity Protection Indication	М		ENUMERATED (required, preferred, not needed,)	Indicates whether UP integrity protection shall apply, should apply or shall not apply for the concerned PDU session.	-	
Confidentiality Protection Indication	М		ENUMERATED (required, preferred, not needed,)	Indicates whether UP ciphering shall apply, should apply or shall not apply for the concerned PDU session.	-	
Maximum Integrity Protected Data Rate Uplink	C- ifIntegrity Protectio nRequire dorPrefer red		Maximum Integrity Protected Data Rate 9.3.1.103	Indicates the maximum aggregate rate for integrity protected DRBs supported by the UE in UL. If the Maximum Integrity Protected Data Rate Downlink IE is absent, this IE applies to both UL and DL.	-	
Maximum Integrity Protected Data Rate Downlink	0		Maximum Integrity Protected Data Rate 9.3.1.103	Indicates the maximum aggregate rate for integrity protected DRBs supported by the UE in the DL.	YES	ignore

Condition	Explanation
ifIntegrityProtectionRequiredorPreferr	This IE shall be present if the Integrity Protection Indication IE within the
ed	Security Indication IE is set to "required" or "preferred".

9.3.1.28 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 (0255,)	Indicates the standardized or pre-configured 5QI as specified in TS 23.501 [9].	-	,
Priority Level	0		9.3.1.84	Priority Level is specified in TS 23.501 [9]. When included, it overrides standardized or pre-configured value.	-	
Averaging Window	0		9.3.1.82	Averaging Window is specified in TS 23.501 [9]. When included, it overrides standardized or pre-configured value.	-	
Maximum Data Burst Volume	0		9.3.1.83	Maximum Data Burst Volume is specified in TS 23.501 [9]. When included, it overrides standardized or pre-configured value.	-	
CN Packet Delay Budget Downlink	0		Extended Packet Delay Budget 9.3.1.135	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	0		Extended Packet Delay Budget 9.3.1.135	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

9.3.1.29 Source NG-RAN Node to Target NG-RAN Node Transparent Container

This IE is produced by the source NG-RAN node and is transmitted to the target NG-RAN node. For inter-system handovers to 5G, the IE is transmitted from the external handover source to the target NG-RAN node.

This IE is transparent to the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RRC Container	M		OCTET STRING	Includes the RRC	_	Criticality
	'*'		COTETOTIMO	HandoverPreparati		
				onInformation		
				message as		
				defined in TS		
				38.331 [18] if the		
				target is a gNB.		
				Includes the RRC		
				HandoverPreparati		
				onInformation		
				message as		
				defined in TS		
				36.331 [21] if the		
				target is an ng-		
PDU Session Resource		01		eNB. For intra-system		
Information List		01		handovers in NG-	-	
Information List				RAN.		
>PDU Session		1 <maxno< td=""><td></td><td></td><td>_</td><td></td></maxno<>			_	
Resource Information	1	ofPDUSes				
Item		sions>				
>>PDU Session ID	М		9.3.1.50		-	
>>QoS Flow		1			-	
Information List						
>>>QoS Flow		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Information Item		ofQoSFlo				
		WS>				
>>>>QoS Flow	М		9.3.1.51		-	
Identifier			0.04.00			
>>>>DL Forwarding	0		9.3.1.33		- VEC	:
>>>>UL Forwarding >>>>Source	0		9.3.1.118	Identifies the TNL	YES YES	ignore
			Transport Layer Address	address used by	TES	ignore
Transport Layer Address			9.3.2.4	the sending node		
Address			3.3.2.4	for direct data		
				forwarding		
				towards the target		
				NG-RAN node		
>>>>Source Node	0		Transport Layer	Identifies the TNL	YES	ignore
Transport Layer			Address	address used by]
Address			9.3.2.4	the source SN		
				node for direct		
				data forwarding		
				towards the target		
				NG-RAN node		
>>DRBs to QoS Flows	0		9.3.1.34		-	
Mapping List		0.4		Familia :		
E-RAB Information List		01		For inter-system handovers to 5G.	-	
>E-RAB Information		1 <maxno< td=""><td></td><td>nandovers to 5G.</td><td>-</td><td></td></maxno<>		nandovers to 5G.	-	
Item	1	ofE-			_	
		RABs>				
>>E-RAB ID	М		9.3.2.3		-	
>>DL Forwarding	0		9.3.1.33		-	
>>Source Transport	0		Transport Layer	Identifies the TNL	YES	ignore
Layer Address			Address	address used by		
			9.3.2.4	the sending node		
				for direct data		
	1			forwarding		
	1			towards the target		
				NG-RAN node		

	1	1	T			_
>>Source Node Transport Layer Address	0		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source SN node for direct data forwarding towards the target NG-RAN node	YES	ignore
Target Cell ID	М		NG-RAN CGI 9.3.1.73		-	
Index to RAT/Frequency Selection Priority	0		9.3.1.61		-	
UE History Information	M		9.3.1.95		-	
SgNB UE X2AP ID	О		9.3.1.127	Allocated at the Source en-gNB	-	
UE History Information from UE	0		9.3.1.166		YES	ignore
Source Node ID	0		9.3.1.195	Source SN ID	YES	ignore
UE Context Reference at Source	0		RAN UE NGAP ID 9.3.3.2		YES	ignore
MBS Active Session Information Source to Target List		01			YES	ignore
>MBS Active Session Information Source to Target Item		1 <maxno ofMBSSes sionsofUE ></maxno 			-	
>>MBS Session ID	M		9.3.1.206		-	
>>MBS Area Session ID	0		9.3.1.207	If included, this IE indicates the MBS Area Session ID of the UE at the NG-RAN node from which the UE context is transferred	-	
>>MBS Service Area	0		9.3.1.208	Included if available in source NG-RAN node.	-	
>>MBS QoS Flows To Be Setup List	М		9.3.1.236		-	
>>MBS Mapping and Data Forwarding Request List		01			-	
>>>MBS Mapping and Data Forwarding Request Item		1 <maxno ofMRBs></maxno 			-	
>>>>MRB ID	М		9.3.1.218		-	
>>>>MBS QoS Flow List		1 <maxno ofMBSQo Sflows></maxno 			-	
>>>>MBS QoS Flow Identifier	М		QoS Flow Identifier 9.3.1.51		-	
>>>>MRB Progress Information	0		9.3.1.219	The SN information of the last packet which has already been delivered for the MRB.	-	

QMC Configuration Information	0		9.3.1.223	Used for passing the QoE measurement information from the source NG- RAN node to the target NG-RAN node.	YES	ignore
NGAP IE Support Information Request List		01			YES	ignore
>NGAP IE Support Information Request Item		1 <maxno ofIESuppo rtInfo></maxno 			-	
>>NGAP Protocol IE-Id	М		9.3.1.239		-	

Range bound	Explanation
maxnoofPDUSessions	Maximum no. of PDU sessions allowed towards one UE. Value is 256.
maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU session. Value is 64.
maxnoofE-RABs	Maximum no. of E-RABs allowed towards one UE. Value is 256.
maxnoofMBSSessions	Maximum no. of MBS sessions allowed within one PDU session. Value is 32.
maxnoofMBSSessionsofUE	Maximum no. of MBS sessions allowed towards one UE. Value is 256.
maxnoofMBSQoSflows	Maximum no. of MBS QoS flows allowed within one MBS session. Value is 64.
maxnoofMRBs	Maximum no. of MRBs. Value is 32.
maxnoofIESupportInfo	Maximum no. of IE Support Information. Value is 32.

9.3.1.30 Target NG-RAN Node to Source NG-RAN Node Transparent Container

This IE is produced by the target NG-RAN node and is transmitted to the source NG-RAN node. For inter-system handovers to 5G, the IE is transmitted from the target NG-RAN node to the external relocation source.

This IE is transparent to the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RRC Container	M		OCTET STRING	Includes the RRC HandoverComman d message as defined in TS 38.331 [18] if the target is a gNB. Includes the RRC HandoverComman d message as defined in TS 36.331 [21] if the	-	
				target is an ng- eNB.		
DAPS Response Information List		01			YES	ignore
>DAPS Response Information Item		1 <maxno ofDRBs></maxno 			-	
>>DRB ID	М		9.3.1.53		-	
>>DAPS Response Information	M		9.3.1.189	Indicates the response to a requested DAPS Handover	-	
Direct Forwarding Path Availability	0		9.3.1.64	Indicates whether a direct forwarding path between the source SN and the target NG-RAN node is available for inter-system handover	YES	ignore
MBS Active Session Information Target to Source List		01			YES	ignore
>MBS Active Session Information Target to Source Item		1 <maxno ofMBSSes sionsofUE ></maxno 			-	
>>MBS Session ID	М		9.3.1.206		_	
>>Data Forwarding Response MRB List		01	0.01.1.200		-	
>>>Data Forwarding Response MRB Item		1 <maxno ofMRBs></maxno 			-	
>>>>MRB ID	М		9.3.1.218		-	
>>>>DL Forwarding UP TNL Information	M		UP Transport Layer Information 9.3.2.2		-	
>>>>MRB Progress Information	0		9.3.1.219	This IE includes the information of the oldest packet available at the target NG-RAN node for the MRB.	-	
NGAP IE Support Information Response List	0		9.3.1.242		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs allowed towards one UE. Value is 32.
maxnoofMBSSessionsofUE	Maximum no. of MBS sessions allowed towards one UE. Value is 256.
maxnoofMRBs	Maximum no. of MRBs, Value is 32.

9.3.1.31 Allowed NSSAI

This IE contains the allowed NSSAI.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Allowed S-NSSAI List		1		
>Allowed S-NSSAI Item		1 <maxnoofall owedS- NSSAls></maxnoofall 		
>>S-NSSAI	М		9.3.1.24	

Range bound	Explanation		
maxnoofAllowedS-NSSAIs	Maximum no. of allowed S-NSSAI. Value is 8.		

9.3.1.32 Relative AMF Capacity

This IE indicates the relative processing capacity of an AMF with respect to the other AMFs in the AMF Set in order to load-balance AMFs within an AMF Set defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Relative AMF Capacity	M		INTEGER (0255)	

9.3.1.33 DL Forwarding

This IE indicates that the QoS flow or E-RAB is proposed for forwarding of downlink packets.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL Forwarding	М		ENUMERATED (DL	
			forwarding proposed,)	

9.3.1.34 DRBs to QoS Flows 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
DRBs to QoS Flows Mapping Item		1 <maxno ofDRBs></maxno 			-	
>DRB ID	М		9.3.1.53		-	
>Associated QoS Flow List	M		9.3.1.99	Contains information of the QoS flows mapped to the DRB	-	
>DAPS Request Information	0		9.3.1.188		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs allowed towards one UE. Value is 32.

9.3.1.35 Message Identifier

This IE identifies the warning message. It is set by the AMF and transferred to the UE by the NG-RAN node.

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

9.3.1.36 Serial Number

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

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

9.3.1.37 Warning Area List

This IE indicates the areas where the warning message needs to be broadcast or cancelled.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Warning Area	М			
>E-UTRA Cell IDs				
>>EUTRA CGI List for Warning		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>E-UTRA CGI	М		9.3.1.9	
>NR Cell IDs				
>>NR CGI List for Warning		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>NR CGI	М		9.3.1.7	
>TAIs for Warning				
>>TAI List for Warning		1 <maxnooft AlforWarning></maxnooft 		
>>>TAI	М		9.3.3.11	
>Emergency Area IDs				
>>Emergency Area ID List		1 <maxnoofe mergencyAreal D></maxnoofe 		
>>>Emergency Area ID	М		9.3.1.48	

Range bound	Explanation
maxnoofCellIDforWarning	Maximum no. of Cell ID subject for warning message broadcast. Value is
_	65535.
maxnoofTAlforWarning	Maximum no. of TAI subject for warning message broadcast. Value is
-	65535.
maxnoofEmergencyAreaID	Maximum no. of Emergency Area ID subject for warning message
	broadcast. Value is 65535.

9.3.1.38 Number of Broadcasts Requested

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Number of Broadcasts	M		INTEGER	
Requested			(065535)	

9.3.1.39 Warning Type

This IE indicates types of the disaster. This IE also indicates that a Primary Notification is included. This IE can be used by the UE to differentiate the type of alert according to the type of disaster.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Warning Type	М		OCTET STRING (SIZE(2))	

9.3.1.40 Void

9.3.1.41 Data Coding Scheme

This IE identifies the alphabet or coding employed for the message characters and message handling at the UE (it is passed transparently from the 5GC to the UE).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Data Coding Scheme	М		BIT STRING (SIZE(8))	

9.3.1.42 Warning Message Contents

This IE contains user information, e.g., the message with warning contents, and will be broadcast over the radio interface.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Warning Message Contents	М		OCTET STRING (SIZE(19600))	

9.3.1.43 Broadcast Completed Area List

This IE indicates the areas where either resources are available to perform the broadcast or where broadcast is performed successfully.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Broadcast	М		10.0.0.0	
Completed Area				
>Cell ID Broadcast E- UTRA				
>>Completed Cell List		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>E-UTRA CGI	М		9.3.1.9	
>TAI Broadcast E-UTRA				
>>TAI Broadcast		1 <maxnooft AlforWarning></maxnooft 		
>>>TAI	М		9.3.3.11	
>>>Completed Cell in TAI List		1 <maxnoofc ellinTAI></maxnoofc 		
>>>>E-UTRA CGI	М		9.3.1.9	
>Emergency Area ID Broadcast E-UTRA				
>>Emergency Area ID		1 <maxnoofe< td=""><td></td><td></td></maxnoofe<>		
Broadcast		mergencyAreal D>		
>>>Emergency Area ID	М		9.3.1.48	
>>>Completed Cell in		1 <maxnoofc< td=""><td></td><td></td></maxnoofc<>		
Emergency Area ID List		ellinEAI>		
>>>>E-UTRA CGI	М		9.3.1.9	
>Cell ID Broadcast NR				
>>Completed Cell List		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>NR-CGI	М		9.3.1.7	
>TAI Broadcast NR				
>>TAI Broadcast		1 <maxnooft AlforWarning></maxnooft 		
>>>TAI	М		9.3.3.11	
>>>Completed Cell in TAI List		1 <maxnoofc ellinTAI></maxnoofc 		
>>>>NR-CGI	М		9.3.1.7	
>Emergency Area ID Broadcast NR				
>>Emergency Area ID Broadcast		1 <maxnoofe mergencyAreal D></maxnoofe 		
>>>Emergency Area ID	М		9.3.1.48	
>>>Completed Cell in Emergency Area ID List		1 <maxnoofc ellinEAI></maxnoofc 		
>>>NR-CGI	M		9.3.1.7	
>>>>IN□-∪GI	IVI		a.J.1./	

Range bound	Explanation
maxnoofCellIDforWarning	Maximum no. of Cell ID subject for warning message broadcast. Value is 65535.
maxnoofTAlforWarning	Maximum no. of TAI subject for warning message broadcast. Value is 65535.
maxnoofEmergencyAreaID	Maximum no. of Emergency Area ID subject for warning message broadcast. Value is 65535.
maxnoofCellinTAI	Maximum no. of Cell ID within a TAI. Value is 65535.
maxnoofCellinEAI	Maximum no. of Cell ID within an Emergency Area. Value is 65535.

9.3.1.44 Broadcast Cancelled Area List

This IE indicates the areas where broadcast was stopped successfully.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Broadcast Cancelled Area	М			
>Cell ID Cancelled E- UTRA				
>>Cancelled Cell List		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>E-UTRA CGI	М	92	9.3.1.9	
>>>Number of Broadcasts	М		9.3.1.45	
>TAI Cancelled E-UTRA				
>>TAI Cancelled		1 <maxnooft AlforWarning></maxnooft 		
>>>TAI	М		9.3.3.11	
>>>Cancelled Cell in TAI List		1 <maxnoofc ellinTAI></maxnoofc 		
>>>>E-UTRA CGI	М		9.3.1.9	
>>>>Number of Broadcasts	М		9.3.1.45	
>Emergency Area ID Cancelled E-UTRA				
>>Emergency Area ID Cancelled		1 <maxnoofe mergencyAreal D></maxnoofe 		
>>>Emergency Area ID	М		9.3.1.48	
>>>Cancelled Cell in Emergency Area ID List		1 <maxnoofc ellinEAI></maxnoofc 		
>>>>E-UTRA CGI	М		9.3.1.9	
>>>Number of Broadcasts	М		9.3.1.45	
>Cell ID Cancelled NR				
>>Cancelled Cell List		1 <maxnoofc ellIDforWarnin g></maxnoofc 		
>>>NR-CGI	М		9.3.1.7	
>>>Number of Broadcasts	М		9.3.1.45	
>TAI Cancelled NR				
>>TAI Cancelled		1 <maxnooft AlforWarning></maxnooft 		
>>>TAI	M		9.3.3.11	
>>>Cancelled Cell in TAI List		1 <maxnoofc ellinTAI></maxnoofc 		
>>>>NR-CGI	M		9.3.1.7	
>>>Number of Broadcasts	М		9.3.1.45	
>Emergency Area ID Cancelled NR				
>>Emergency Area ID Cancelled		1 <maxnoofe mergencyAreal D></maxnoofe 		
>>>Emergency Area ID	M		9.3.1.48	
>>>Cancelled Cell in Emergency Area ID List		1 <maxnoofc ellinEAI></maxnoofc 		
>>>NR-CGI	M		9.3.1.7	
>>>Number of	M		9.3.1.45	
Broadcasts				

Range bound	Explanation
maxnoofCellIDforWarning	Maximum no. of Cell ID subject for warning message broadcast. Value is 65535.
maxnoofTAlforWarning	Maximum no. of TAI subject for warning message broadcast. Value is 65535.
maxnoofEmergencyAreaID	Maximum no. of Emergency Area ID subject for warning message broadcast. Value is 65535.
maxnoofCellinTAI	Maximum no. of Cell ID within a TAI. Value is 65535.
maxnoofCellinEAI	Maximum no. of Cell ID within an Emergency Area. Value is 65535.

9.3.1.45 Number of Broadcasts

This IE indicates the number of times that a particular message has been broadcast in a given warning area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Number of Broadcasts	M		INTEGER (065535)	This IE is set to '0' if valid results are not known or not available. It is set to 65535 if the counter results have overflowed.

9.3.1.46 Concurrent Warning Message Indicator

This IE indicates to the NG-RAN node that the received warning message is a new message to be scheduled for concurrent broadcast with any other ongoing broadcast of warning messages.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Concurrent Warning Message Indicator	М		ENUMERATED (true,)	This IE is used to identify a PWS type warning system which allows the broadcast of multiple concurrent warning messages over the radio.

9.3.1.47 Cancel-All Warning Messages Indicator

This IE indicates to the NG-RAN node to stop all already ongoing broadcast of warning messages in the NG-RAN node or in an area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cancel-All Warning	M		ENUMERATED	
Messages Indicator			(true,)	

9.3.1.48 Emergency Area ID

This IE is used to indicate the area which has the emergency impact.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Emergency Area ID	M		OCTET STRING (SIZE(3))	Emergency Area ID may consist of several cells. Emergency Area ID is defined by the operator.

9.3.1.49 Repetition Period

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Repetition Period	M		INTEGER (02 ¹⁷ -1)	The unit of value 1 to 2 ¹⁷ -1 is [second].

9.3.1.50 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 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session ID	M		INTEGER (0255)	

9.3.1.51 QoS Flow Identifier

This IE identifies a QoS flow within a PDU Session, or a MBS QoS flow within a MBS session. The definition and use of the QoS Flow Identifier is specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Identifier	M		INTEGER (063,)	

9.3.1.52 PDU Session Type

This IE indicates the PDU Session Type as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Type	М		ENUMERATED (Ipv4, Ipv6, Ipv4v6, ethernet,	
			unstructured,)	

9.3.1.53 DRB ID

This IE contains the DRB ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB ID	М		INTEGER (132)	

9.3.1.54 Masked IMEISV

This IE contains the IMEISV value with a mask, to identify a terminal model without identifying an individual Mobile Equipment.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Masked IMEISV	M		BIT STRING (SIZE(64))	Coded as the International Mobile station Equipment Identity and Software Version Number (IMEISV) defined in TS 23.003 [23] with the last 4 digits of the SNR masked by setting the corresponding bits to 1. The first to fourth bits correspond to the first digit of the IMEISV, the fifth to eighth bits correspond to the second digit of the IMEISV, and so on.

9.3.1.55 New Security Context Indicator

This IE indicates that the AMF has activated a new 5G NAS security context as described in TS 33.501 [13].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
New Security Context Indicator	М		ENUMERATED (true,)	The NSCI as defined in TS 33.501 [13].

9.3.1.56 Time to Wait

This IE defines the minimum allowed waiting time.

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

9.3.1.57 Global N3IWF ID

This IE is used to globally identify an N3IWF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE N3IWF ID	M			
>N3IWF ID				
>>N3IWF ID	M		BIT STRING (SIZE(16))	

9.3.1.58 UE Aggregate Maximum Bit Rate

This IE is applicable for all Non-GBR QoS flows per UE which is defined for the downlink and the uplink direction and a subscription parameter provided by the AMF to the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Aggregate Maximum Bit Rate		1		Applicable for Non-GBR QoS flows.
>UE Aggregate Maximum Bit Rate Downlink	M		Bit Rate 9.3.1.4	This IE indicates the UE Aggregate Maximum Bit Rate as specified in TS 23.501 [9] in the downlink direction.
>UE Aggregate Maximum Bit Rate Uplink	M		Bit Rate 9.3.1.4	This IE indicates the UE Aggregate Maximum Bit Rate as specified in TS 23.501 [9] in the uplink direction.

9.3.1.59 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.
Confidentiality Protection Result	M		ENUMERATED (performed, not performed,)	Indicates whether UP ciphering is performed or not for the concerned PDU session.

9.3.1.60 User Plane Security Information

This IE indicates user plane security information related to security policy.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Security Result	M		9.3.1.59	
Security Indication	М		9.3.1.27	

9.3.1.61 Index to RAT/Frequency Selection Priority

This IE is used to define local configuration for RRM strategies such as camp priorities in Idle mode and control of inter-RAT/inter-frequency handover in Active mode (see TS 23.501 [9]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Index to RAT/Frequency	M		INTEGER (1256,	
Selection Priority)	

9.3.1.62 Data Forwarding Accepted

This IE indicates that the NG-RAN node accepts the proposed DL data forwarding for the QoS flow which is subject to data forwarding.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Data Forwarding Accepted	M		ENUMERATED	
			(data forwarding	
			accepted,)	

9.3.1.63 Data Forwarding Not Possible

This IE indicates that the 5GC decided that the corresponding PDU session will not be subject to data forwarding.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Data Forwarding Not	M		ENUMERATED	
Possible			(data forwarding not	
			possible,)	

9.3.1.64 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	M		ENUMERATED	
Availability			(direct path	
			available,)	

9.3.1.65 Location Reporting Request Type

This IE indicates the type of location request to be handled by the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Event Type	M		ENUMERATED (direct, change of serving cell, UE presence in the area of interest, stop change of serving cell, stop UE presence in the area of interest, cancel location reporting for the UE,)	·	-	
Report Area	М		ENUMERATED (cell,)		-	
Area of Interest List		01	,		-	
>Area of Interest Item		1 <maxno ofAol></maxno 			-	
>>Area of Interest	M		9.3.1.66		-	
>>Location Reporting Reference ID	М		9.3.1.76		-	
Location Reporting Reference ID to be Cancelled	C- ifEventTy peisStop UEPresin Aol		Location Reporting Reference ID 9.3.1.76		-	
Additional Location Information	0		ENUMERATED (Include PSCell,)		YES	ignore

Range bound	Explanation
maxnoofAoI	Maximum no. of areas of interest. Value is 64.

Condition	Explanation
ifEventTypeisStopUEPresinAoI	This IE shall be present if the Event Type IE is set to "stop UE presence in the
	area of interest".

9.3.1.66 Area of Interest

This IE indicates the area of interest.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Area of Interest TAI List		01		
>Area of Interest TAI		1 <maxnooft< th=""><th></th><th></th></maxnooft<>		
Item		AlinAol>		
>>TAI	M		9.3.3.11	
Area of Interest Cell List		01		
>Area of Interest Cell Item		1 <maxnoofc ellinAol></maxnoofc 		
>>NG-RAN CGI	М		9.3.1.73	
Area of Interest RAN Node List		01		
>Area of Interest RAN Node Item		1 <maxnoofr ANNodeinAol></maxnoofr 		
>>Global RAN Node ID	М		9.3.1.5	

Range bound	Explanation
maxnoofTAlinAol	Maximum no. of tracking areas in an area of interest. Value is 16.
maxnoofCellinAoI	Maximum no. of cells in an area of interest. Value is 256.
maxnoofRANNodeinAol	Maximum no. of NG-RAN nodes in an area of interest. Value is 64.

9.3.1.67 UE Presence in Area of Interest List

This IE indicates the UE presence in the area of interest.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Presence in Area of Interest Item		1 <maxnoofao ></maxnoofao 		
>Location Reporting Reference ID	M		9.3.1.76	
>UE Presence	М		ENUMERATED (in, out, unknown,)	

Range bound	Explanation		
maxnoofAol	Maximum no. of areas of interest. Value is 64.		

9.3.1.68 UE Radio Capability for Paging

This IE contains paging specific UE Radio Capability information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Radio Capability for Paging of NR	0		OCTET STRING	Includes the RRC UERadioPagingInformation message as defined in TS 38.331 [18].
UE Radio Capability for Paging of E-UTRA	0		OCTET STRING	Includes the RRC UERadioPagingInformation message as defined in TS 36.331 [21].
UE Radio Capability for Paging of NB-IoT	0		OCTET STRING	Includes the RRC UERadioPagingInformation-NB message as defined in TS 36.331 [21].

9.3.1.69 Assistance Data for Paging

This IE provides assistance information for paging optimisation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Assistance Data for Recommended Cells	0		9.3.1.70		-	
Paging Attempt Information	0		9.3.1.72		-	
NPN Paging Assistance Information	0		9.3.1.183		YES	ignore
Paging Assistance Data for CE Capable UE	0		9.3.1.141		YES	ignore

9.3.1.70 Assistance Data for Recommended Cells

This IE provides assistance information for paging in recommended cells.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Recommended Cells for Paging	M		9.3.1.71	

9.3.1.71 Recommended Cells for Paging

This IE contains the recommended cells for paging.

This IE is transparent to the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Recommended Cell List		1		
>Recommended Cell Item		1 <maxnoofr ecommendedC ells></maxnoofr 		Includes visited and non-visited cells, where visited cells are listed in the order the UE visited them with the most recent cell being the first in the list. Non-visited cells are included immediately after the visited cell they are associated with.
>>NG-RAN CGI	М		9.3.1.73	-
>>Time Stayed in Cell	0		INTEGER (04095)	This is included for visited cells and indicates the time a UE stayed in a cell in seconds. If the UE stays in a cell more than 4095 seconds, this IE is set to 4095.

Range bound	Explanation	
maxnoofRecommendedCells	Maximum no. of recommended Cells. Value is 16.	

9.3.1.72 Paging Attempt Information

This IE includes information related to the paging count over NG.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Paging Attempt Count	М		INTEGER (116,)	Paging attempt count (see TS 38.300 [8]).
Intended Number of Paging Attempts	М		INTEGER (116,)	Intended number of paging attempts (see TS 38.300 [8]).
Next Paging Area Scope	0		ENUMERATED (same, changed,)	Indicates whether the paging area scope will change or not at next paging attempt. Usage specified in TS 38.300 [8].

9.3.1.73 NG-RAN CGI

This IE is used to globally identify a cell in NG-RAN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE NG-RAN CGI	M			
>NR				
>>NR CGI	M		9.3.1.7	
>E-UTRA				
>>E-UTRA CGI	M		9.3.1.9	

9.3.1.74 UE Radio Capability

This IE contains UE Radio Capability information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Radio Capability	М		OCTET STRING	Includes either the RRC UERadioAccessCapabilityInform ation message as defined in TS 38.331 [18], or the UERadioAccessCapabilityInform ation-NB message as defined in TS 36.331 [21].

9.3.1.74a UE Radio Capability – E-UTRA Format

This IE contains UE Radio Capability information encoded as specified in TS 36.331 [21] in order to support Mode of operation A as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Radio Capability – E- UTRA Format	M		OCTET STRING	Includes the RRC UERadioAccessCapabilityInform ation message as defined in TS 36.331 [21].

9.3.1.75 Time Stamp

This IE contains UTC time information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Time Stamp	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 [25].

9.3.1.76 Location Reporting Reference ID

This IE contains the Location Reporting Reference ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Location Reporting Reference ID	М		INTEGER (164,)	

9.3.1.77 Data Forwarding Response DRB List

This IE indicates data forwarding related information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Data Forwarding Response DRB Item		1 <maxnoofd RBs></maxnoofd 		
>DRB ID	М		9.3.1.53	
>DL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	
>UL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	

Range bound Explanation	
maxnoofDRBs	Maximum no. of DRBs allowed towards one UE. Value is 32.

9.3.1.78 Paging Priority

This element indicates the paging priority for paging a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging Priority	М		ENUMERATED (PrioLevel1, PrioLevel2, PrioLevel3, PrioLevel4, PrioLevel6, PrioLevel6, PrioLevel7, PrioLevel8,)	Lower value codepoint indicates higher priority.

9.3.1.79 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 (01000,)	Ratio of lost packets per number of packets sent, expressed in tenth of percent.

9.3.1.80 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 (01023,	Upper bound value for the delay
)	that a packet may experience
				expressed in unit of 0.5ms.

9.3.1.81 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 (09,)	The packet error rate is expressed as <i>Scalar</i> x 10-k where k is the <i>Exponent</i> .
Exponent	M		INTEGER (09,)	

9.3.1.82 Averaging Window

This IE indicates the Averaging Window for a QoS flow, and applies to GBR QoS flows only.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Averaging Window	M		INTEGER (04095,	Unit: ms.
)	The default value of the IE is
				2000ms.

9.3.1.83 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	M		INTEGER (04095,	Unit: byte.
Volume			, 4096 2000000)	

9.3.1.84 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 (1127,)	Values ordered in decreasing order of priority, i.e. with 1 as the highest priority and 127 as the lowest priority.

9.3.1.85 Mobility Restriction List

This IE defines roaming or access restrictions for subsequent mobility action for which the NG-RAN provides information about the target of the mobility action towards the UE, e.g., handover, or for SCG selection during dual connectivity operation or for assigning proper RNAs. NG-RAN behaviour upon receiving this IE is specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Serving PLMN	М		PLMN Identity 9.3.3.5		-	•
Equivalent PLMNs		0 <maxno ofEPLMNs ></maxno 	0.0.0.0	Allowed PLMNs in addition to Serving PLMN. This list corresponds to the list of "equivalent PLMNs" as defined in TS 24.501 [26]. This list is part of the roaming restriction information. Roaming restrictions apply to PLMNs other than the Serving PLMN and Equivalent PLMNs.	-	
>PLMN Identity	М		9.3.3.5	Equivalent i Elvirto.	-	
RAT Restrictions		0 <maxno ofEPLMNs PlusOne></maxno 		This IE contains RAT restriction related information as specified in TS 23.501 [9].	-	
>PLMN Identity	M		9.3.3.5		-	
>RAT Restriction Information	M		BIT STRING { e-UTRA (0), nR (1), nR- unlicensed (2), nR-LEO (3), nR-MEO (4), nR-GEO (5), nR-OTHERSAT (6)} (SIZE(8,))	Each position in the bitmap represents a RAT. If a bit is set to "1", the respective RAT is restricted for the UE. If a bit is set to "0", the respective RAT is not restricted for the UE. Bit 7 reserved for future use.		
>Extended RAT Restriction Information	0		9.3.1.126	If this IE is included, the RAT Restriction Information IE is ignored.	YES	ignore
Forbidden Area Information		0 <maxno ofEPLMNs PlusOne></maxno 		This IE contains Forbidden Area information as specified in TS 23.501 [9].	-	
>PLMN Identity	М		9.3.3.5	- 1	-	
>Forbidden TACs		1 <maxno ofForbTA Cs></maxno 			-	
>>TAC	M		9.3.3.10	The TAC of the forbidden TAI.	-	
Service Area Information		0 <maxno ofEPLMNs PlusOne></maxno 		This IE contains Service Area Restriction information as specified in TS 23.501 [9].	-	
>PLMN Identity	М		9.3.3.5		-	
>Allowed TACs		0 <maxno ofAllowed Areas></maxno 			-	

>>TAC	М		9.3.3.10	The TAC of the	_	
>>1AC	IVI		9.3.3.10	allowed TAI.	•	
>Not Allowed TACs		0 <maxno ofAllowed Areas></maxno 				
>>TAC	М		9.3.3.10	The TAC of the not-allowed TAI.	1	
Last E-UTRAN PLMN Identity	O		PLMN Identity 9.3.3.5	Indicates the E- UTRAN PLMN ID from where the UE formerly handed over to 5GS and which is preferred in case of subsequent mobility to EPS.	YES	ignore
Core Network Type Restriction for Serving PLMN	0		ENUMERATED (EPCForbidden,)	Indicates whether the UE is restricted to connect to EPC for the Serving PLMN as specified in TS 23.501 [9].	YES	ignore
Core Network Type Restriction for Equivalent PLMNs		0 <maxno ofEPLMNs ></maxno 			YES	ignore
>PLMN Identity	M		9.3.3.5	Includes any of the Equivalent PLMNs listed in the Mobility Restriction List IE for which CN Type restriction applies as specified in TS 23.501 [9].	-	
>Core Network Type Restriction	М		ENUMERATED (EPCForbidden, 5GCForbidden,)	Indicates whether the UE is restricted to connect to EPC or to 5GC for this PLMN.		
NPN Mobility Information	0		9.3.1.184		YES	reject

Range bound	Explanation
maxnoofEPLMNs	Maximum no. of equivalent PLMNs. Value is 15.
maxnoofEPLMNsPlusOne	Maximum no. of allowed PLMNs. Value is 16.
maxnoofForbTACs	Maximum no. of forbidden Tracking Area Codes. Value is 4096.
maxnoofAllowedAreas	Maximum no. of allowed or not allowed Tracking Areas. Value is 16.

9.3.1.86 UE Security Capabilities

This IE defines the supported algorithms for encryption and integrity protection in the UE. The Security Capabilities received from NAS signaling shall not be modified or truncated when forwarded to NG-RAN nodes and the NG-RAN nodes store and send the complete bitmaps without modification or truncation as specified in TS 38.300 [8].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR Encryption Algorithms	M		BIT STRING (SIZE(16,))	Each position in the bitmap represents an encryption algorithm: "all bits equal to 0" – UE supports no other algorithm than NEA0, "first bit" – 128-NEA1, "second bit" – 128-NEA2, "third bit" – 128-NEA3, "fourth to seventh bit" are mapped from bit 4 to bit 1 of octet 3 in the UE Security Capability IE defined in TS 24.501 [26], other bits reserved for future use. Value '1' indicates support and value '0' indicates no support of the algorithm. Algorithms are defined in TS 33.501 [13].
NR Integrity Protection Algorithms	M		BIT STRING (SIZE(16,))	Each position in the bitmap represents an integrity protection algorithm: "all bits equal to 0" – UE supports no other algorithm than NIA0, "first bit" – 128-NIA1, "second bit" – 128-NIA2, "third bit" – 128-NIA3, "fourth to seventh bit" are mapped from bit 4 to bit 1 of octet 4 in the UE Security Capability IE defined in TS 24.501 [26], other bits reserved for future use. Value '1' indicates support and value '0' indicates no support of the algorithm. Algorithms are defined in TS 33.501 [13].
E-UTRA Encryption Algorithms	M		BIT STRING (SIZE(16,))	Each position in the bitmap represents an encryption algorithm: "all bits equal to 0" – UE supports no other algorithm than EEA0, "first bit" – 128-EEA1, "second bit" – 128-EEA2, "third bit" – 128-EEA3, "fourth to seventh bit" are mapped from bit 4 to bit 1 of octet 5 in the UE Security Capability IE defined in TS 24.501 [26], other bits reserved for future use. Value '1' indicates support and value '0' indicates no support of the algorithm. Algorithms are defined in TS 33.401 [27].

E-UTRA Integrity Protection Algorithms	M	BIT STRING (SIZE(16,))	Each position in the bitmap represents an encryption algorithm: "all bits equal to 0" – UE supports no other algorithm than EIAO, "first bit" – 128-EIA1, "second bit" – 128-EIA2, "third bit" – 128-EIA3, "fourth to seventh bit" are mapped from bit 4 to bit 1 of octet 6 in the UE Security Capability IE defined in TS 24.501 [26], other bits reserved for future use. Value '1' indicates support and value '0' indicates no support of the algorithm. Algorithms are defined in TS 33 401 [27]
			33.401 [27].

9.3.1.87 Security Key

This IE is used to apply security in the NG-RAN for different scenarios as defined in TS 33.501 [13].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Security Key	M		BIT STRING (SIZE(256))	Key material for NG-RAN node or Next Hop Key as defined in TS 33.501 [13]

9.3.1.88 Security Context

This IE provides security related parameters to the NG-RAN node which are used to derive security keys for user plane traffic and RRC signalling messages and for security parameter generation for subsequent mobility, see TS 33.501 [13].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Next Hop Chaining Count	М		INTEGER (07)	Next Hop Chaining Counter (NCC) defined in TS 33.501 [13].
Next-Hop NH	М		Security Key 9.3.1.87	The NH together with the NCC is used to derive the security configuration as defined in TS 33.501 [13].

9.3.1.89 IMS Voice Support Indicator

This IE is set by the NG-RAN node to indicate whether the UE radio capabilities are compatible with the network configuration for IMS voice.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IMS Voice Support	M		ENUMERATED	
Indicator			(Supported, Not	
			Supported,)	

9.3.1.90 Paging DRX

This IE indicates the Paging DRX as defined in TS 38.304 [12] and TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging DRX	M		ENUMERATED (32, 64, 128, 256,)	Unit: [number of radioframes]

9.3.1.91 RRC Inactive Transition Report Request

This IE is used to request the NG-RAN node to report or stop reporting to the 5GC when the UE enters or leaves RRC_INACTIVE state.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC Inactive Transition Report Request	М		ENUMERATED (Subsequent state transition report, Single RRC connected state report, Cancel report,)	

9.3.1.92 RRC State

This IE indicates the RRC state of the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC State	M		ENUMERATED (Inactive, Connected,)	Indicates the current RRC state of the UE.

9.3.1.93 Expected UE Behaviour

This IE indicates the behaviour of a UE with predictable activity and/or mobility behaviour, to assist the NG-RAN node in e.g. determining the optimum RRC connection time or helping with the RRC_INACTIVE state transition and RNA configuration (e.g. size and shape of the RNA).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Expected UE Activity Behaviour	0		9.3.1.94	
Expected HO Interval	0		ENUMERATED (sec15, sec30, sec60, sec90, sec120, sec180, long-time,)	Indicates the expected time interval between inter NG-RAN node handovers. If "long-time" is included, the interval between inter NG-RAN node handovers is expected to be longer than 180 seconds.
Expected UE Mobility	0		ENUMERATED (stationary, mobile,)	Indicates whether the UE is expected to be stationary or mobile.
Expected UE Moving Trajectory		01		Indicates the UE's expected geographical movement.
>Expected UE Moving Trajectory Item		1 <maxnoofc ellsUEMovingT rajectory></maxnoofc 		Includes list of visited and non- visited cells, where visited cells are listed in the order the UE visited them with the most recent cell being the first in the list. Non- visited cells are included immediately after the visited cell they are associated with.
>>NG-RAN CGI	М		9.3.1.73	
>>Time Stayed in Cell	0		INTEGER (04095)	Included for visited cells and indicates the time a UE stayed in a cell in seconds. If the UE stays in a cell more than 4095 seconds, this IE is set to 4095.

Range bound	Explanation	
maxnoofCellsUEMovingTrajectory	Maximum no. of cells of UE moving trajectory. Value is 16.	

9.3.1.94 Expected UE Activity Behaviour

This IE indicates information about the expected "UE activity behaviour" of the UE or the PDU session as defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Expected Activity Period	0		INTEGER (130I40I50I60I80I 100I120I150I180I 181,)	If set to "181" the expected activity time is longer than 180 seconds. The remaining values indicate the expected activity time in [seconds].
Expected Idle Period	0		INTEGER (130I40I50I60I80I 100I120I150I180I 181,)	If set to "181" the expected idle time is longer than 180 seconds. The remaining values indicate the expected idle time in [seconds].
Source of UE Activity Behaviour Information	O		ENUMERATED (subscription information, statistics,)	If "subscription information" is indicated, the information contained in the <i>Expected Activity Period</i> IE and the <i>Expected Idle Period</i> IE, if present, is derived from subscription information. If "statistics" is indicated, the information contained in the <i>Expected Activity Period</i> IE and the <i>Expected Idle Period</i> IE, if present, is derived from statistical information.

9.3.1.95 UE History Information

This IE contains information about cells that a UE has been served by in active state prior to the target cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Last Visited Cell Item		1 <maxnoofc ellsinUEHistory Info></maxnoofc 		Most recent information is added to the top of this list.
>Last Visited Cell Information	М		9.3.1.96	

Range bound	Explanation
maxnoofCellsinUEHistoryInfo	Maximum no. of cells in the UE history information. Value is 16.

9.3.1.96 Last Visited Cell Information

This IE may contain cell specific information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Last Visited Cell Information	М			
>NG-RAN Cell				
>>Last Visited NG-RAN Cell Information	М		9.3.1.97	
>E-UTRAN Cell				
>>Last Visited E-UTRAN Cell Information	М		OCTET STRING	Defined in TS 36.413 [16].
>UTRAN Cell				
>>Last Visited UTRAN Cell Information	M		OCTET STRING	Defined in TS 25.413 [28].
>GERAN Cell				
>>Last Visited GERAN Cell Information	М		OCTET STRING	Defined in TS 36.413 [16].

9.3.1.97 Last Visited NG-RAN Cell Information

This IE contains information about a cell. In case of NR cell, this IE contains information about a set of NR cells with the same NR ARFCN for reference point A, and the *Global Cell ID* IE identifies one of the NR cells in the set. The information is to be used for RRM purposes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Global Cell ID	M		NG-RAN CGI	•	-	
			9.3.1.73			
Cell Type	M		9.3.1.98		-	
Time UE Stayed in Cell	M		INTEGER (04095)	The duration of time the UE stayed in the cell, or set of NR cells with the same NR ARFCN for reference point A, in seconds. If the duration is more than 4095s, this IE is set to 4095.	-	
Time UE Stayed in Cell Enhanced Granularity	0		INTEGER (040950)	The duration of time the UE stayed in the cell, or set of NR cells with the same NR ARFCN for reference point A, in 1/10 seconds. If the duration is more than 4095s, this IE is set to 40950.	-	
HO Cause Value	0		Cause 9.3.1.2	The cause for the handover.	-	
Last Visited PSCell List		0 <maxno ofPSCells PerPrimar yCellinUE HistoryInfo ></maxno 		List of cells configured as PSCells. Most recent PSCell related information is added to the top of the list.	YES	ignore
>Last Visited PSCell Information	М		9.3.1.235	The PSCell related information.	-	

Range bound	Explanation
maxnoofPSCellsPerPrimaryCellinUEH	Maximum number of last visited PSCell information records that can be
istoryInfo	reported in the IE. Value is 8.

9.3.1.98 Cell Type

This IE provides the cell coverage area.

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

9.3.1.99 Associated QoS Flow List

This IE indicates the list of QoS flows associated with e.g. a DRB or UP TNL endpoint.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Associated QoS Flow Item		1 <maxno ofQoSFlo</maxno 			-	
0.051 11 11	1.4	WS>	0.0.1.51			
>QoS Flow Identifier	M		9.3.1.51		-	
>QoS Flow Mapping	0		ENUMERATED		-	
Indication			(ul, dl,)			
>Current QoS	0		Alternative QoS	Index to the	YES	ignore
Parameters Set Index			Parameters Set	currently fulfilled		
			Index	alternative QoS		
			9.3.1.152	parameters set	1	

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

9.3.1.100 Information on Recommended Cells and RAN Nodes for Paging

This IE provides information on recommended cells and NG-RAN nodes for paging.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Recommended Cells for Paging	М		9.3.1.71	
Recommended RAN Nodes for Paging	М		9.3.1.101	

9.3.1.101 Recommended RAN Nodes for Paging

This IE contains recommended NG-RAN nodes for paging.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Recommended RAN Node List		1		
>Recommended RAN Node Item		1 <maxnoofr ecommendedR ANNodes></maxnoofr 		Includes visited and non-visited NG-RAN nodes, where visited NG-RAN nodes are listed in the order the UE visited them with the most recent NG-RAN node being the first in the list. Non-visited NG-RAN nodes are included after the visited NG-RAN node they are associated with.
>>CHOICE AMF Paging Target				The AMF paging target is either an NG-RAN node identity or a TAI as specified in TS 38.300 [8].
>>>RAN Node				
>>>>Global RAN Node ID	M		9.3.1.5	
>>>TAI				
>>>TAI	М		9.3.3.11	

Range bound	Explanation		
maxnoofRedommendedRANNodes	Maximum no. of recommended NG-RAN nodes. Value is 16.		

9.3.1.102 PDU Session Aggregate Maximum Bit Rate

This IE is applicable for all Non-GBR QoS flows per PDU session which is defined for the downlink and the uplink direction and is provided by the SMF to the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Aggregate Maximum Bit Rate		1		Applicable for Non-GBR QoS flows.
>PDU Session Aggregate Maximum Bit Rate Downlink	M		Bit Rate 9.3.1.4	Indicates the PDU session Aggregate Maximum Bit Rate as specified in TS 23.501 [9] in the downlink direction.
>PDU Session Aggregate Maximum Bit Rate Uplink	M		Bit Rate 9.3.1.4	Indicates the PDU session Aggregate Maximum Bit Rate as specified in TS 23.501 [9] in the uplink direction.

9.3.1.103 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 Integrity Protected Data Rate	M		ENUMERATED (64kbps, max UE rate,)	Defines the upper bound of the aggregate data rate of user plane integrity protected data for either UL or DL.

9.3.1.104 Overload Response

This IE indicates the required behaviour of the NG-RAN node in an overload situation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Overload Response	М			
>Overload Action				
>>Overload Action	M		9.3.1.105	

9.3.1.105 Overload Action

This IE indicates which signalling traffic is subject to rejection by the NG-RAN node in an AMF overload situation as defined in TS 23.501 [9].

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

9.3.1.106 Traffic Load Reduction Indication

This IE indicates the percentage of the type of traffic relative to the instantaneous incoming rate at the NG-RAN node, as indicated in the *Overload Action* IE, to be rejected.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Traffic Load Reduction Indication	M		INTEGER (199)	

9.3.1.107 Slice Overload List

This IE indicates the list of overloaded slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Slice Overload Item		1 <maxnoofsli celtems></maxnoofsli 		
>S-NSSAI	M		9.3.1.24	

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

9.3.1.108 RAN Status Transfer Transparent Container

This IE is produced by the source NG-RAN node and is transmitted to the target NG-RAN node. It is used for intra 5GC NG handover.

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRBs Subject to Status Transfer List		1			-	•
>DRBs Subject to Status Transfer Item		1 <maxn oof DRBs></maxn 			-	
>>DRB ID	M		9.3.1.53		-	
>>CHOICE UL DRB Status	М				-	
>>>12 bits						
>>>>UL COUNT Value	М		COUNT Value for PDCP SN Length 12 9.3.1.109	PDCP-SN and HFN of the first missing UL PDCP SDU in case of 12 bit long PDCP- SN.	-	
>>>>Receive Status of UL PDCP SDUs	O		BIT STRING (SIZE(12048))	The IE is used in case of 12 bit long PDCP-SN. The first bit indicates the status of the SDU after the First Missing UL PDCP SDU. The Mh 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.	-	
>>>18 bits						
>>>>UL COUNT Value	М		COUNT Value for PDCP SN Length 18 9.3.1.110	PDCP-SN and HFN of the first missing UL PDCP SDU in case of 18 bit long PDCP- SN.	-	

>>>>Receive Status of UL PDCP SDUs	O	BIT STRING (SIZE(1131072))	The IE is used in case of 18 bit long PDCP-SN. The first bit indicates the status of the SDU after the First Missing UL PDCP SDU. The N th 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.	-	
>>CHOICE DL DRB Status	М			-	
>>>12 bits					
>>>>DL COUNT Value	М	COUNT Value for PDCP SN Length 12 9.3.1.109	PDCP-SN and HFN that the target NG-RAN node should assign for the next DL PDCP SDU not having an SN yet in case of 12 bit long PDCP- SN.	-	
>>>18 bits	NA	COLINIT Value	DDCD CN and		
>>>>DL COUNT Value	М	COUNT Value for PDCP SN Length 18 9.3.1.110	PDCP-SN and HFN that the target NG-RAN node should assign for the next DL PDCP SDU not having an SN yet in case of 18 bit long PDCP- SN.	-	
>>Old Associated QoS Flow List - UL End Marker Expected	0	Associated QoS Flow List 9.3.1.99	Indicates that the source NG-RAN node has initiated QoS flow remapping and has not yet received SDAP end markers, as described in TS 38.300 [8].	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs allowed towards one UE. Value is 32.

9.3.1.109 COUNT Value for PDCP SN Length 12

This IE contains a PDCP sequence number and a hyper frame number in case of 12 bit long PDCP-SN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDCP SN Length 12	M		INTEGER (04095)	
HFN for PDCP SN Length	M		INTEGER	
12			(01048575)	

9.3.1.110 COUNT Value for PDCP SN Length 18

This IE contains a PDCP sequence number and a hyper frame number in case of 18 bit long PDCP-SN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDCP SN Length 18	М		INTEGER (0262143)	
HFN for PDCP SN Length 18	М		INTEGER (016383)	

9.3.1.111 RRC Establishment Cause

This IE indicates the reason for RRC Connection Establishment as received from the UE in the *EstablishmentCause* defined in TS 38.331 [18] and TS 36.331 [21], or the reason for RRC Connection Resume as received from the UE in the *ResumeCause* defined in TS 38.331 [18] and TS 36.331 [21], or the reason for RRC Connection Establishment as received from the UE in the *EstablishmentCause-NB* defined in TS 36.331 [21].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC Establishment Cause	M		ENUMERATED (emergency, highPriorityAccess, mt-Access, mo-Signalling, mo-Data, mo-VoiceCall, mo-VideoCall, mo-SMS, mps-PriorityAccess, mcs-PriorityAccess,, notAvailable, mo- ExceptionData)	The notAvailable value is used in case the UE is re-establishing an RRC connection but there is fallback to RRC connection establishment as described in TS 38.331 [18], or the ResumeCause received from the UE does not map to any other value of the RRC Establishment Cause IE.

9.3.1.112 Warning Area Coordinates

This IE contains the affected alert area coordinates of a warning message, and will be broadcast over the radio interface.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Warning Area Coordinates	М		OCTET STRING (SIZE(11024))	

9.3.1.113 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 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Network Instance	М		INTEGER (1256,)	

9.3.1.114 Secondary RAT Usage Information

This IE provides information on the secondary resources used with MR-DC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Usage Report		01		
>RAT Type	M		ENUMERATED (nR, e-UTRA,, nR- unlicensed, eUTRA- unlicensed)	
>PDU Session Timed Report List	M		Volume Timed Report List 9.3.1.115	
QoS Flows Usage Report List		01		
>QoS Flow Usage Report Item		1 <maxnoofq oSFlows></maxnoofq 		
>>QoS Flow Indicator	М		9.3.1.51	
>>RAT Type	M		ENUMERATED (nR, e-UTRA,, nR- unlicensed, eUTRA- unlicensed)	
>>QoS Flows Timed Report List	М		Volume Timed Report List 9.3.1.115	

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

9.3.1.115 Volume Timed Report List

This IE provides information on the data usage.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Volume Timed Report		1 <maxnoofti< td=""><td></td><td></td></maxnoofti<>		
Item		mePeriods>		
>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 [25]. It indicates the start time of the collecting period of the included Usage Count UL IE and Usage Count DL IE.
>End Timestamp	M		OCTET STRING (SIZE(4))	UTC time encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [25]. It indicates the end time of the collecting period of the included Usage Count UL IE and Usage Count DL IE.
>Usage Count UL	М		INTEGER (02 ⁶⁴ -1)	The unit is: octets.
>Usage Count DL	M		INTEGER (02 ⁶⁴ -1)	The unit is: octets.

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

9.3.1.116 Redirection for Voice EPS Fallback

This IE is used to indicate that the AMF and the UE support the redirection for voice for EPS Fallback.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Redirection for Voice EPS	M		ENUMERATED	
Fallback			(possible, not-	
			possible,)	

9.3.1.117 UE Retention Information

This IE allows the NG-RAN node and the AMF to indicate whether prior UE related contexts and related UE-associated logical NG-connections and RRC connections are intended to be retained.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Retention Information	M		ENUMERATED	
			(ues-retained,)	

9.3.1.118 UL Forwarding

This IE indicates that the QoS flow is proposed for forwarding of uplink packets.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL Forwarding	M		ENUMERATED	
			(UL forwarding	
			proposed,)	

9.3.1.119 CN Assisted RAN Parameters Tuning

This IE provides information for assisting in parameters tuning of the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Expected UE Behaviour	0		9.3.1.93	This IE may be present in case the Core Network Assistance Information for RRC INACTIVE IE is not included and is ignored otherwise.

9.3.1.120 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 [43]

9.3.1.121 Data Forwarding Response E-RAB List

This IE is used at inter-system HO to provide DL data forwarding address information, if direct data forwarding is applied.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Data Forwarding Response E-RAB List		1 <maxnoofer ABs></maxnoofer 		The list may include the same DL Forwarding UP TNL Information for multiple E-RABs.
>E-RAB ID	М		9.3.2.3	
>DL Forwarding UP TNL Information	M		UP Transport Layer Information 9.3.2.2	

Range bound	Explanation	
maxnoofE-RABs	Maximum no. of E-RABs. Value is 256.	

9.3.1.122 gNB Set ID

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

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

9.3.1.123 RNC-ID

The RNC-ID is used to identify an RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RNC-ID	М		INTEGER (04095)	

9.3.1.124 Extended RNC-ID

This IE is used to identify an RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended RNC-ID	M		INTEGER (409665535)	This IE is used if the RNC identity has a value larger than 4095.

9.3.1.125 RAT Information

This IE provides RAT related information associated with a TAC, used as described in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
RAT Information	M		ENUMERATED	
			(unlicensed, nb-	
			IoT,, nR-LEO,	
			nR-MEO,	
			nR-GEO,	
			nR-OTHERSAT)	

9.3.1.126 Extended RAT Restriction Information

This IE provides RAT restrictions as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Primary RAT Restriction	М		BIT STRING { e-UTRA (0), nR (1), nR- unlicensed (2), nR- LEO (3), nR-MEO (4), nR-GEO (5), nR-OTHERSAT (6)} (SIZE(8,))	Each position in the bitmap represents a Primary RAT. If a bit is set to "1", the respective RAT is restricted for the UE. If a bit is set to "0", the respective RAT is not restricted for the UE. Bit 7 reserved for future use. The Primary RAT is the RAT used in the access cell, or target cell.
Secondary RAT Restriction	M		BIT STRING { e-UTRA (0), nR (1), e-UTRA- unlicensed (2), nR- unlicensed (3)} (SIZE(8,))	Each position in the bitmap represents a Secondary RAT. If a bit is set to "1", the respective RAT is restricted for the UE. If a bit is set to "0", the respective RAT is not restricted for the UE. Bits 4-7 reserved for future use. A Secondary RAT is a RAT, distinct from the UE's primary RAT, used in any cell serving the UE excluding the PCell.

9.3.1.127 SgNB UE X2AP ID

This IE uniquely identifies an UE over the X2 interface within an en-gNB.

The usage of this IE is defined in TS 37.340 [32].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SgNB UE X2AP ID	М		INTEGER (0 2 ³² -1)	

9.3.1.128 SRVCC Operation Possible

This IE indicates that both UE and AMF are SRVCC-capable. NG-RAN behaviour on receipt of this IE is specified in TS 23.216 [31].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SRVCC Operation Possible	M		ENUMERATED (Possible, not Possible,)	The value "Possible" indicates that UE and AMF are SRVCC capable.

9.3.1.129 IAB Authorized

This IE provides information about the authorization status of the IAB node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB Authorized	M		ENUMERATED (authorized, not authorized,)	Indicates the IAB node authorization status.

9.3.1.130 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	0		TSC Assistance Information 9.3.1.131	
TSC Assistance Information Uplink	0		TSC Assistance Information 9.3.1.131	

9.3.1.131 TSC Assistance Information

This IE provides the TSC assistance information for a TSC QoS flow in the uplink or downlink (see TS 23.501 [9]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Periodicity	M		9.3.1.132		-	
Burst Arrival Time	0		9.3.1.133		-	
Survival Time	0		9.3.1.221		YES	ignore

9.3.1.132 Periodicity

This IE indicates the Periodicity of the TSC QoS flow as defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Periodicity	М		INTEGER (0640000,)	Periodicity expressed in units of 1 us.

9.3.1.133 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 [18]. The value is truncated to 1 us granularity.

9.3.1.134 Redundant QoS Flow Indicator

This IE provides the redundant QoS flow indicator for a QoS flow as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Redundant QoS Flow Indicator	M		ENUMERATED (true, false)	This IE indicates whether 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.

9.3.1.135 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 (065535,)	Upper bound value for the delay that a packet may experience expressed in unit of 0.01ms.

9.3.1.136 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	М		ENUMERATED (v1, v2,)		-	
PDU Session Pair ID	0		INTEGER (0 255,)	as defined in TS 23.501 [9]. This IE may be present in the request message and is ignored otherwise.	YES	ignore

9.3.1.137 NB-IoT Default Paging DRX

This IE indicates the NB-IoT Default Paging DRX as defined in TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NB-IoT Default Paging DRX	М		ENUMERATED	Unit: [number of radioframes]
			(128, 256, 512, 1024,)	

9.3.1.138 NB-IoT Paging eDRX Information

This IE indicates the NB-IoT Paging eDRX parameters as defined in TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NB-IoT Paging eDRX Cycle	M		ENUMERATED (hf2, hf4, hf6, hf8, hf10, hf12, hf14, hf16, hf32, hf64, hf128, hf256, hf512, hf1024,)	T _{eDRX} defined in TS 36.304 [29]. Unit: [number of hyperframes].
NB-IoT Paging Time Window	0		ENUMERATED (s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16,)	Unit: [2.56 seconds]

9.3.1.139 NB-IoT Paging DRX

This IE indicates the NB-IoT UE specific Paging DRX as defined in TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NB-IoT Paging DRX	М		ENUMERATED (32, 64, 128, 256, 512,	Unit: [number of radioframes]
			1024,)	

9.3.1.140 Enhanced Coverage Restriction

This IE provides information on the restriction information of using Coverage Enhancement.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Enhanced Coverage Restriction	0		ENUMERATED (restricted,)	Indicates whether the UE is restricted to use coverage enhancement. Value "restricted" indicates that the UE is not allowed to use coverage enhancement.

9.3.1.141 Paging Assistance Data for CE Capable UE

This IE provides Assistance Data for paging CE capable UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global Cell ID	M		E-UTRA CGI 9.3.1.9	
Coverage Enhancement Level	М		OCTET STRING	Includes either the UEPagingCoverageInformation message as defined in TS 36.331 [21], or the UEPagingCoverageInformation-NB message as defined in TS 36.331 [21].

9.3.1.142 UE Radio Capability ID

This IE contains the UE Radio Capability ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Radio Capability ID	M		OCTET STRING	Defined in TS 23.003 [23].

9.3.1.143 WUS Assistance Information

This IE provides WUS Assistance Information to be used by the NG-RAN node for determining the WUS group for the UE.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Paging Probability	M		ENUMERATED	Unit: percentage
Information			(p00, p05, p10, p15,	
			p20, p25, p30, p35,	
			p40, p45, p50, p55,	
			p60, p65, p70, p75,	
			p80, p85, p90, p95,	
			p100,)	

9.3.1.144 UE Differentiation Information

This IE is generated by the AMF based on the UE subscription information, it provides the Expected UE Behavior Information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Periodic Communication Indicator	0		ENUMERATED (periodically, on demand,)	This IE indicates whether the UE communicates periodically or not, e.g. only on demand.
Periodic Time	0		INTEGER (13600,)	This IE indicates the interval time of periodic communication, the unit is: second
Scheduled Communication Time		01		This IE indicates the time zone and day of the week when the UE is available for communication.
>Day of Week	0		BIT STRING (SIZE(7))	Each position in the bitmap represents a day of the week: first bit = Mon, second bit =Tue, third bit =Wed, and so on. Value '1' indicates 'scheduled. Value '0' indicates 'not scheduled'. If Day-Of-Week is not provided, this is interpreted as every day of the week.
>Time of Day Start	0		INTEGER (086399,)	This IE indicates the time to start of the day, each value represents the corresponding second since 00:00 of the day. If Time-Of-Day-Start is not provided, starting time is start of the day(s) indicated by Day-Of-Week-Mask.
>Time of Day End	0		INTEGER (086399,)	This IE indicates the time to start of the day, each value represents the corresponding second since 00:00 of the day. The value of this IE should be bigger than the value of Time of Day Start IE. If Time-Of-Day-End is not provided, ending time is end of the day(s) indicated by Day-Of-
Stationary Indication	0		ENUMERATED (stationary, mobile,)	Week-Mask.
Traffic Profile	0		ENUMERATED (single packet, dual packets, multiple packets,)	"single packet" indicates single packet transmission (UL or DL), "dual packets" indicates dual packet transmission (UL with subsequent DL, or DL with subsequent UL), "multiple packets" indicates multiple packets transmission.
Battery Indication	0		ENUMERATED (battery powered, battery powered not rechargeable or replaceable, not battery powered,)	"battery powered" indicates that the UE is battery powered and the battery is rechargeable/replaceable, "battery powered not rechargeable or replaceable" indicates that the UE is battery powered but the battery is not rechargeable/replaceable, "not battery powered" indicates that the UE is not battery powered.

9.3.1.145 NB-IoT UE Priority

This IE provides the NB-IoT UE Priority and to be used by the NG-RAN to prioritise between UEs accessing via NB-IoT.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NB-IoT UE Priority	М		INTEGER (0255,)	Lower value indicates higher priority.

9.3.1.146 NR V2X Services Authorized

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Vehicle UE	0		ENUMERATED (authorized, not authorized,)	Indicates whether the UE is authorized as Vehicle UE
Pedestrian UE	0		ENUMERATED (authorized, not authorized,)	Indicates whether the UE is authorized as Pedestrian UE

9.3.1.147 LTE V2X Services Authorized

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Vehicle UE	0		ENUMERATED (authorized, not authorized,)	Indicates whether the UE is authorized as Vehicle UE
Pedestrian UE	0		ENUMERATED (authorized, not authorized,)	Indicates whether the UE is authorized as Pedestrian UE

9.3.1.148 NR UE Sidelink Aggregate Maximum Bit Rate

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR UE Sidelink Aggregate Maximum Bit Rate	M		Bit Rate 9.3.1.4	Value 0 is not valid, and considered as a logical error by the receiving NG-RAN node.

9.3.1.149 LTE UE Sidelink Aggregate Maximum Bit Rate

This IE provides information on the Aggregate Maximum Bitrate of the UE's sidelink communication for LTE V2X services.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LTE UE Sidelink Aggregate Maximum Bit Rate	М		Bit Rate 9.3.1.4	Value 0 is not valid, and considered as a logical error by the receiving NG-RAN node.

9.3.1.150 PC5 QoS Parameters

This IE provides information on the PC5 QoS parameters of the UE's sidelink communication for NR PC5.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PC5 QoS Flow List		1		
>PC5 QoS Flow Item		1 <maxnoofpc 5QoSFlows></maxnoofpc 		
>>PQI	М		INTEGER (0255,)	PQI is a special 5QI as specified in TS 23.501 [9].
>>PC5 Flow Bit Rates		01		Only applies for GBR QoS Flows.
>>>Guaranteed Flow Bit Rate	M		Bit Rate 9.3.1.4	Guaranteed Bit Rate for the PC5 QoS flow. Details in TS 23.501 [9].
>>>Maximum Flow Bit Rate	M		Bit Rate 9.3.1.4	Maximum Bit Rate for the PC5 QoS flow. Details in TS 23.501 [9].
>>Range	0		ENUMERATED (m50, m80, m180, m200, m350, m400, m500, m700, m1000,)	Only applies for groupcast.
PC5 Link Aggregate Bit Rates	0		Bit Rate 9.3.1.4	Only applies for non-GBR QoS Flows.

Range bound	Explanation
maxnoofPC5QoSFlows	Maximum no. of PC5 QoS flows allowed towards one UE. Value is 2048.

9.3.1.151 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		1 <maxnoofqo< th=""><th></th><th></th></maxnoofqo<>		
Parameters Set Item		SparaSets>		
>Alternative QoS	M		9.3.1.152	
Parameters Set Index				
>Guaranteed Flow Bit Rate	0		Bit Rate	
Downlink			9.3.1.4	
>Guaranteed Flow Bit Rate	0		Bit Rate	
Uplink			9.3.1.4	
>Packet Delay Budget	0		9.3.1.80	
>Packet Error Rate	0		9.3.1.81	

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

9.3.1.152 Alternative QoS Parameters Set Index

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative QoS Parameters Set Index	М		INTEGER (18,)	Indicates the index of the item within the the Alternative QoS Parameters Set List IE corresponding to the currently fulfilled alternative QoS parameters set.

9.3.1.153 Alternative QoS Parameters Set Notify Index

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative QoS Parameters Set Notify Index	M		INTEGER (08,)	Indicates the index of the item within the the Alternative QoS Parameters Set List IE corresponding to the currently fulfilled alternative QoS parameters set. Value 0 indicates that NG-RAN cannot even fulfil the lowest alternative parameters set.

9.3.1.154 E-UTRA Paging eDRX Information

This IE indicates the E-UTRA Paging eDRX parameters as defined in TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
E-UTRA Paging eDRX Cycle	М		ENUMERATED (hfhalf, hf1, hf2, hf4, hf6, hf8, hf10, hf12, hf14, hf16, hf32, hf64, hf128, hf256,)	TeDRX defined in TS 36.304 [29]. Unit: [number of hyperframes].
E-UTRA Paging Time Window	0		ENUMERATED (\$1, \$2, \$3, \$4, \$5, \$6, \$7, \$8, \$9, \$10, \$11, \$12, \$13, \$14, \$15, \$16,)	Unit: [1.28 second].

9.3.1.155 CE-mode-B Restricted

This IE provides information on the restriction information of using Coverage Enhancement Mode B.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CE-mode-B Restricted	M		ENUMERATED (restricted, not- restricted,)	Indicates whether the UE is restricted to use coverage enhancement.
				Value "restricted" indicates that the UE is not allowed to use coverage enhancement mode B.
				Value "not-restricted" indicates
				that the UE is allowed to use coverage enhancement mode B.

9.3.1.156 CE-mode-B Support Indicator

This IE indicates whether CE-mode-B as specified in TS 36.306[42] is supported for the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CE-mode-B Support	М		ENUMERATED	
Indicator			(supported,)	

9.3.1.157 LTE-M Indication

This IE is provided by the NG-RAN node to inform that the UE indicates category M1 or M2 in its UE Radio Capability.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LTE-M Indication	М		ENUMERATED	
			(LTE-M,)	

9.3.1.158 Suspend Request Indication

This IE indicates that the NG-RAN node requests immediate transition to RRC idle with suspend, as specified in TS 23.502 [10].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Suspend Request Indication	M		ENUMERATED	
			(suspend-requested,)	

9.3.1.159 Suspend Response Indication

This IE is used by the AMF to inform the NG-RAN node to suspend the UE and send it to RRC_IDLE, as specified in TS 23.502 [10].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Suspend Response	M		ENUMERATED	
Indication			(suspend-indicated,	
)	

9.3.1.160 UE User Plane CloT Support Indicator

This IE indicates whether User Plane CIoT 5GS Optimisation as specified in TS 23.501 [9] is supported for the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE User Plane CloT Support	M		ENUMERATED	
Indicator			(supported,)	

9.3.1.161 Global TNGF ID

This IE is used to globally identify a TNGF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE TNGF ID	M			
>TNGF ID				
>>TNGF ID	М		BIT STRING (SIZE(32,))	

9.3.1.162 Global W-AGF ID

This IE is used to globally identify a W-AGF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	М		9.3.3.5	
CHOICE W-AGF ID	M			
>W-AGF ID				
>>W-AGF ID	M		BIT STRING	
			(SIZE(16,))	

9.3.1.163 Global TWIF ID

This IE is used to globally identify a TWIF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE TWIF ID	M			
>TWIF ID				
>>TWIF ID	М		BIT STRING (SIZE(32,))	

9.3.1.164 W-AGF User Location Information

This IE indicates the location information via wireline access as specified in TS 23.316 [34].

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE W-AGF User Location Information	М				-	
>Global Line ID					-	
>>Global Line ID	М		OCTET STRING	Encoded as defined in TS 23.003 [23].	-	
>>Line Type	0		ENUMERATED (DSL, PON,)		-	
>HFC Node ID					-	
>>HFC Node ID	M		OCTET STRING	Indicates the identifier of the HFC node as specified in [37]. Encoded as defined in TS 23.003 [23].	-	
>Global Cable ID		<u> </u>			YES	ignore
>>Global Cable ID	М		OCTET STRING	Encoded as defined in TS 23.003 [23].	-	

9.3.1.165 Global eNB ID

This IE is used to globally identify an eNB (see TS 36.401 [38]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
CHOICE <i>eNB ID</i>	M			
>Macro eNB ID				
>>Macro eNB ID	M		BIT STRING (SIZE(20))	Equal to the 20 leftmost bits of the <i>Cell Identity</i> IE contained in the <i>E-UTRAN CGI</i> IE (see TS 36.423 [40] subclause 9.3.1.9) of each cell served by the eNB.
>Home eNB ID				
>>Home eNB ID	M		BIT STRING (SIZE(28))	Equal to the <i>Cell Identity</i> IE contained in the <i>E-UTRAN CGI</i> IE (see TS 36. 423 [40] subclause 9.3.1.9) of the cell served by the eNB.
>Short Macro eNB ID				
>>Short Macro eNB ID	M		BIT STRING (SIZE(18))	Equal to the 18 leftmost bits of the <i>Cell Identity</i> IE (see TS 36. 423 [40] subclause 9.3.1.9) of each cell served by the eNB.
>Long Macro eNB ID		·		
>>Long Macro eNB ID	M		BIT STRING (SIZE(21))	Equal to the 21 leftmost bits of the <i>Cell Identity</i> IE (see TS 36. 423 [40] subclause 9.3.1.9) of each cell served by the eNB.

9.3.1.166 UE History Information from UE

This IE contains information about mobility history report for a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE UE History Information from UE	М			
>NR				
>>NR Mobility History Report	M		OCTET STRING	VisitedCellInfoList contained in the <i>UEInformationResponse</i> message (TS 38.331 [18]).

9.3.1.167 MDT Configuration

This IE defines the MDT configuration parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT Configuration-NR	0		9.3.1.169	
MDT Configuration-EUTRA	0		9.3.1.170	

9.3.1.168 MDT PLMN List

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT PLMN List		1 <maxnoofm DTPLMNs></maxnoofm 		
>PLMN Identity	M		9.3.3.5	

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

9.3.1.169 MDT Configuration-NR

This IE defines the MDT configuration parameters of NR.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT Activation	М		ENUMERATED (Immediate MDT only, Logged MDT only, Immediate MDT and Trace,)	
CHOICE Area Scope of MDT	M			
>Cell based				
>>Cell ID List for MDT		1 <maxnoofce IIIDforMDT></maxnoofce 		
>>>NR CGI	М		9.3.1.7	
>TA based >>TA List for MDT		1 <maxnoofta forMDT></maxnoofta 		
>>>TAC	М		9.3.3.10	The TAI is derived using the current serving PLMN.
>PLMN wide			NULL	
>TAI based >>TAI List for MDT		1 <maxnoofta forMDT></maxnoofta 		
>>>TAI	M	IOINID 12		
CHOICE MDT Mode	M			
>Immediate MDT				
>>Measurements to Activate	M C-ifM1		BITSTRING (SIZE(8))	Each position in the bitmap indicates a MDT measurement, as defined in TS 37.320 [41]. First Bit = M1, Second Bit= M2, Third Bit = M4, Fourth Bit = M5, Fifth Bit = M6, Sixth Bit = M7, Seventh Bit = logging of M1 from event triggered measurement reports according to existing RRM configuration, other bits reserved for future use. Value "1" indicates "activate" and value "0" indicates "do not activate".
>>M1 Configuration	C-ifM1 C-ifM4			
>>M4 Configuration >>M5 Configuration	C-ifM5		9.3.1.172 9.3.1.173	
>>M6 Configuration	C-ifM6		9.3.1.174	
>>M7 Configuration	C-ifM7		9.3.1.175	
>>Bluetooth Measurement Configuration	0		9.3.1.177	
>>WLAN Measurement Configuration	0		9.3.1.178	
>>MDT Location Information	0		9.3.1.176	
>>Sensor Measurement Configuration	0		9.3.1.179	
>Logged MDT			ENII IMEDATES	This IT is the TO CO CO.
>>Logging interval	M		ENUMERATED (320ms, 640ms, 1280ms, 2560ms, 5120ms, 10240ms, 20480ms, 30720ms, 40960ms, 61440ms, infinity,)	This IE is defined in TS 38.331 [18].
>>Logging duration	М		ENUMERATED (10, 20, 40, 60, 90,120,)	This IE is defined in TS 38.331 [18]. Unit: [minute].
>>CHOICE Report Type	М		NII II I	
>>>Periodical	<u> </u>		NULL	

>>>Event Triggered				
>>>>Event Trigger Logged MDT Configuration	M	9	.3.1.180	
>>Bluetooth Measurement Configuration	0	9	.3.1.177	
>>WLAN Measurement Configuration	0	9	.3.1.178	
>>Sensor Measurement Configuration	0	9	.3.1.179	
>>Area Scope of Neighbour Cells	0	9	.3.1.182	
Signalling Based MDT PLMN List	0		IDT PLMN List .3.1.168	

Range bound	Explanation
maxnoofCellIDforMDT	Maximum no. of Cell ID subject for MDT scope. Value is 32.
maxnoofTAforMDT	Maximum no. of TA subject for MDT scope. Value is 8.

Condition	Explanation
C-ifM1	This IE shall be present if the <i>Measurements to Activate</i> IE has the first bit set to "1".
C-ifM4	This IE shall be present if the <i>Measurements to Activate</i> IE has the third bit set to "1".
C-ifM5	This IE shall be present if the <i>Measurements to Activate</i> IE has the fourth bit set to "1".
C-ifM6	This IE shall be present if the Measurements to Activate IE has the fitth bit set to "1".
C-ifM7	This IE shall be present if the Measurements to Activate IE has the sixth bit set to "1".

9.3.1.170 MDT Configuration-EUTRA

This IE defines the MDT configuration parameters of EUTRA.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT Activation	M		ENUMERATED (Immediate MDT only, Logged MDT only, Immediate MDT and Trace,)	
CHOICE Area Scope of MDT	M			
>Cell based				
>>Cell ID List for MDT		1 <maxnoofce iiidformdt=""></maxnoofce>		
>>>E-UTRA CGI	M		9.3.1.9	
>TA based				
>>TA List for MDT		1 <maxnoofta formdt=""></maxnoofta>		
>>>TAC	М		9.3.3.10	The TAI is derived using the current serving PLMN.
>PLMN wide			NULL	
>TAI based				
>>TAI List for MDT		1 <maxnoofta formdt=""></maxnoofta>		
>>>TAI	М		9.3.3.11	
MDT Mode	М		OCTET STRING	MDTMode IE defined in TS 36.413 [16].
Signalling Based MDT PLMN List	0		MDT PLMN List 9.3.1.168	

Range bound	Explanation
maxnoofCellIDforMDT	Maximum no. of Cell ID subject for MDT scope. Value is 32.
maxnoofTAforMDT	Maximum no. of TA subject for MDT scope. Value is 8.

9.3.1.171 M1 Configuration

This IE defines the parameters for M1 measurement collection.

IE/Group Name			Semantics description	Criticality	Assigned Criticality	
M1 Reporting Trigger	M		ENUMERATED (periodic, A2event-triggered, A2event-triggered periodic,)		-	
M1 Threshold Event A2	C- ifM1A2tri gger				-	
>CHOICE Threshold Type >>RSRP	M				-	
>>>Threshold RSRP	М		INTEGER (0127)	This IE is defined in TS 38.331 [18].	-	
>>RSRQ						
>>>Threshold RSRQ	М		INTEGER (0127)	This IE is defined in TS 38.331 [18].	-	
>>SINR						
>>>Threshold SINR	M		INTEGER (0127)	This IE is defined in TS 38.331 [18].	-	
M1 Periodic Reporting	C- ifperiodic MDT				-	
>Report Interval	M		ENUMERATED (ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, min1, min6, min12, min30, min60)	This IE is defined in TS 38.331 [18]. The value min60 is not used in the specification.	-	
>Report Amount	М		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity)	Number of reports.	-	
>Extended Report Interval	0		ENUMERATED (ms20480, ms40960,)	This IE is the extension of the <i>Report Interval</i> IE. If this IE is present, the <i>Report Interval</i> IE is ignored.	YES	ignore
Include Beam Measurements Indication	0		ENUMERATED (true,)	To configure whether the UE should include beam level measurements.	YES	ignore

Condition	Explanation
C-ifM1A2trigger	This IE shall be present if the M1 Reporting Trigger IE is set to "A2event-
	triggered" or to "A2event-triggered periodic".
C-ifperiodicMDT	This IE shall be present if the M1 Reporting Trigger IE is set to "periodic",
	or to "A2event-triggered periodic".

9.3.1.172 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	М		ENUMERATED (ms1024, ms2048, ms5120, ms10240, min1,)		-	
M4 Links to Log	М		ENUMERATED (uplink, downlink, both- uplink-and- downlink,)		-	
M4 Report Amount	0		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity,)	Number of reports.	YES	ignore

9.3.1.173 M5 Configuration

This IE defines the parameters for M5 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
M5 Collection Period	М	ENUMERATED (ms1024, ms2048, ms5120, ms10240, min1,)			-	
M5 Links to Log	M	ENUMERATED (uplink, downlink, both-uplink-and-downlink,)			-	
M5 Report Amount	0		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity,)	Number of reports	YES	ignore

9.3.1.174 M6 Configuration

This IE defines the parameters for M6 measurement collection.

IE/Group Name	Presence	Range	IE type and	Semantics	Criticality	Assigned
-			reference	description		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	0		ENUMERATED	Number of reports	YES	ignore
			(1, 2, 4, 8, 16,			
			32, 64, infinity,			
)			
M6 Delay Threshold	C-ifUL		ENUMERATED		YES	ignore
			(ms0.25, ms0.5,			
			ms1, ms2, ms4,			
			ms10, ms20,			
			ms50, ms100,			
			ms500,)			

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

9.3.1.175 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 (160,)	Unit: minutes	-	
M7 Links to Log	М		ENUMERATED (uplink, downlink, both-uplink-and-downlink,)		-	
M7 Report Amount	0		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity,)	Number of reports	YES	ignore

9.3.1.176 MDT Location Information

This IE defines the MDT Location Information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT Location Information	М		BITSTRING (SIZE(8))	Each position in the bitmap represents requested location information as defined in TS 37.320 [41]. First Bit = GNSS Other bits are reserved for future use and are ignored if received. Value "1" indicates "activate" and value "0" indicates "do not activate".

9.3.1.177 Bluetooth Measurement Configuration

This IE defines the parameters for Bluetooth measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Bluetooth Measurement	М		ENUMERATED	
Configuration			(Setup,)	
Bluetooth Measurement		01		This IE is present if the Bluetooth
Configuration Name List				Measurement Configuration IE is set to "Setup".
>Bluetooth Measurement		1 <maxnoofblu< td=""><td></td><td></td></maxnoofblu<>		
Configuration Name Item		etoothName>		
>>Bluetooth Measurement	M		OCTET STRING	
Configuration Name			(SIZE (1248))	
BT RSSI	0		ENUMERATED (true,)	In case of Immediate MDT, it corresponds to M8 measurement as defined in TS 37.320 [41].

Range bound	Explanation
maxnoofBluetoothName	Maximum no. of Bluetooth local name used for Bluetooth measurement collection. Value is 4.

9.3.1.178 WLAN Measurement Configuration

This IE defines the parameters for WLAN measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
WLAN Measurement Configuration	М		ENUMERATED (Setup,)	
WLAN Measurement Configuration Name List		01		This IE is present if the Bluetooth Measurement Configuration IE is set to "Setup".
>WLAN Measurement Configuration Name Item		1 <maxnoofw LANName></maxnoofw 		
>>WLAN Measurement Configuration Name	М		OCTET STRING (SIZE (132))	
WLAN RSSI	0		ENUMERATED (true,)	In case of Immediate MDT, it corresponds to M8 as defined in TS 37.320 [41].
WLAN RTT	0		ENUMERATED (true,)	In case of Immediate MDT, it corresponds to M9 as defined in TS 37.320 [41].

Range bound	Explanation
maxnoofWLANName	Maximum no. of WLAN SSID used for WLAN measurement collection. Value is 4.

9.3.1.179 Sensor Measurement Configuration

This IE defines the parameters for Sensor measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Sensor Measurement Configuration	М		ENUMERATED (Setup,)	
Sensor Measurement Configuration Name List		01		
>Sensor Measurement Configuration Name Item		1 <maxnoofse nsorName></maxnoofse 		
>>CHOICE Sensor Name	М			
>>>Uncompensated Barometric				
>>>>Uncompensated Barometric Configuration	М		ENUMERATED (true,)	
>>>UE speed				
>>>>UE Speed Configuration	М		ENUMERATED (true,)	
>>>UE orientation				
>>>>UE orientation Configuration	М		ENUMERATED (true,)	

Range bound	Explanation
maxnoofSensorName	Maximum no. of Sensor local name used for Sensor measurement
	collection. Value is 3

9.3.1.180 Event Trigger Logged MDT Configuration

This IE defines the event trigger logged MDT configuration.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Event trigger type	M			
>Out-of-coverage				
>>Out-of-Coverage Configuration	М		ENUMERATED (true,)	
>L1 Event				
>>CHOICE L1 Event Threshold	M			
>>>RSRP				
>>>>Threshold RSRP	М	INTEGER (0127)		This IE is defined in TS 38.331 [18].
>>>RSRQ				
>>>>Threshold RSRQ	М		INTEGER (0127)	This IE is defined in TS 38.331 [18].
>>Hysteresis	М		INTEGER (030)	This parameter is used within the entry and leave condition of an event triggered reporting condition.
>>Time to Trigger	M		ENUMERATED (ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256, ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560, ms5120)	Time during which specific criteria for the event needs to be met in order to trigger a measurement report.

9.3.1.181 NR Frequency Info

This defines the carrier frequency and bands used in a cell for a given direction (UL or DL) in FDD or for both UL and DL directions in TDD.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR ARFCN	М		INTEGER (0 maxNRARFCN)	RF Reference Frequency as defined in TS 38.104 [39], section 5.4.2.1. The frequency provided in this IE identifies the absolute frequency position of the reference resource block (Common RB 0) of the carrier. Its lowest subcarrier is also known as Point A.
NR Frequency Band List		1		This IE is not used in this specification and is ignored.
>NR Frequency Band Item		1 <maxnoofnr CellBands></maxnoofnr 		
>>NR Frequency Band	М		INTEGER (1 1024,)	Primary NR Operating Band as defined in TS 38.104 [39], section 5.4.2.3. The value 1 corresponds to n1, value 2 corresponds to NR operating band n2, etc.

Range bound	Explanation
maxNRARFCN	Maximum value of NRARFCNs. Value is 3279165.
maxnoofNRCellBands	Maximum no. of frequency bands supported for a NR cell. Value is 32.

9.3.1.182 Area Scope of Neighbour Cells

This IE defines the area scope of neighbour cells for logged MDT.

IE/Group Name	Presence	Range IE type and reference		Semantics description
Area Scope of Neighbour Cells Item	М	1 <maxnooffr eqformdt=""></maxnooffr>		
>NR Frequency Info	M		9.3.1.181	
>PCI List for MDT		0 <maxnoofneig hPClforMDT></maxnoofneig 		
>>NR PCI	М		INTEGER (01007,)	NR Physical Cell ID

Range bound	Explanation
maxnoofFreqforMDT	Maximum no. of Frequency Information subject for MDT scope. Value is 8.
maxnoofNeighPCIforMDT	Maximum no. of Neighbour cells subject for MDT scope. Value is 32.

9.3.1.183 NPN Paging Assistance Information

This IE contains NPN Paging Assistance Information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE NPN Paging Assistance Information	M			
>PNI-NPN Paging Assistance				
>>PNI-NPN Paging Assistance	М		Allowed PNI-NPN List 9.3.3.45	

9.3.1.184 NPN Mobility Information

This IE indicates the access restrictions related to an NPN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE NPN Mobility Information	М			
>SNPN Mobility Information				
>>Serving NID	М		NID 9.3.3.42	
>PNI-NPN Mobility Information				
>>Allowed PNI-NPN List	M		9.3.3.45	

9.3.1.185 Cell CAG Information

This IE provides information about support of closed access groups for a designated cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NG-RAN CGI	М		9.3.1.73	
Cell CAG List	M		9.3.3.47	

9.3.1.186 Target to Source Failure Transparent Container

This IE is used to transparently pass radio related information from the handover target to the handover source through the core network in case of failure of the preparation at the target; it is produced by the target RAN node and is transmitted to the source RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target to Source Failure Transparent Container	М		OCTET STRING	This IE includes a transparent container from the target RAN node to the source RAN node. The octets of the OCTET STRING are encoded according to the specifications of the target system. Note: In the current version of the specification, this IE may carry the Target NG-RAN Node to Source NG-RAN Node Failure Transparent Container IE.

9.3.1.187 Target NG-RAN Node to Source NG-RAN Node Failure Transparent Container

This IE is produced by the target NG-RAN node and is transmitted to the source NG-RAN node in case of preparation failure.

This IE is transparent to the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Cell CAG Information	0		9.3.1.185		-	
NGAP IE Support Information Response List	0		9.3.1.242		YES	ignore

9.3.1.188 DAPS Request Information

The DAPS Indicator IE indicates that the source NG-RAN node requests a DAPS Handover for the concerned DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DAPS Indicator	М		ENUMERATED (DAPS HO required,)	Indicates that DAPS Handover is requested

9.3.1.189 DAPS Response Information

The DAPS Response Indicator IE indicates the per DRB response to a requested DAPS Handover.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DAPS Response Indicator	М		ENUMERATED (DAPS HO accepted, DAPS HO not accepted,)	Indicates that DAPS Handover is accepted or not

9.3.1.190 Early Status Transfer Transparent Container

The Early Status Transfer Transparent Container IE is an information element that is produced by the source NG-RAN node and is transmitted to the target NG-RAN node. This IE is used for the NG DAPS handover case.

This IE is transparent to the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Procedure Stage	M			
>First DL COUNT				
>>DRBs Subject To Early Status Transfer List		1		
>>>DRBs Subject To		1 <maxnoofdr< td=""><td></td><td></td></maxnoofdr<>		
Early Status Transfer Item		Bs>		
>>>>DRB ID	M		9.3.1.53	
>>>>CHOICE First DL COUNT	M			
>>>>12 bits				
>>>>>FIRST DL COUNT Value	М		COUNT Value for PDCP SN Length 12 9.3.1.109	PDCP-SN and Hyper frame number of the first DL SDU that the source NG-RAN node forwards to the target NG-RAN node in case of 12 bit long PDCP-SN
>>>>18 bits				
>>>>>FIRST DL COUNT Value	M		COUNT Value for PDCP SN Length 18 9.3.1.110	PDCP-SN and Hyper frame number of the first DL SDU that the source NG-RAN node forwards to the target NG-RAN node in case of 18 bit long PDCP-SN

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs allowed towards one UE. Value is 32.

9.3.1.191 Extended Slice Support List

This IE indicates a list of supported slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Slice Support Item		1 <maxnoofext SliceItems></maxnoofext 		
>S-NSSAI	M		9.3.1.24	

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

9.3.1.192 UE Capability Info Request

This IE indicates the request to provide to the AMF the UE radio capability related information when retrieved from the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Capability Info Request	M		ENUMERATED	
			(requested,)	

9.3.1.193 Extended RAN Node Name

This IE provides extended human readable name of the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAN Node Name Visible	0		VisibleString (SIZE(1150,))	
RAN Node Name UTF8	0		UTF8String (SIZE(1150,))	

9.3.1.194 MICO All PLMN

This IE indicates that the UE is configured with MICO mode by the AMF for the "all PLMN" as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MICO All PLMN	M		ENUMERATED	
			(true,)	

9.3.1.195 Source Node ID

This IE identifies the source SN for the handover.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Source Node ID	M			
>Source E-UTRAN Node ID				
>>Source en-gNB ID	М		Global gNB ID 9.3.1.6	This IE is used for handover from EN-DC to SA. The source engnB ID is the identity of the source SN.

9.3.1.196 E-UTRAN Composite Available Capacity Group

This IE indicates the overall available resource level in the cell in downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Composite Available Capacity Downlink	M		E-UTRAN Composite Available Capacity 9.3.1.197	For the downlink
Composite Available Capacity Uplink	M		E-UTRAN Composite Available Capacity 9.3.1.197	For the uplink

9.3.1.197 E-UTRAN Composite Available Capacity

This IE indicates the overall available resource level in the cell in either downlink or uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
E-UTRAN Cell Capacity Class Value	0		9.3.1.198	
E-UTRAN Capacity Value	M		9.3.1.199	'0' indicates no resource is available, Measured on a linear scale.

9.3.1.198 E-UTRAN Cell Capacity Class Value

This IE indicates the value that classifies the cell capacity with regards to the other cells. This IE only indicates resources that are configured for traffic purposes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Capacity Class Value	М		INTEGER (1100,)	Value 1 indicates the minimum cell capacity, and 100 indicates the maximum cell capacity. There should be a linear relation between cell capacity and Cell Capacity Class Value.

9.3.1.199 E-UTRAN Capacity Value

This IE indicates the amount of resources that are available relative to the total E-UTRAN resources. The capacity value should be measured and reported so that the minimum E-UTRAN resource usage of existing services is reserved according to implementation. This IE can be weighted according to the ratio of cell capacity class values, if available.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Capacity Value	М		INTEGER (0100)	Value 0 indicates no available capacity, and 100 indicates maximum available capacity. Capacity Value should be measured on a linear scale.

9.3.1.200 E-UTRAN Radio Resource Status

This IE indicates the usage of the PRBs for all traffic in downlink and uplink (TS 36.314 [49], TS 23.203 [50]) and the usage of PDCCH CCEs for downlink and uplink scheduling.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL GBR PRB Usage	M		INTEGER (0100)	
UL GBR PRB Usage	M		INTEGER (0100)	
DL Non-GBR PRB Usage	M		INTEGER (0100)	
UL Non-GBR PRB Usage	M		INTEGER (0100)	
DL Total PRB Usage	M		INTEGER (0100)	
UL Total PRB Usage	M		INTEGER (0100)	
DL Scheduling PDCCH CCE Usage	0		INTEGER (0100)	
UL Scheduling PDCCH CCE Usage	0		INTEGER (0100)	

9.3.1.201 NR Composite Available Capacity Group

This IE indicates the overall available resource level per cell in the cell in downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Composite Available Capacity Downlink	М		NR Composite Available Capacity 9.3.1.202	For the downlink
Composite Available Capacity Uplink	М		NR Composite Available Capacity 9.3.1.202	For the uplink

9.3.1.202 NR Composite Available Capacity

This IE indicates the overall available resource level in the cell in either downlink or uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR Cell Capacity Class Value	0		9.3.1.203	
NR Capacity Value	M		9.3.1.204	'0' indicates no resource is available, measured on a linear scale.

9.3.1.203 NR Cell Capacity Class Value

This IE indicates the value that classifies the cell capacity with regards to the other cells. This IE only indicates resources that are configured for traffic purposes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR Capacity Class Value	М		INTEGER (1100,)	Value 1 indicates the minimum cell capacity, and 100 indicates the maximum cell capacity. There should be a linear relation between cell capacity and Cell Capacity Class Value.

9.3.1.204 NR Capacity Value

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR Capacity Value	М		INTEGER (0100)	Value 0 indicates no available capacity, and 100 indicates maximum available capacity with respect to the whole cell. Capacity Value should be measured on a linear scale.

9.3.1.205 NR Radio Resource Status

This IE indicates the usage of the PRBs per cell for MIMO for all traffic in Downlink and Uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL GBR PRB Usage for MIMO	M		INTEGER (0100)	Per cell DL GBR PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].
UL GBR PRB Usage for MIMO	M		INTEGER (0100)	Per cell UL GBR PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].
DL Non-GBR PRB Usage for MIMO	M		INTEGER (0100)	Per cell DL Non-GBR PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].
UL Non-GBR PRB Usage for MIMO	M		INTEGER (0100)	Per cell UL Non-GBR PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].
DL Total PRB Usage for MIMO	M		INTEGER (0100)	Per cell DL Total PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].
UL Total PRB usage for MIMO	M		INTEGER (0100)	Per cell UL Total PRB usage for MIMO in percentage of the cell total PRB number as defined in TS 38.314 [48].

9.3.1.206 MBS Session ID

This IE uniquely identifies the MBS Service.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TMGI	M		OCTET STRING (SIZE(6))	Encoded as defined in TS 23.003 [23].
NID	0		9.3.3.42	

9.3.1.207 MBS Area Session ID

This IE indicates the Area Session ID for MBS session with location dependent context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Area Session ID	M		INTEGER (065535,)	

9.3.1.208 MBS Service Area

This IE contains the MBS service area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Session Type	M			
>location independent				
>>MBS Service Area Information	М		9.3.1.209	
>location dependent				
>>MBS Service Area Information List		1		
>>>MBS Service Area Information Item		1 <maxnoofm BSServiceArea Information></maxnoofm 		
>>>>MBS Area Session ID	М		9.3.1.207	
>>>>MBS Service Area Information	М		9.3.1.209	

Range bound	Explanation
maxnoofMBSServiceAreaInformation	Maximum no. of MBS Service Area Information elements in the MBS
	Service Area Information Location Dependent List IE. Value is 256.

9.3.1.209 MBS Service Area information

This IE contains MBS service area information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Service Area Cell List		0 <maxnoofce llsforMBS></maxnoofce 		
>NR CGI	М		9.3.1.7	
MBS Service Area TAI List		0 <maxnoofta IforMBS></maxnoofta 		
>TAI	М		9.3.3.11	

Range bound	Explanation
maxnoofCellsforMBS	Maximum no. of cells allowed within one MBS Service Area. Value is 8192.
maxnoofTAlforMBS	Maximum no. of TAs allowed within one MBS Service Area. Value is 1024.

9.3.1.210 MBS Support Indicator

This IE indicates whether MBS is supported for the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Support Indicator	М		ENUMERATED (true,)	

9.3.1.211 MBS Session Setup Request List

This IE provides information related to MBS sessions joined by the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Setup Request List		1		
>MBS Session Setup Request Item		1 <maxnoofm BSSessions></maxnoofm 		
>>MBS Session ID	M		9.3.1.206	
>>MBS Area Session ID	0		9.3.1.207	
>>Associated MBS QoS Flow Setup Request List		01		
>>>Associated MBS QoS Flow Setup Request Item		1 <maxnoofm BSQoSflows></maxnoofm 		
>>>>MBS QoS Flow Identifier	М		QoS Flow Identifier 9.3.1.51	
>>>Associated Unicast QoS Flow Identifier	М		QoS Flow Identifier 9.3.1.51	

Range bound	Explanation
maxnoofMBSSessions	Maximum no. of MBS sessions allowed within one PDU session. Value is 32.
maxnoofMBSQoSflows	Maximum no. of MBS QoS flows allowed within one MBS session. Value is 64.

9.3.1.212 MBS Session Setup or Modify Request List

This IE provides information related to MBS sessions joined by the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Setup or Modify Request List		1		
>MBS Session Setup or Modify Request Item		1 <maxnoofm BSSessions></maxnoofm 		
>>MBS Session ID	M		9.3.1.206	
>>MBS Area Session ID	0		9.3.1.207	
>>Associated MBS QoS Flow Setup or Modify Request List		01		
>>>Associated MBS QoS Flow Setup or Modify Request Item		1 <maxnoofm BSQoSflows></maxnoofm 		
>>>>MBS QoS Flow Identifier	М		QoS Flow Identifier 9.3.1.51	
>>>>Associated Unicast QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.51	
>>MBS QoS Flow To Release List	0		QoS Flow List with Cause 9.3.1.13	This IE indicates the MBS QoS Flow Identifiers of the MBS QoS Flows to be released.

Range bound	Explanation
maxnoofMBSSessions	Maximum no. of MBS sessions allowed within one PDU session. Value is 32.
maxnoofMBSQoSflows	Maximum no. of MBS QoS flows allowed within one MBS session. Value is 64.

9.3.1.213 MBS Session Setup Response List

This IE contains a list of information related to MBS sessions.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
MBS Session Setup		1		
Response List				
>MBS Session Setup		1 <maxnoofm< td=""><td></td><td></td></maxnoofm<>		
Response Item		BSSessions>		
>>MBS Session ID	M		9.3.1.206	
>>MBS Area Session ID	0		9.3.1.207	

Range bound	Explanation
maxnoofMBSSessions	Maximum no. of MBS sessions allowed within one PDU session. Value is 32.

9.3.1.214 MBS Session Failed to Setup List

This IE contains a list of information related to MBS sessions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Failed to Setup List		1		
>MBS Session Failed to Setup Item		1 <maxnoofm BSSessions></maxnoofm 		
>>MBS Session ID	M		9.3.1.206	
>>MBS Area Session ID	0		9.3.1.207	
>>Cause	М		9.3.1.2	

Range bound	Explanation
maxnoofMBSSessions	Maximum no. of MBS Sessions allowed within one PDU session. Value is 32.

9.3.1.215 MBS Session To Release List

This IE indicates MBS sessions to be removed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session To Release List		1		
>MBS Session To Release Item		1 <maxnoofm BSSessions></maxnoofm 		
>>MBS Session ID	<u>M</u>		9.3.1.206	
>>Cause	М		9.3.1.2	

Range bound	Explanation
maxnoofMBSSessions	Maximum no. of MBS sessions allowed within one PDU session. Value is 32.

9.3.1.216 Multicast Group Paging Area

This IE contains a list of TAIs corresponding to the multicast group paging area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Area TAI List		1 <maxnoofta iforpaging=""></maxnoofta>		
>TAI	М		9.3.3.11	

Range bound	Explanation
maxnoofTAlforPaging	Maximum no. of TAIs for multicast group paging. Value is 16.

9.3.1.217 MBS Session Status

This IE indicates whether the MBS session is activated or deactivated.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Status	M		ENUMERATED	
			(activated,	
			deactivated,)	

9.3.1.218 MRB ID

This IE contains the MRB ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MRB ID	М		INTEGER (132,)	

9.3.1.219 MRB Progress Information

This IE contains the MRB progress information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE PDCP SN Status	M			
>12bits				
>>PDCP SN Length 12	M		INTEGER (04095)	
>18bits				
>>PDCP SN Length 18	M		INTEGER (0262143)	

9.3.1.220 Time Synchronisation Assistance Information

This IE indicates 5G access stratum time distribution parameters as defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Time Distribution Indication	М		ENUMERATED (enabled, disabled,)	
Uu Time Synchronisation Error Budget	C- ifEnabled		INTEGER (11000000,)	Expressed in units of 1ns.

Condition	Explanation
C-ifEnabled	This IE shall be present if the <i>Time Distribution Indication</i> IE is set to
	"enabled".

9.3.1.221 Survival Time

This IE indicates the Survival Time of the TSC QoS flow as defined in TS 23.501 [9].

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

9.3.1.222 QMC Deactivation

This IE indicates the QMC configurations to be deactivated.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoE Reference List		1 <maxnoofue AppLayerMeas ></maxnoofue 		
>QoE Reference	M		OCTET STRING (SIZE(6))	QoE Reference, as defined in clause 5.2 of TS 28.405 [45]. It consists of MCC+MNC+QMC ID, where the MCC and MNC are coming with the QMC activation request from the management system to identify one PLMN containing the management system, and QMC ID is a 3-bytes Octet String.

Range bound	Explanation
maxnoofUEAppLayerMeas	Maximum no. of UE application layer measurement. Value is 16.

9.3.1.223 QMC Configuration Information

This IE contains the configuration information for the QMC functionality.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Application Layer Measurement Information List		1		
>UE Application Layer Measurement Information Item		1 <maxnoofue AppLayerMeas ></maxnoofue 		
>>UE Application Layer Measurement Configuration Information	М		9.3.1.224	

Range bound	Explanation
maxnoofUEAppLayerMeas	Maximum no. of UE application layer measurements. Value is 16.

9.3.1.224 UE Application Layer Measurement Configuration Information

This IE defines configuration information for the QMC functionality.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoE Reference	M		OCTET STRING (SIZE(6))	QoE Reference, as defined in clause 5.2 of TS 28.405 [45]. It consists of MCC+MNC+QMC ID, where the MCC and MNC are coming with the QMC activation request from the management system to identify one PLMN containing the management system, and QMC ID is a 3-bytes Octet String.
Service Type	M		ENUMERATED (QMC for DASH streaming, QMC for MTSI, QMC for VR,)	This IE indicates the service type of QoE measurements.
CHOICE Area Scope of QMC	M			
>Cell based >>Cell ID List for QMC		4		
>>Cell ID LIST TOT QIMIC		1 <maxnoofce iiidforqmc=""></maxnoofce>		
>>>NG-RAN CGI	М		9.3.1.73	This IE can only indicate the NR CGI.
>TA based				
>>TA List for QMC		1 <maxnoofta forQMC></maxnoofta 		
>>>TAC	М		9.3.3.10	The TAI is derived using the current serving PLMN.
>TAI based				
>>TAI List for QMC		1 <maxnoofta forQMC></maxnoofta 		
>>>TAI	М		9.3.3.11	
>PLMN area based				
>>PLMN List for QMC		1 <maxnoofpl MNforQMC></maxnoofpl 		
>>>PLMN Identity	М		9.3.3.5	
Measurement Collection Entity IP Address	М		Transport Layer Address 9.3.2.4	The IP address of the entity receiving the QoE measurement report.
QoE Measurement Status	0		ENUMERATED (ongoing,)	Indicates whether the QoE measurement has been started. Present in case of NG-based handover.
Container for Application Layer Measurement Configuration	0		OCTET STRING (SIZE(1 8000))	Contains application layer measurement configuration, see Annex L in 26.247 [46], clause 16.5 in TS 26.114 [51] and clause 9 in TS 26.118 [52]. Present in case of initial QoE configuration, and shall be included in Source to Target Transparent Container IE for signalling-based QMC during NG-based handover.
Measurement Configuration Application Layer ID	0		INTEGER (015,)	This IE is present only when the message containing it is NG-based handover related. The IE indicates the identity of the application layer measurement configuration, as defined in TS 38.331 [18].
Slice Support List for QMC		01		L - 3
>Slice Support QMC Item		1 <maxnoofsn SSAIforQMC></maxnoofsn 		
>>S-NSSAI	M		9.3.1.24	

CHOICE MDT Alignment Information	0		Indicates the MDT measurements with which alignment is required.
>S-based MDT			
>>NG-RAN Trace ID	M	OCTET STF (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [11] (leftmost 6 octets, with PLMN information encoded as in 9.3.3.5), and Trace Recording Session Reference defined in TS 32.422 [11] (last 2 octets).
Available RAN Visible QoE Metrics	0	9.3.1.225	Present in case of initial QoE configuration and in case of NG-based handover for signalling-based QoE measurement.

Range bound	Explanation
maxnoofCellIDforQMC	Maximum no. of Cell ID subject for QMC scope. Value is 32.
maxnoofTAforQMC	Maximum no. of TA subject for QMC scope. Value is 8.
maxnoofPLMNforQMC	Maximum no. of PLMNs in the PLMN list for QMC scope. Value is 16.
maxnoofSNSSAlforQMC	Maximum no. of S-NSSAIs in the S-NSSAI list for QMC scope. Value is 16.

9.3.1.225 Available RAN Visible QoE Metrics

This IE defines which RAN visible QoE metrics can be configured by the NG-RAN in the RAN visible QoE measurement.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Application Layer Buffer Level List	0		ENUMERATED (true,)	The IE defines whether the Buffer Level can be collected as a RAN visible QoE metric by NG-RAN from UE, for DASH streaming and VR service types.
Playout Delay for Media Startup	0		ENUMERATED (true,)	The IE defines whether the Playout delay can be collected as a RAN visible QoE metric by NG-RAN from UE, for DASH streaming and VR service types.

9.3.1.226 Void

9.3.1.227 NR Paging eDRX Information

This IE indicates the NR Paging eDRX parameters as defined in TS 38.304 [12].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR Paging eDRX Cycle	M		ENUMERATED (hfquarter, hfhalf, hf1, hf2, hf4, hf8, hf16, hf32, hf64, hf128, hf256, hf512, hf1024,)	Tedra cn defined in TS 38.304 [12]. Unit: [number of hyperframes].
NR Paging Time Window	0		ENUMERATED (s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16,)	PTW defined in TS 38.304 [12]. Unit: [1.28 seconds]

9.3.1.228 RedCap Indication

This IE is provided by the NG-RAN node to inform that the UE indicates Reduced Capability.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RedCap Indication	М		ENUMERATED (RedCap,)	

9.3.1.229 Target NSSAI Information

This IE contains the Target NSSAI and Index to RAT/Frequency Selection Priority as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
			reference	
Target NSSAI	M		9.3.1.230	
Index to RAT/Frequency Selection Priority	M		9.3.1.61	

9.3.1.230 Target NSSAI

This IE contains the Target NSSAI as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target S-NSSAI List		1		
>Target S-NSSAI Item		1 <maxnoofta rgetS-NSSAls></maxnoofta 		
>>S-NSSAI	М		9.3.1.24	

Range bound	Explanation
maxnoofTargetS-NSSAIs	Maximum no. of Target S-NSSAIs. Value is 8.

9.3.1.231 UE Slice Maximum Bit Rate List

This IE contains the UE Slice Maximum Bit Rate List as specified in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Slice Maximum Bit Rate Item		1 <maxnoof alloweds-="" nssais=""></maxnoof>		Applicable across all GBR and Non-GBR QoS flows.
>S-NSSAI	M		9.3.1.24	
>UE Slice Maximum Bit Rate Downlink	М		Bit Rate 9.3.1.4	This IE indicates the downlink UE-Slice-MBR as specified in TS 23.501 [9].
>UE Slice Maximum Bit Rate Uplink	М		Bit Rate 9.3.1.4	This IE indicates the uplink UE- Slice-MBR as specified in TS 23.501 [9].

Range bound	Explanation
maxnoofAllowedS-NSSAIs	Maximum no. of allowed S-NSSAI. Value is 8.

9.3.1.232 PEIPS Assistance Information

This IE provides the information related to CN paging subgrouping for a particular UE, as specified in TS 38.304 [12].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CN Subgroup ID	M		INTEGER (07,)	

9.3.1.233 5G ProSe Authorized

This IE provides information on the authorization status of the UE to use the 5G ProSe services.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
5G ProSe Direct Discovery	0		ENUMERATED	Indicates whether the UE is
			(authorized, not	authorized for 5G ProSe Direct
			authorized,)	Discovery
5G ProSe Direct	0		ENUMERATED	Indicates whether the UE is
Communication			(authorized, not	authorized for 5G ProSe Direct
			authorized,)	Communication
5G ProSe Layer-2 UE-to-	0		ENUMERATED	Indicates whether the UE is
Network Relay			(authorized, not	authorized for 5G ProSe Layer-2
			authorized,)	UE-to-Network Relay
5G ProSe Layer-3 UE-to-	0		ENUMERATED	Indicates whether the UE is
Network Relay			(authorized, not	authorized for 5G ProSe Layer-3
			authorized,)	UE-to-Network Relay
5G ProSe Layer-2 Remote	0	•	ENUMERATED	Indicates whether the UE is
UE			(authorized, not	authorized for 5G ProSe Layer-2
			authorized,)	Remote UE

9.3.1.234 5G ProSe PC5 QoS Parameters

This IE provides information on the 5G ProSe PC5 QoS parameters of the UE's sidelink communication for 5G ProSe services.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
5G ProSe PC5 QoS Flow List		1		
>5G ProSe PC5 QoS Flow Item		1 <maxnoofpc 5QoSFlows></maxnoofpc 		
>>PQI	М		INTEGER (0255,)	PQI is a special 5QI as specified in TS 23.501 [9].
>>5G ProSe PC5 Flow Bit Rates		01		Only applies for GBR QoS flows.
>>>Guaranteed Flow Bit Rate	M		Bit Rate 9.3.1.4	Guaranteed Bit Rate for the PC5 QoS flow. Details in TS 23.501 [9].
>>>Maximum Flow Bit Rate	M		Bit Rate 9.3.1.4	Maximum Bit Rate for the PC5 QoS flow. Details in TS 23.501 [9].
>>Range	0		ENUMERATED (m50, m80, m180, m200, m350, m400, m500, m700, m1000,)	Only applies for groupcast.
5G ProSe PC5 Link Aggregate Bit Rates	0		Bit Rate 9.3.1.4	Only applies for Non-GBR QoS flows.

Range bound	Explanation
maxnoofPC5QoSFlows	Maximum no. of PC5 QoS flows allowed towards one UE. Value is 2048.

9.3.1.235 Last Visited PSCell Information

The Last Visited PSCell Information may contain cell specific information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PSCell ID	0		NG-RAN CGI 9.3.1.73	This IE is present when the SCG resources are configured for the UE.
Time Stay	M		INTEGER (040950)	The duration of the time the UE stayed in the cell in 1/10 seconds. If the UE stays in a cell more than 4095s, this IE is set to 40950. Or the duration of the time when no SCG resources are configured for the UE.

9.3.1.236 MBS QoS Flows To Be Setup List

This IE contains a list of QoS flows and their associated QoS parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS QoS Flows Setup		1 <maxnoofm< td=""><td></td><td></td></maxnoofm<>		
Request Item		BSQoSFlows>		
>MBS QoS Flow Identifier	М		QoS Flow Identifier	
			9.3.1.51	
>MBS QoS Flow Level QoS	М		QoS Flow Level	
Parameters			QoS Parameters	
			9.3.1.12	

Range bound	Explanation
maxnoofMBSQoSflows	Maximum no. of MBS QoS flows allowed within one MBS session. Value is 64.

9.3.1.237 Reporting System

This IE lists the cells on the reporting system.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Reporting System				
>E-UTRAN				
>>E-UTRAN Cell To		1		
Report List				
>>>E-UTRAN Cell To		1 <maxnoofre< td=""><td></td><td></td></maxnoofre<>		
Report Item		portedCells>		
>>>>Cell ID	M		E-UTRA CGI	
			9.3.1.9	
>NG-RAN				
>>NG-RAN Cell To		1		
Report List				
>>>NG-RAN Cell To		1 <maxnoofre< td=""><td></td><td></td></maxnoofre<>		
Report Item		portedCells>		
>>>>Cell ID	M		NG-RAN CGI	
			9.3.1.73	
>No Reporting			NULL	Resource status not available.

Range bound	Explanation
maxnoofReportedCells	Maximum no. of cells that can be reported. Value is 256.

9.3.1.238 TAI NSAG Support List

This IE contains the slice group mapping for all groups configured at the NG-RAN node per TAI.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
TAI NSAG Support Item		1 <maxnoofns< td=""><td></td><td></td></maxnoofns<>		
		AGs>		
>NSAG ID	M		INTEGER (0255,	
)	
>NSAG Slice Support List	М		Extended Slice	Indicates the list of slices which
1			Support List	belong to the NSAG.
			9.3.1.191	-

Range bound	Explanation
maxnoofNSAGs	Maximum no. of Slice Groups for the TAI. Value is 256.

9.3.1.239 NGAP Protocol IE-Id

This IE uniquely identifies an NGAP Protocol IE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NGAP Protocol IE-Id	M		INTEGER (065535)	

9.3.1.240 NGAP Protocol IE Support Information

This IE provides information about support of functions associated to an NGAP Protocol IE-Id.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NGAP Protocol IE Support	M		ENUMERATED	
Information			(supported, not-	
			supported,)	

9.3.1.241 NGAP Protocol IE Presence Information

This IE provides information on whether an NGAP Protocol IE-Id was received within the message requesting the information (i.e. HANDOVER REQUEST).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NGAP Protocol IE	М		ENUMERATED	
Presence Information			(present, not present)	

9.3.1.242 NGAP IE Support Information Response List

This IE provides information about support of functions associated to a list of NGAP Protocol IE-Ids.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NGAP IE Support		1 <maxno< td=""><td></td><td></td></maxno<>		
Information Response		ofIESuppo		
Item		rtInfo>		
>NGAP Protocol IE-Id	М		9.3.1.239	
>NGAP Protocol IE	М		9.3.1.240	
Support Information				
>NGAP Protocol IE	М		9.3.1.241	
Presence Information				

Range bound	Explanation
maxnoofIESupportInfo	Maximum no. of IE Support Information. Value is 32.

9.3.1.243 MDT PLMN Modification List

This IE provides the modified list of PLMN allowed for MDT.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT PLMN Modification		0 <maxnoofm< td=""><td></td><td>An empty list indicates there is</td></maxnoofm<>		An empty list indicates there is
List		DTPLMNs>		no PLMN allowed for MDT.
>PLMN Identity	M		9.3.3.5	

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

9.3.2 Transport Network Layer Related IEs

9.3.2.1 QoS Flow per TNL Information List

This IE is used to provide a list of additional UP transport layer information for a split PDU session, along with the associated QoS flows.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow per TNL Information Item		1 <maxnoofm ultiConnectivity MinusOne></maxnoofm 	10.0.0.00	
>QoS Flow per TNL Information	М		9.3.2.8	

Range bound	Explanation		
maxnoofMultiConnectivityMinusOne	Maximum no. of connectivity allowed for a UE minus one. Value is 3. The		
	current version of the specification supports 1.		

9.3.2.2 UP Transport Layer Information

This IE is used to provide the NG user plane transport layer information associated with a PDU session for an NG-RAN node – UPF pair. In this release it corresponds to an IP address and a GTP Tunnel Endpoint Identifier.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE UP Transport	M			
Layer Information				
>GTP tunnel				
>>Endpoint IP Address	M		Transport Layer Address 9.3.2.4	
>>GTP-TEID	М		9.3.2.5	

9.3.2.3 E-RAB ID

This IE is the identifier of the LTE E-RAB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
E-RAB ID	М		INTEGER (015,)	

9.3.2.4 Transport Layer Address

This IE is an IP address.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transport Layer Address	M		BIT STRING (SIZE(1160,))	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 [14].

9.3.2.5 GTP-TEID

This IE is the GTP Tunnel Endpoint Identifier to be used for the user plane transport between the NG-RAN node and the UPF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
GTP-TEID	М		OCTET STRING (SIZE(4))	For details and range, see TS 29.281 [15].

9.3.2.6 CP Transport Layer Information

This IE is used to provide the NG control plane transport layer information associated with an NG-RAN node – AMF pair.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE CP Transport Layer Information						
>Endpoint-IP-address					-	
>>Endpoint IP Address	M		Transport Layer Address 9.3.2.4		-	
>Endpoint-IP-address- and-port					YES	reject
>>Endpoint IP Address	M		Transport Layer Address 9.3.2.4		-	
>>Port Number	М		OCTET STRING (SIZE(2))		-	

9.3.2.7 TNL Association List

This IE contains a list of TNL associations. It is used for example to indicate failed TNL association(s).

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
TNL Association Item		1 <maxnooft< th=""><th></th><th></th></maxnooft<>		
		NLAssociation		
		<i>s></i>		
>TNL Association Address	M		CP Transport Layer	
			Information	
			9.3.2.6	
>Cause	М		9.3.1.2	

Range bound	Explanation
maxnoofTNLAssociations	Maximum no. of TNL Associations between the NG-RAN node and the
	AMF. Value is 32.

9.3.2.8 QoS Flow per TNL Information

This IE indicates the NG-U transport layer information and associated list of QoS flows.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UP Transport Layer Information	М		9.3.2.2	
Associated QoS Flow List	M		9.3.1.99	

9.3.2.9 TNL Association Usage

This IE indicates the usage of the TNL association.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TNL Association Usage	0		ENUMERATED (ue, non-ue, both,)	Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both.

9.3.2.10 TNL Address Weight Factor

This IE indicates the weight factor of the TNL address.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TNL Address Weight Factor	М		INTEGER (0255)	Value 0 indicates the TNL address is not permitted for the initial NGAP message. If the value for each TNL address is the same, it indicates the deployments that rely solely on 5GC-based load balancing.

9.3.2.11 UP Transport Layer Information Pair List

This IE is used to provide a list of uplink UP transport layer information and associated downlink UP transport layer information for a split PDU session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UP Transport Layer Information Pair Item		1 <maxnoofm ultiConnectivity MinusOne></maxnoofm 		
>UL NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2	
>DL NG-U UP TNL Information	М		UP Transport Layer Information 9.3.2.2	

Range bound	Explanation
maxnoofMultiConnectivityMinusOne	Maximum no. of connectivity allowed for a UE minus one. Value is 3. The
	current version of the specification supports 1.

9.3.2.12 UP Transport Layer Information List

This IE is used to provide a list of additional UP transport layer information for a split PDU session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UP Transport Layer Information Item		1 <maxno ofMultiCon nectivityMi nusOne></maxno 			-	
>NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2		-	
>Common Network Instance	0		9.3.1.120		YES	ignore

Range bound	Explanation
maxnoofMultiConnectivityMinusOne	Maximum no. of connectivity allowed for a UE minus one. Value is 3. The
	current version of the specification supports 1.

9.3.2.13 QoS Flow List with Data Forwarding

This IE is used to provide a list of QoS flows with indication if forwarding is accepted.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow Item with Data Forwarding		1 <maxno ofQoSFlo ws></maxno 			-	
>QoS Flow Identifier	M		9.3.1.51		-	
>Data Forwarding Accepted	0		9.3.1.62	This IE is included for the QoS flows in the PDU session to be forwarded over the PDU session forwarding tunnel. It may be included for the QoS flows in the PDU session to be forwarded over the DRB forwarding tunnel(s).	-	
>Current QoS Parameters Set Index	0		Alternative QoS Parameters Set Index 9.3.1.152	Index to the currently fulfilled alternative QoS parameters set	YES	ignore

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

9.3.2.14 URI

This IE is an URI.

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

9.3.2.15 MBS Session TNL Information 5GC

This IE provides 5GC TNL information for location dependent and location independent broadcast MBS sessions.

IE/Group Name	/Group Name Presence Range		IE type and reference	Semantics description
CHOICE Session Type	M			
>location independent				
>>Shared NG-U Multicast TNL Information	М		9.3.2.16	
>location dependent				
>>MBS Session TNL Information 5GC List		1		
>>>MBS Session TNL Information 5GC Item		1 <maxnoofm BSServiceArea Information></maxnoofm 		
>>>>MBS Area Session ID	М		9.3.1.207	
>>>>Shared NG-U Multicast TNL Information	М		9.3.2.16	

Range bound	Explanation
maxnoofMBSServiceAreaInformation	Maximum no. of MBS Service Area Information. Value is 256.

9.3.2.16 Shared NG-U Multicast TNL Information

This IE provides the shared NG user plane transport layer information associated with an MBS session at the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IP Multicast Address	M		Transport Layer	
			Address	
			9.3.2.4	
IP Source Address	M		Transport Layer	
			Address	
			9.3.2.4	
GTP-TEID at 5GC	M		GTP-TEID	
			9.3.2.5	

9.3.2.17 MBS Session TNL Information NG-RAN

This IE provides NG-RAN TNL information for location dependent and location independent broadcast MBS sessions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Session Type	M			
>location independent				
>Shared NG-U Unicast TNL Information	М		UP Transport Layer Information 9.3.2.2	
>location dependent				
>>MBS Session TNL Information NG-RAN List		1		
>>>MBS Session TNL Information NG-RAN Item		1 <maxnoofm BSServiceArea Information></maxnoofm 		
>>>>MBS Area Session ID	М		9.3.1.207	
>>>>Shared NG-U Unicast TNL Information	0		UP Transport Layer Information 9.3.2.2	

Range bound	Explanation
maxnoofMBSServiceAreaInformation	Maximum no. of MBS Service Area Information. Value is 256.

9.3.3 NAS Related IEs

9.3.3.1 AMF UE NGAP ID

This IE uniquely identifies the UE association over the NG interface, as described in TS 38.401 [2].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF UE NGAP ID	M		INTEGER (02 ⁴⁰ -1)	

9.3.3.2 RAN UE NGAP ID

This IE uniquely identifies the UE association over the NG interface within the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAN UE NGAP ID	M		INTEGER (02 ³² -1)	

9.3.3.3 GUAMI

This IE indicates the AMF identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
AMF Region ID	М		BIT STRING (SIZE(8))	
AMF Set ID	M		9.3.3.12	
AMF Pointer	M		9.3.3.19	

9.3.3.4 NAS-PDU

This IE contains a 5GC – UE or UE – 5GC message that is transferred without interpretation in the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NAS-PDU	М		OCTET STRING	The content is defined in TS 24.501 [26].

9.3.3.5 PLMN Identity

This IE indicates the PLMN Identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		OCTET STRING (SIZE(3))	Digits 0 to 9 encoded 0000 to 1001, 1111 used as filler digit.
				Two digits per octet: - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n
				PLMN Identity consists of 3 digits from MCC followed by either: - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of 3 digit MNC).

9.3.3.6 SON Configuration Transfer

This IE contains the configuration information, used by e.g., SON functionality, and additionally includes the NG-RAN node identifier of the destination of this configuration information and the NG-RAN node identifier of the source of this information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Target RAN Node ID	М			•		,
>Global RAN Node ID	М		9.3.1.5			
>Selected TAI	М		TAI			
			9.3.3.11			
>NG-RAN CGI	0		9.3.1.73	This IE is ignored if the SON Information IE contains the SON Information Reply IE.	YES	ignore
Source RAN Node ID	M					
>Global RAN Node ID	M		9.3.1.5			
>Selected TAI	M		TAI			
			9.3.3.11			
SON Information	M		9.3.3.7			
Xn TNL Configuration Info	C- ifSONInfo rmationR equest		9.3.3.9	Source NG-RAN node Xn TNL Configuration Info.		

Condition	Explanation		
ifSONInformationRequest	This IE shall be present if the SON Information IE contains the SON		
	Information Request IE set to "Xn TNL Configuration Info"		

9.3.3.7 SON Information

This IE identifies the nature of the configuration information transferred, i.e., a request, a reply or a report.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE SON Information	M				-	
>SON Information Request						
>>SON Information Request	M		ENUMERATED (Xn TNL Configuration Info,)		-	
>SON Information Reply						
>>SON Information Reply	M		9.3.3.8		-	
>SON Information Report						
>>SON Information Report	M		9.3.3.35		YES	ignore

9.3.3.8 SON Information Reply

This IE contains the configuration information to be replied to the NG-RAN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Xn TNL Configuration Info	0		9.3.3.9	

9.3.3.9 Xn TNL Configuration Info

This IE is used for signalling Xn TNL Configuration information for automatic Xn SCTP association establishment.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Xn Transport Layer Addresses		1 <maxno ofXnTLAs ></maxno 			-	
>Transport Layer Address	М		9.3.2.4	Transport Layer Addresses for Xn SCTP endpoint.	-	
Xn Extended Transport Layer Addresses		0 <maxno ofXnExtTL As></maxno 			-	
>IP-Sec Transport Layer Address	0		Transport Layer Address 9.3.2.4	Transport Layer Addresses for IP- Sec endpoint.	-	
>Xn GTP Transport Layer Addresses		0 <maxno ofXnGTP- TLAs></maxno 			-	
>>GTP Transport Layer Address	М		Transport Layer Address 9.3.2.4	GTP Transport Layer Addresses for GTP end-points (used for data forwarding over Xn).	-	
>Xn SCTP Transport Layer Addresses		0 <maxno ofXnTLAs ></maxno 		,	YES	ignore
>>Transport Layer Address SCTP	M		Transport Layer Address 9.3.2.4	Transport Layer Addresses for Xn SCTP endpoint.	-	

Range bound	Explanation
maxnoofXnTLAs	Maximum no. of Xn Transport Layer Addresses for an SCTP end-point. Value is
	2.
maxnoofXnExtTLAs	Maximum no. of Xn Extended Transport Layer Addresses in the message.
	Value is 16.
maxnoofXnGTP-TLAs	Maximum no. of Xn GTP Transport Layer Addresses for a GTP end-point in the
	message. Value is 16.

9.3.3.10 TAC

This IE is used to uniquely identify a Tracking Area Code.

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

9.3.3.11 TAI

This IE is used to uniquely identify a Tracking Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.3.5	
TAC	M		9.3.3.10	

9.3.3.12 AMF Set ID

This IE is used to uniquely identify an AMF Set within the AMF Region.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF Set ID	M		BIT STRING	
			(SIZE(10))	

9.3.3.13 Routing ID

This IE is used to identify an LMF within the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Routing ID	М		OCTET STRING	The maximum length corresponds to NfInstanceld defined in TS 29.571 [35]

9.3.3.14 NRPPa-PDU

This IE contains an NG-RAN node – LMF or LMF – NG-RAN node message that is transferred without interpretation in the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NRPPa-PDU	M		OCTET STRING	

9.3.3.15 RAN Paging Priority

This IE contains the service priority as defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAN Paging Priority	M		INTEGER (1256)	Values ordered in decreasing order of priority, i.e. with 1 as the highest priority and 256 as the lowest priority

9.3.3.16 EPS TAC

This IE is used to uniquely identify an EPS Tracking Area Code.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
EPS TAC	M		OCTET STRING (SIZE(2))	

9.3.3.17 EPS TAI

This IE is used to uniquely identify an EPS Tracking Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	М		9.3.3.5	
EPS TAC	М		9.3.3.16	

9.3.3.18 UE Paging Identity

This IE represents the Identity with which the UE is paged.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE UE Paging Identity	M			
>5G-S-TMSI				
>>5G-S-TMSI	M		9.3.3.20	

9.3.3.19 AMF Pointer

This IE is used to identify one or more AMF(s) within the AMF Set.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF Pointer	М		BIT STRING (SIZE(6))	

9.3.3.20 5G-S-TMSI

This IE is used for security reasons, to hide the identity of a subscriber.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF Set ID	M		9.3.3.12	
AMF Pointer	M		9.3.3.19	
5G-TMSI	M		OCTET STRING	5G-TMSI is unique within the
			(SIZE(4))	AMF that allocated it.

9.3.3.21 AMF Name

This IE is used to uniquely identify the AMF (see TS 38.300 [8]). It may also be used as a human readable name of the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF Name	M		PrintableString (SIZE(1150,))	

9.3.3.22 Paging Origin

This IE indicates whether Paging is originated due to the PDU sessions from the non-3GPP access.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging Origin	М		ENUMERATED (non-3GPP,)	

9.3.3.23 UE Identity Index Value

This IE is used by the NG-RAN node to calculate the Paging Frame as specified in TS 38.304 [12] and TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE UE Identity Index Value				
>Index Length 10				
>>Index Length 10	М		BIT STRING (SIZE(10))	Coded as specified in TS 38.304 [12] and TS 36.304 [29].

9.3.3.24 Periodic Registration Update Timer

This IE is used to assist NG-RAN to generate corresponding timer for periodic RNA update for RRC_INACTIVE UEs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Periodic Registration Update Timer	M		BIT STRING (SIZE(8))	Bits 5 to 1 represent the binary coded timer value.
				Bits 6 to 8 define the timer value unit for the Periodic Registration Update Timer as follows:
				Bits 8 7 6 0 0 0 value is incremented in multiples of 10 minutes 0 0 1 value is incremented in multiples of 1 hour 0 1 0 value is incremented in multiples of 10 hours 0 1 1 value is incremented in multiples of 2 seconds 1 0 0 value is incremented in multiples of 30 seconds 1 0 1 value is incremented in multiples of 1 minute 1 1 1 value indicates that the timer is deactivated.
				1 1 0 value is incremented in multiples of 1 hour in this version of the protocol.

9.3.3.25 UE-associated Logical NG-connection List

This IE contains a list of UE-associated logical NG-connections.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE-associated Logical NG-connection Item		1 <maxnoofn GConnections ToReset></maxnoofn 		
>AMF UE NGAP ID	0		9.3.3.1	
>RAN UE NGAP ID	0		9.3.3.2	

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

9.3.3.26 NAS Security Parameters from NG-RAN

This IE provides security related parameters for inter-system handover from NG-RAN to E-UTRAN or from NG-RAN to UTRAN via the eNB to the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NAS Security Parameters from NG-RAN	М		OCTET STRING	Refers to the N1 mode to S1 mode NAS transparent container IE, the details of the IE definition and the encoding are specified in TS 24.501 [26].

9.3.3.27 Source to Target AMF Information Reroute

This IE is used to transparently pass information provided by NSSF from the source AMF to the target AMF through the NG-RAN node; it is produced by the source core network node and is transmitted to the target core network node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Configured NSSAI	0		OCTET STRING (SIZE(128))	The maximum number of S-NSSAI in Configured NSSAI is 16. This IE contains optional mapping S-NSSAI. When present, this IE shall be transmitted transparent from the source Core network node to the target Core network node. The octets of the OCTET STRING are encoded according to description in TS 29.531 [30]
Rejected NSSAI in PLMN	0		OCTET STRING (SIZE(32))	This IE contain the rejected NSSAI(s) in the PLMN. When present, this IE shall be transmitted transparent from the source Core network node to the target Core network node. The octets of the OCTET STRING are encoded according to description in TS 29.531 [30].
Rejected NSSAI in TA	0		OCTET STRING (SIZE(32))	This IE contain the rejected NSSAI(s) in the TA. When present, this IE shall be transmitted transparent from the source Core network node to the target Core network node. The octets of the OCTET STRING are encoded according to description in TS 29.531 [30].

9.3.3.28 RIM Information Transfer

This IE contains information used by the RIM functionality, and additionally includes the NG-RAN node identifier of the destination of the RIM information and the NG-RAN node identifier of the source of this information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target RAN Node ID	M			
>Global RAN Node ID	M		9.3.1.5	
>Selected TAI	М		TAI 9.3.3.11	
Source RAN Node ID	M			
>Global RAN Node ID	М		9.3.1.5	
>Selected TAI	M		TAI	
			9.3.3.11	
RIM Information	М		9.3.3.29	

9.3.3.29 RIM Information

This IE contains the RIM information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target gNB Set ID	M		gNB Set ID 9.3.1.122	The victim gNB Set ID.
RIM-RS Detection	M		ENUMERATED (RS detected, RS disappeared,)	

9.3.3.30 LAI

This IE is used to uniquely identify a Location Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LAI				
>PLMN Identity	M		9.3.3.5	
>LAC	M		OCTET STRING	0000 and FFFE not allowed.
			(SIZE(2))	

9.3.3.31 Extended Connected Time

This IE indicates the minimum time the RAN should keep the UE in RRC_CONNECTED state regardless of inactivity, as defined in TS 23.501 [9].

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
Extended Connected Time	M		INTEGER (0255)	Minimum time the RAN should keep the UE in RRC_CONNECTED state. Unit is second. Value of "0" indicates that the AMF is aware of pending data traffic, but no specific time value is requested.

9.3.3.32 End Indication

This IE indicates that there are no further NAS PDUs to be transmitted for this UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
End Indication	M		ENUMERATED (no further data, further data exists,	
			further data exists,)	

9.3.3.33 Inter-system SON Configuration Transfer

This IE contains the configuration information, used by e.g., SON functionality, transmitted between an NG-RAN node and an eNB and additionally includes the node identifier of the destination of this configuration information and the node identifier of the source of this information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Transfer Type	М			
>from E-UTRAN to NG- RAN				
>>Source eNB-ID		1		
>>>Global eNB ID	M		9.3.1.165	
>>>Selected EPS TAI	М		EPS TAI 9.3.3.17	
>>Target NG-RAN node ID		1		
>>>Global RAN Node ID	M		9.3.1.5	
>>>Selected TAI	М		TAI 9.3.3.11	
>from NG-RAN to E- UTRAN				
>>Source NG-RAN Node ID		1		
>>>Global RAN Node ID	M		9.3.1.5	
>>>Selected TAI	М		TAI 9.3.3.11	
>>Target eNB-ID		1		
>>>Global eNB ID	M		9.3.1.165	
>>>Selected EPS TAI	М		EPS TAI 9.3.3.17	
Inter-system SON Information	М		9.3.3.34	

9.3.3.34 Inter-system SON Information

This IE identifies the nature of the configuration information transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE Inter-system	M				-	
SON Information						
>Inter-system SON						
Information Report						
>>Inter-system SON	M		9.3.3.36		-	
Information Report						
>Inter-system SON						
Information Request						
>>Inter-system SON	M		9.3.3.54		YES	ignore
Information Request						
>Inter-system SON						
Information Reply						
>>Inter-system SON	M		9.3.3.55		YES	ignore
Information Reply						

9.3.3.35 SON Information Report

This IE contains the configuration information to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE SON	М				-	
Information Report						
>Failure Indication						
Information						
>>Failure Indication	M		9.3.3.37		-	
>HO Report Information						
>>HO Report	M		9.3.3.39		-	
>Successful HO Report						
Information						
>>Successful HO		1			YES	ignore
Report List						
>>>Successful HO		1 <maxno< td=""><td></td><td></td><td>-</td><td></td></maxno<>			-	
Report Item		ofSuccess				
		fulHORep				
		orts>				
>>>Successful HO	M		OCTET STRING	SuccessHO-	-	
Report Container				Report-r17 IE as		
				defined in TS		
				38.331 [18].		

Range bound	Explanation
maxnoofSuccessfulHOReports	Maximum no. of Successful HO Reports. Value is 64.

9.3.3.36 Inter-system SON Information Report

This IE contains the configuration information to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE SON	M			-	-	
Information Report						
>HO Report Information						
>>Inter-system HO Report	М		9.3.3.40		-	
>Failure Indication Information						
>>Inter-system Failure Indication	М		9.3.3.38		-	
>Energy Savings Indication						
>>Inter-system Cell State Indication	М		9.3.3.57		YES	ignore
>Resource Status Report						
>>Inter-system Resource Status Report	M		9.3.3.60		YES	ignore

9.3.3.37 Failure Indication

This IE contains the failure indication to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE RLF Report Container	0		9.3.3.41	

9.3.3.38 Inter-system Failure Indication

This IE contains the failure indication to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE RLF Report Container	0		9.3.3.41	Only contains the LTE RLF report in this version of the specification.

9.3.3.39 HO Report

This IE contains the HO report to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Handover Report Type	M		ENUMERATED (HO too early, HO to wrong cell, Intersystem ping-pong,)	
Handover Cause	M		Cause 9.3.1.2	Indicates handover cause employed for handover from source cell
Source Cell CGI	М		NG-RAN CGI 9.3.1.73	NG-RAN CGI of the source cell for handover procedure
Target Cell CGI	М		NG-RAN CGI 9.3.1.73	NG-RAN CGI of the target cell for handover procedure. If the Handover Report Type is set to "Inter-system ping-pong", it contains the target cell of the inter system handover from the other system to NG-RAN node cell
Re-establishment Cell CGI	C- ifHandov erReport Type HoToWro ngCell		NG-RAN CGI 9.3.1.73	NG-RAN CGI of the cell where UE attempted re-establishment or where the UE successfully re- connected after the failure
Source Cell C-RNTI	0		BIT STRING (SIZE (16))	C-RNTI allocated at the source NG-RAN node
Target Cell in E-UTRAN	C- ifHandov erReport Type Intersyste mpingpon g		E-UTRA CGI 9.3.1.9	E-UTRA CGI of the E-UTRAN target cell for handover procedure
Mobility Information	Ö		BIT STRING (SIZE (32))	Information provided in the HANDOVER REQUEST message from the source NG-RAN node
UE RLF Report Container	0		9.3.3.41	The UE RLF Report Container IE received in the FAILURE INDICATION message.

Condition	Explanation
ifHandoverReportTypeHoToWrongCell	This IE shall be present if the Handover Report Type IE is set to the
	value "HO to wrong cell"
ifHandoverReportTypeIntersystempingpong	This IE shall be present if the Handover Report Type IE is set to the
	value "Inter-system ping-pong"

9.3.3.40 Inter-system HO Report

This IE contains the inter-system HO report to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Handover Report Type	М			
>Too early Inter-system HO				
>>Source Cell ID	М		E-UTRA CGI 9.3.1.9	CGI of the source cell for the HO.
>>Failure Cell ID	М		NG-RAN CGI 9.3.1.73	CGI of the target cell for the HO.
>>UE RLF Report Container	0		9.3.3.41	
>Inter-system Unnecessary HO				
>>Source Cell CGI	М		NG-RAN CGI 9.3.1.73	Source NR cell in NG-RAN
>>Target Cell CGI	М		E-UTRA CGI 9.3.1.9	Target cell in E-UTRAN
>>Early IRAT HO	М		ENUMERATED (true, false,)	Is set to "true" if the measurement period expired due to an inter-RAT handover towards NR executed within the configured measurement duration and otherwise set to "false"
>>Candidate Cell List		1		
>>>Candidate Cell Item		1 <maxnoofca ndidateCells></maxnoofca 		
>>>>CHOICE Candidate Cell Type	М			
>>>>Candidate CGI				
>>>>>Candidate Cell	М		NR CGI 9.3.1.7	This IE contains an NR CGI.
>>>> Candidate PCI				
>>>>>Candidate PCI	М		INTEGER (01007,)	This IE includes the NR Physical Cell Identifier of detected cells not included in the <i>Candidate Cell List</i> IE and for which an NR CGI could not be derived.
>>>>>Candidate NR ARFCN	M		INTEGER (0 maxNARFCN)	RF Reference Frequency as defined in TS 38.104 [39], section 5.4.2.1. The frequency provided in this IE identifies the absolute frequency position of the reference resource block (Common RB 0) of the carrier. Its lowest subcarrier is also known as Point A.

Range bound	Explanation
maxnoofCandidateCells	Maximum no. of candidate cells. Value is 32
maxNARFCN	Maximum value of NR carrier frequency, defined in TS 38.331 [18]

9.3.3.41 UE RLF Report Container

This IE contains the RLF Report to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE RLF type	М			
>NR				
>>NR UE RLF Report Container	M		OCTET STRING	nr-RLF-Report-r16 IE contained in the UEInformationResponse message defined in TS 38.331 [18].
>LTE				
>>LTE UE RLF Report Container	M		OCTET STRING	RLF-Report-r9 IE contained in the UEInformationResponse message defined in TS 36.331 [21]

9.3.3.42 NID

This IE is used to identify (together with a PLMN identifier) a Stand-alone Non-Public Network.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NID	М		BIT STRING (SIZE(44))	Defined in TS 23.003 [23].

9.3.3.43 CAG ID

This IE is used to identify (together with a PLMN identifier) a Public Network Integrated NPN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CAG ID	M		BIT STRING (SIZE(32))	Defined in TS 23.003 [23].

9.3.3.44 NPN Support

For SNPN, this IE identifies a supported SNPN together with the associated PLMN ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE NPN Support	M			
>SNPN				
>>NID	M		9.3.3.43	

9.3.3.45 Allowed PNI-NPN List

This IE contains information on allowed UE mobility in PNI-NPN including allowed PNI-NPNs and whether the UE is allowed to access non-CAG cells for each PLMN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Allowed PNI-NPN Item		1 <maxnoofep LMNs+1></maxnoofep 		
>PLMN Identity	М		9.3.3.5	
>PNI-NPN Restricted	М		ENUMERATED (restricted, not-restricted,)	If set to "restricted", indicates that the UE is not allowed to access non-CAG cells for this PLMN.
>Allowed CAG List per PLMN		1 <maxnoofall owedCAGsper PLMN></maxnoofall 		
>>CAG ID	М		9.3.3.43	

Range bound	Explanation
maxnoofEPLMNs+1	Maximum no. of equivalent PLMNs plus one serving PLMN. Value is 16.
maxnoofAllowedCAGsperPLMN	Maximum number of CAGs per PLMN in UE's Allowed PNI-NPN list. Value is 256.

9.3.3.46 NPN Access Information

This IE contains information to perform access control for NPN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE NPN Access	M			
Information				
>PNI-NPN Access				
Information				
>>Cell CAG List	M		9.3.3.47	

9.3.3.47 Cell CAG List

This IE indicates the list of CAG IDs supported by a cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell CAG List		1 <maxnoofca GsperCell></maxnoofca 		
>CAG ID	M		9.3.3.43	

Range bound	Explanation
maxnoofCAGsperCell	Maximum no. of CAGs per cell. Value is 64. Max is 12 in this release.

9.3.3.48 UL CP Security Information

This IE contains NAS level security information to enable UE authentication by the AMF as described in TS 33.401 [27].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL NAS MAC	M		BIT STRING (SIZE(16))	Defined in TS 33.401 [27].
UL NAS Count	M		BIT STRING (SIZE(5))	Defined in TS 33.401 [27].

9.3.3.49 DL CP Security Information

This IE contains NAS level security information to be forwarded to the UE as described in TS 33.401 [27].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL NAS MAC	M		BIT STRING (SIZE(16))	Defined in TS 33.401 [27].

9.3.3.50 Configured TAC Indication

This IE indicates that in all NR cells served by the gNB, the TAC with which this IE is associated, is only configured but not broadcast.

NOTE: This IE is defined in accordance to the possibility foreseen in TS 38.331 [18] to not broadcast the TAC if the NR cell only supports PSCell/SCell functionality.

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

9.3.3.51 Extended AMF Name

This IE provides extended human readable name of the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
AMF Name Visible	0		VisibleString (SIZE(1150,))	
AMF Name UTF8	0		UTF8String (SIZE(1150,))	

9.3.3.52 Extended UE Identity Index Value

This IE is used by the NG-RAN node to calculate the Paging Frame as specified in TS 36.304 [29].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended UE Identity Index	M		BIT STRING	
Value			(SIZE(16))	

9.3.3.53 NR NTN TAI Information

This IE contains the TAI information for NR NTN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Serving PLMN	M		PLMN Identity 9.3.3.5	Indicates the UE's serving PLMN.
TAC List in NR NTN		1 <maxnoofta CsinNTN></maxnoofta 		Includes all TAC(s) broadcast in the cell, for the UE's serving PLMN.
>TAC	М		9.3.3.10	
UE Location Derived TAC in NR NTN	0		TAC 9.3.3.10	This IE contains TAC information derived from the actual UE location, if available.

Range bound	Explanation
maxnoofTACsinNTN	Maximum no. of TACs broadcast per cell. Value is 12.

9.3.3.54 Inter-system SON Information Request

This IE contains the request information to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Inter-system SON Information Request	М			
>NG-RAN Cell Activation				
>>Inter-system Cell Activation Request	М		9.3.3.56	
>Resource Status				
>>Inter-system Resource Status Request	М		9.3.3.59	

9.3.3.55 Inter-system SON Information Reply

This IE contains the reply information to be transferred.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Inter-system SON	M			
Information Reply				
>NG-RAN Cell Activation				
>>Inter-system Cell	M		9.3.3.58	
Activation Reply				
>Resource Status				
>>Inter-system Resource Status Reply	М		9.3.3.61	

9.3.3.56 Inter-system Cell Activation Request

This IE contains request information for inter-system Cell Activation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Activation ID	M		INTEGER (016384,)	Allocated by the eNB.
Cells to Activate List		1 <maxnoofce IlsinNGRANNo de></maxnoofce 		
>NG-RAN CGI	М		9.3.1.73	

Range bound	Explanation
maxnoofCellsinNGRANNode	Maximum no. of cells that can be served by a NG-RAN node. Value is 16384.

9.3.3.57 Inter-system Cell State Indication

This IE contains notification information for inter-system Cell Activation and Deactivation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Notification Cell List		1		
>Notification Cell Item		1 <maxnoofce IlsinNGRANNo de></maxnoofce 		
>>NG-RAN CGI	М		9.3.1.73	
>>Notify Flag	М		ENUMERATED (Activated, Deactivated,)	

Range bound	Explanation
maxnoofCellsinNGRANNode	Maximum no. of cells that can be served by a NG-RAN node. Value is 16384.

9.3.3.58 Inter-system Cell Activation Reply

This IE contains reply information for inter-system Cell Activation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Activated Cells List		1 <maxnoofce IlsinNGRANNo de></maxnoofce 		
>NG-RAN CGI	M		9.3.1.73	
Activation ID	М		INTEGER (016384,)	Allocated by the eNB.

Range bound	Explanation
maxnoofCellsinNGRANNode	Maximum no. of cells that can be served by a NG-RAN node. Value is
	16384.

9.3.3.59 Inter-system Resource Status Request

This IE contains information on the requested Inter-system Load Reporting reporting.

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IE/Group Name	Presence	Range	IE type and reference	Semantics description
Reporting System	М		9.3.1.237	
Report Characteristics	M		BITSTRING (SIZE(32))	Each position in the bitmap indicates measurement object the receiving node is requested to report. First Bit = Number of Active UEs, Second Bit = RRC connections, Third Bit = PRB. Other bits reserved for future use.
CHOICE report type	M			
>Event based reporting >>Inter-system Resource Threshold Low	M		INTEGER (0100)	Inter-system Resource Status reporting is enabled when Composite Available Capacity is above this threshold or is disabled when Composite Available Capacity is below this threshold.
				The reporting node sends a report when the cell Composite Available Capacity becomes greater than or equal to the threshold.
>>Inter-system Resource Threshold High	M		INTEGER (0100)	Inter-system Resource Status reporting is enabled when Composite Available Capacity is below this threshold or is disabled when Composite Available Capacity is above this threshold.
				The reporting node sends a report when the cell Composite Available Capacity becomes smaller than or equal to the threshold.
>>Number of Measurement Reporting Levels	0		ENUMERATED (2, 3, 4, 5, 10,)	The reporting node divides the cell load scale into the indicated number of reporting levels, evenly distributed on a linear scale between the Inter-system Resource Threshold Low and the Inter-system Resource Threshold High. The reporting node sends a report each time the cell load changes from one reporting level to another.
>Periodic Reporting				
>>Reporting Periodicity	M		ENUMERATED (stop, single, 1000ms, 2000ms, 5000ms, 10000ms,)	Periodicity that can be used for reporting. If the value is "stop", the reporting node is asked to stop the periodic reporting. If the value is "single" there is only one report.

Range bound	Explanation
maxnoofReportedCells	Maximum no. of cells that can be reported. Value is 256.

9.3.3.60 Inter-system Resource Status Report

This IE contains the Inter-system load report.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE Reporting System	M			
>E-UTRAN				
>>E-UTRAN Cell To Report List		1		
>>>E-UTRAN Cell To Report Item		1 <maxnoofre portedCells></maxnoofre 		
>>>>Cell ID	М		E-UTRA CGI 9.3.1.9	
>>>>E-UTRAN Composite Available Capacity Group	М		9.3.1.196	Corresponds to the <i>Composite</i> Available Capacity Group IE as defined in TS 36.423 [40].
>>>>Number of Active UEs	0		INTEGER (016777215,)	Corresponds to the <i>Number of Active UEs</i> IE as defined in TS 36.314 [49].
>>>>RRC Connections	0		INTEGER (165536,)	Corresponds to the <i>RRC</i> Connections IE as defined in TS 38.423 [24].
>>>>E-UTRAN Radio Resource Status	0		9.3.1.200	
>NG-RAN				
>>NG-RAN Cell To Report List		1		
>>>NG-RAN Cell To Report Item		1 <maxnoofre portedcells=""></maxnoofre>		
>>>>Cell ID	М		NG-RAN CGI 9.3.1.73	
>>>>NR Composite Available Capacity Group	M		9.3.1.201	Corresponds to the <i>Composite</i> Available Capacity Group IE as defined in TS 36.423 [40].
>>>>Number of Active UEs	0		INTEGER (016777215,)	Corresponds to the <i>Number of Active UEs</i> IE as defined in TS 38.423 [24].
>>>>RRC Connections	0		INTEGER (165536,)	Corresponds to the <i>RRC</i> Connections IE as defined in TS 38.423 [24].
>>>>NR Radio Resource Status	0		9.3.1.205	

Range bound	Explanation
maxnoofReportedCells	Maximum no. of cells that can be reported. Value is 256.

9.3.3.61 Inter-system Resource Status Reply

This IE indicates for which cell(s) the inter-system load reporting was successfully initiated.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Reporting System	М		9.3.1.237	

9.3.4 SMF Related IEs

9.3.4.1 PDU Session Resource Setup Request Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Aggregate Maximum Bit Rate	0		9.3.1.102	This IE shall be present when at least one Non-GBR QoS flow is being setup and is ignored otherwise.	YES	reject
UL NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs.	YES	reject
Additional UL NG-U UP TNL Information	0		UP Transport Layer Information List 9.3.2.12	UPF endpoint of the additional NG- U transport bearer(s), for delivery of UL PDUs for split PDU session.	YES	reject
Data Forwarding Not Possible	0		9.3.1.63	This IE may be present in case of HANDOVER REQUEST message and is ignored otherwise.	YES	reject
PDU Session Type	M		9.3.1.52		YES	reject
Security Indication Network Instance	0		9.3.1.27 9.3.1.113	This IE is ignored if the <i>Common Network Instance</i> IE is included.	YES YES	reject reject
QoS Flow Setup Request List		1			YES	reject
>QoS Flow Setup Request Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	М		9.3.1.51		-	
>>QoS Flow Level QoS Parameters	М		9.3.1.12		-	
>>E-RAB ID	0		9.3.2.3		-	
>>TSC Traffic Characteristics	0		9.3.1.130	This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore
>>Redundant QoS Flow Indicator	0		9.3.1.134	This IE indicates whether this QoS flow is requested for the redundant transmission.	YES	ignore
Common Network Instance	0		9.3.1.120		YES	ignore
Direct Forwarding Path Availability	0		9.3.1.64	This IE may be present in case of inter-system handover and intra-system handover.	YES	ignore
Redundant UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission.	YES	ignore

Additional Redundant UL NG-U UP TNL Information	0	UP Transport Layer Information List 9.3.2.12	UPF endpoint of the additional NG- U transport bearer(s), for delivery of redundant UL PDUs for split PDU session.	YES	ignore
Redundant Common Network Instance	0	Common Network Instance 9.3.1.120		YES	ignore
Redundant PDU Session Information	0	9.3.1.136		YES	ignore
MBS Session Setup Request List	0	9.3.1.211		YES	ignore

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

9.3.4.2 PDU Session Resource Setup Response Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL QoS Flow per TNL Information	М		QoS Flow per TNL Information 9.3.2.8	NG-RAN node endpoint of the NG-U transport bearer for delivery of DL PDUs, together with associated QoS flows.	-	•
Additional DL QoS Flow per TNL Information	O		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows and corresponding to the Additional UL NG-U UP TNL Information IE in the PDU Session Resource Setup Request Transfer IE.	-	
Security Result	0		9.3.1.59		-	
QoS Flow Failed to Setup List	0		QoS Flow List with Cause 9.3.1.13		-	
Redundant DL QoS Flow per TNL Information	O		QoS Flow per TNL Information 9.3.2.8	NG-RAN node endpoint of the NG-U transport bearer(s) for delivery of DL PDUs of the indicated Redundant QoS Flow(s) and corresponding to the Redundant UL NG-U UP TNL Information IE in the PDU Session Resource Setup Request Transfer IE.	YES	ignore
Additional Redundant DL QoS Flow per TNL Information	О		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of redundant DL PDUs for split PDU session, together with associated QoS flows and corresponding to the Additional Redundant UL NG- U UP TNL Information IE in the PDU Session Resource Setup Request Transfer IE.	YES	ignore

Used RSN Information	0	Redundant PDU Session Information 9.3.1.136	YES	ignore
Global RAN Node ID of Secondary NG-RAN Node	0	Global RAN Node ID 9.3.1.5	YES	ignore
MBS Support Indicator	0	9.3.1.210	YES	ignore
MBS Session Setup Response List	0	9.3.1.213	YES	ignore
MBS Session Failed to Setup List	0	9.3.1.214	YES	ignore

9.3.4.3 PDU Session Resource Modify Request Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Aggregate Maximum Bit Rate	0		9.3.1.102		YES	reject
UL NG-U UP TNL Modify List		01			YES	reject
>UL NG-U UP TNL Modify Item		1 <maxno ofMultiCon nectivity></maxno 		This IE(s) are included only for modification of an existing tunnel.	-	
>>UL NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs.	-	
>>DL NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2	Identifies the NG-U transport bearer at the NG-RAN node.	-	
>>Redundant UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission.	YES	ignore
>>Redundant DL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	Identifies the NG-U transport bearer at the NG-RAN node for the redundant transmission.	YES	ignore
Network Instance	0		9.3.1.113	This IE is ignored if the <i>Common</i> Network Instance IE is included.	YES	reject
QoS Flow Add or Modify Request List		01			YES	reject
>QoS Flow Add or Modify Request Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	М		9.3.1.51		-	
>>QoS Flow Level QoS Parameters	0		9.3.1.12		-	
>>E-RAB ID	0		9.3.2.3		-	
>>TSC Traffic Characteristics	0		9.3.1.130	This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore
>>Redundant QoS Flow Indicator	0		9.3.1.134	This IE indicates whether this QoS flow is requested for the redundant transmission.	YES	ignore
QoS Flow to Release List	0		QoS Flow List with Cause 9.3.1.13		YES	reject
Additional UL NG-U UP TNL Information	0		UP Transport Layer Information List 9.3.2.12	UPF endpoint of the additional NG- U transport bearer(s) proposed for delivery of UL PDUs for split PDU session.	YES	reject
Common Network Instance	0		9.3.1.120		YES	ignore

Additional Redundant UL NG-U UP TNL Information	0	UP Transport Layer Information List 9.3.2.12	UPF endpoint of the additional NG- U transport bearer(s) proposed for delivery of redundant UL PDUs for split PDU session.	YES	ignore
Redundant Common Network Instance	0	Common Network Instance 9.3.1.120		YES	ignore
Redundant UL NG-U UP TNL Information	0	UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission of the Redundant QoS Flow(s).	YES	ignore
Security Indication	0	9.3.1.27		YES	ignore
MBS Session Setup or Modify Request List	0	9.3.1.212		YES	ignore
MBS Session To Release List	0	9.3.1.215		YES	ignore

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU session. Value is 64.
maxnoofMultiConnectivity	Maximum no. of connectivity allowed for a UE. Value is 4. The current version
	of the specification supports up to 2 connectivity.

9.3.4.4 PDU Session Resource Modify Response Transfer

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs.	,	
UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	Identifies the NG-U transport bearer at the 5GC node.	1	
QoS Flow Add or Modify Response List		01			-	
>QoS Flow Add or Modify Response Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	M		9.3.1.51		-	
>>Current QoS Parameters Set Index	0		Alternative QoS Parameters Set Index 9.3.1.152	Index to the currently fulfilled alternative QoS parameters set	YES	Ignore
Additional DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows.	-	
QoS Flow Failed to Add or Modify List	0		QoS Flow List with Cause 9.3.1.13		-	
Additional NG-U UP TNL Information	0		UP Transport Layer Information Pair List 9.3.2.11	NG-RAN node endpoint of the NG-U transport bearer corresponding to the modified UPF endpoint received in the PDU Session Resource Modify Request Transfer IE in case of PDU session split.	YES	ignore
Redundant DL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs for the redundant transmission.	YES	ignore
Redundant UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	Identifies the NG-U transport bearer at the 5GC node for the redundant transmission.	YES	ignore
Additional Redundant DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of redundant DL PDUs for split PDU session, together with associated QoS flows.	YES	ignore

Additional Redundant NG-U UP TNL Information	O	UP Transpor Layer Information F List 9.3.2.11	endpoint of the NG-U transport bearer for delivery of redundant DL PDUs corresponding to the modified UPF endpoint(s) received in the UL NG-U UP TNL Modify List IE of the PDU Session Resource Modify Request Transfer IE in case of PDU	YES	ignore
Secondary RAT Usage Information	0	9.3.1.114	session split.	YES	ignore
MBS Support Indicator	0	9.3.1.210		YES	ignore
MBS Session Setup or Modify Response List	0	MBS Sessior Setup Respo List 9.3.1.213	·	YES	ignore
MBS Session Failed to Setup or Modify List	0	MBS Sessior Failed to Set List 9.3.1.214	·	YES	ignore

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

9.3.4.5 PDU Session Resource Notify Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow Notify List		01		•	-	•
>QoS Flow Notify Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	М		9.3.1.51		-	
>>Notification Cause	М		ENUMERATED (fullfilled, not fulfilled,)		-	
>>Current QoS Parameters Set Index	0		Alternative QoS Parameters Set Notify Index 9.3.1.153	Index to the currently fulfilled alternative QoS parameters set. Value 0 indicates that NG-RAN cannot even fulfil the lowest alternative parameters set.	YES	Ignore
QoS Flow Released List	0		QoS Flow List with Cause 9.3.1.13		-	
Secondary RAT Usage Information	0		9.3.1.114		YES	ignore
QoS Flow Feedback List		01			YES	ignore
>QoS Flow Feedback Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	M		9.3.1.51		-	
>>Update Feedback	0		BIT STRING { CN PDB DL(0), CN PDB UL(1)} (SIZE(8,))	Each position in the bitmap represents a QoS parameter. If a bit is set to "1", the respective parameter was not updated. If a bit is set to "0", the respective parameter was successfully updated. Bits 2-7 reserved for future use.	-	
>>CN Packet Delay Budget Downlink	0		Extended Packet Delay Budget 9.3.1.135	Indicates when the packet delay budget downlink was not updated in path switch that NG-RAN can offer this value	-	
>>CN Packet Delay Budget Uplink	0		Extended Packet Delay Budget 9.3.1.135	Indicates when the packet delay budget uplink was not updated in path switch that NG-RAN can offer this value	-	

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

9.3.4.6 PDU Session Resource Modify Indication Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL QoS Flow per TNL Information	M		QoS Flow per TNL Information 9.3.2.8	NG-RAN node endpoint of the NG-U transport bearer for delivery of DL PDUs, together with associated QoS flows.	-	
Additional DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows	-	
Secondary RAT Usage Information	0		9.3.1.114		YES	ignore
Security Result	0		9.3.1.59	Current UP security status	YES	ignore
Redundant DL QoS Flow per TNL Information	0		QoS Flow per TNL Information 9.3.2.8	NG-RAN node endpoint of the NG-U transport bearer for delivery of DL PDUs for the redundant transmission, together with associated QoS flows.	YES	ignore
Additional Redundant DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of Redundant DL PDUs for split PDU session, together with associated QoS flows.	YES	ignore
Global RAN Node ID of Secondary NG-RAN Node	0		Global RAN Node ID 9.3.1.5		YES	ignore

9.3.4.7 PDU Session Resource Modify Confirm Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow Modify Confirm List		1			-	
>QoS Flow Modify Confirm Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier UL NG-U UP TNL Information	M		9.3.1.51 UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer corresponding to the DL QoS Flow per TNL Information IE received in the PDU Session Resource Modify Indication Transfer IE.	-	
Additional NG-U UP TNL Information	0		UP Transport Layer Information Pair List 9.3.2.11	NG-RAN node endpoint of the NG-U transport bearer indicated in the PDU Session Resource Modify Indication Transfer IE and the corresponding UPF endpoint for split PDU session.	-	
QoS Flow Failed to Modify List	0		QoS Flow List with Cause 9.3.1.13		-	
Redundant UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer identified by the above redundant DL NG-U UP TNL Information IE for the redundant transmission.	YES	ignore
Additional Redundant NG-U UP TNL Information	0		UP Transport Layer Information Pair List 9.3.2.11	NG-RAN node endpoint of the NG-U transport bearer for the redundant transmission indicated in the PDU Session Resource Modify Indication Transfer IE and the corresponding UPF endpoint for split PDU session.	YES	ignore

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

9.3.4.8 Path Switch Request Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL NG-U UP TNL Information	М		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs.	-	,
DL NG-U TNL Information Reused	0		ENUMERATED (true,)	Indicates that DL NG-U TNL Information has been reused.	-	
User Plane Security Information	0		9.3.1.60		-	
QoS Flow Accepted List		1		QoS flows associated with the DL NG-U UP TNL Information IE.	-	
>QoS Flow Accepted Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	М		9.3.1.51		-	
>>Current QoS Parameters Set Index	0		Alternative QoS Parameters Set Index 9.3.1.152	Index to the currently fulfilled alternative QoS parameters set.	YES	ignore
Additional DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows.	YES	ignore
Redundant DL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of redundant DL PDUs.	YES	ignore
Redundant DL NG-U TNL Information Reused	0		ENUMERATED (true,)	Indicates that Redundant DL NG- U TNL Information has been reused.	YES	ignore
Additional Redundant DL QoS Flow per TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of Redundant DL PDUs for split PDU session, together with associated QoS flows.	YES	ignore
Used RSN Information	0		Redundant PDU Session Information 9.3.1.136		YES	ignore
Global RAN Node ID of Secondary NG-RAN Node	0		Global RAN Node ID 9.3.1.5		YES	ignore
MBS Support Indicator	0		9.3.1.210		YES	ignore

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

9.3.4.9 Path Switch Request Acknowledge Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer corresponding to the DL NG-U UP TNL Information IE received in the Path Switch Request Transfer IE.	-	
Security Indication	0		9.3.1.27		-	
Additional NG-U UP TNL Information	0		UP Transport Layer Information Pair List 9.3.2.11	NG-RAN node endpoint of the NG-U transport bearer indicated in the Path Switch Request Transfer IE and the corresponding UPF endpoint for split PDU session.	YES	ignore
Redundant UL NG-U UP TNL Information	О		UP Transport Layer Information 9.3.2.2	UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission.	YES	ignore
Additional Redundant NG-U UP TNL Information	0		UP Transport Layer Information Pair List 9.3.2.11	NG-RAN node endpoint of the NG-U transport bearer for the redundant transmission indicated in the Path Switch Request Transfer IE and the corresponding UPF endpoint for split PDU session.	YES	ignore
QoS Flow Parameters List		01			YES	ignore
>QoS Flow Parameters Item		1 <maxno ofQoSFlo ws></maxno 			-	
>>QoS Flow Identifier	М		9.3.1.51		-	
>>Alternative QoS Parameters Set List	0		9.3.1.151	Indicates alternative sets of QoS parameters for the QoS flow.	-	
>>CN Packet Delay Budget Downlink	0		Extended Packet Delay Budget 9.3.1.135	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	0	Extended Packet Delay Budget 9.3.1.135	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
>>Burst Arrival Time Downlink	0	Burst Arrival Time 9.3.1.133	Indicates the downlink Burst Arrival Time of the TSC QoS flow	YES	ignore

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

9.3.4.10 Handover Command Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL Forwarding UP TNL	0		UP Transport	To deliver	_	Criticality
Information			Layer	forwarded DL	_	
mormation			Information	PDUs per PDU		
			9.3.2.2	session tunnel.		
QoS Flow to be		01	0.0.2.2	COCCIOTI turifici.	_	
Forwarded List						
>QoS Flow to be Forwarded Item		1 <maxno ofQoSFlo</maxno 			-	
		ws>				
>>QoS Flow Identifier	М		9.3.1.51		-	
Data Forwarding Response DRB List	0		9.3.1.77		-	
Additional DL Forwarding UP TNL Information	0		QoS Flow per TNL Information List 9.3.2.1	NG-RAN node endpoint to deliver forwarded DL PDUs for split PDU session tunnel, together with associated QoS flows to be forwarded.	YES	ignore
UL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	To deliver forwarded UL PDUs	YES	reject
Additional UL Forwarding UP TNL Information	0		UP Transport Layer Information List 9.3.2.12	NG-RAN node endpoint to deliver forwarded UL PDUs for split PDU session tunnel.	YES	reject
Data Forwarding Response E-RAB List	0		9.3.1.121		YES	ignore
QoS Flow Failed to Setup List	0		QoS Flow List with Cause 9.3.1.13		YES	ignore

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

9.3.4.11 Handover Request Acknowledge Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL NG-U UP TNL Information	М		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs.	-	
DL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	To deliver forwarded DL PDUs.	-	
Security Result	0		9.3.1.59		-	
QoS Flow Setup Response List	M		QoS Flow List with Data Forwarding 9.3.2.13	QoS flows associated with the DL NG-U UP TNL Information IE.	-	
QoS Flow Failed to Setup List	0		QoS Flow List with Cause 9.3.1.13		-	
Data Forwarding Response DRB List	0		9.3.1.77		-	
Additional DL UP TNL Information for HO List		01			YES	ignore
>Additional DL UP TNL Information for HO Item		1 <maxno ofMultiCon nectivityMi nusOne></maxno 		Additional DL UP TNL Information for split PDU session, in the same order as the UPF endpoint of the additional NG- U transport bearer(s) received in the Handover Request Transfer IE of the Handover Request message.	-	
>>Additional DL NG-U UP TNL Information	M		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the additional NG-U transport bearer for delivery of DL PDUs.	-	
>>Additional QoS Flow Setup Response List	М		QoS Flow List with Data Forwarding 9.3.2.13	QoS flows associated with the Additional DL NG- U UP TNL Information IE.	-	
>>Additional DL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint to deliver forwarded DL PDUs.	-	
>>Additional Redundant DL NG-U UP TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the additional NG-U transport bearer for delivery of redundant DL PDUs.	YES	ignore
UL Forwarding UP TNL Information	0		UP Transport Layer Information 9.3.2.2	To deliver forwarded UL PDUs	YES	reject
Additional UL Forwarding UP TNL Information	0		UP Transport Layer Information List 9.3.2.12	NG-RAN node endpoint to deliver forwarded UL PDUs for split PDU session.	YES	reject

Data Forwarding	0	9.3.1.121		YES	ignore
Response E-RAB List					
Redundant DL NG-U UP TNL Information	0	UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs for the redundant transmission.	YES	ignore
Used RSN Information	0	Redundant PDU Session Information 9.3.1.136		YES	ignore
Global RAN Node ID of Secondary NG-RAN Node	0	Global RAN Node ID 9.3.1.5		YES	ignore
MBS Support Indicator	0	9.3.1.210		YES	ignore

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU session. Value is 64.
maxnoofMultiConnectivityMinusOne	Maximum no. of connectivity allowed for a UE minus one. Value is 3. The
	current version of the specification supports 1.

9.3.4.12 PDU Session Resource Release Command Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	

9.3.4.13 PDU Session Resource Notify Released Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Cause	M		9.3.1.2		-	
Secondary RAT Usage Information	0		9.3.1.114		YES	ignore

9.3.4.14 Handover Required Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Direct Forwarding Path Availability	0		9.3.1.64	

9.3.4.15 Path Switch Request Setup Failed Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	

9.3.4.16 PDU Session Resource Setup Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	
Criticality Diagnostics	0		9.3.1.3	

9.3.4.17 PDU Session Resource Modify Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	
Criticality Diagnostics	0		9.3.1.3	

9.3.4.18 Handover Preparation Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	
Cause	М		9.3.1.2		

9.3.4.19 Handover Resource Allocation Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	
Criticality Diagnostics	0		9.3.1.3	

9.3.4.20 Path Switch Request Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	
Cause	M		9.3.1.2		

9.3.4.21 PDU Session Resource Release Response Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Secondary RAT Usage Information	0		9.3.1.114		YES	ignore

9.3.4.22 PDU Session Resource Modify Indication Unsuccessful Transfer

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	

9.3.4.23 Secondary RAT Data Usage Report Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Secondary RAT Usage Information	0		9.3.1.114	

9.3.4.24 UE Context Resume Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Failed to Resume	0		QoS Flow List with	
List			Cause 9.3.1.13	

9.3.4.25 UE Context Resume Response Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Failed to Resume	0		QoS Flow List with	
List			Cause	
			9.3.1.13	

9.3.4.26 UE Context Suspend Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Suspend Indicator	0		ENUMERATED (true,)	

9.3.5 MB-SMF Related IEs

9.3.5.1 Void

9.3.5.2 Void

9.3.5.3 MBS Session Setup or Modification Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MBS Session TNL Information 5GC	0		9.3.2.15		YES	reject
MBS QoS Flows To Be Setup or Modified List	M		MBS QoS Flows To Be Setup List 9.3.1.236		YES	reject
MBS Session FSA ID List		0 <maxno ofMBSFS As></maxno 			YES	ignore
>MBS Frequency Selection Area Identity	М		OCTET STRING (SIZE(3))		-	

Range bound	Explanation
maxnoofMBSQoSFlows	Maximum no. of QoS Flows allowed within one MBS session. Value is 64.
maxnoofMBSFSAs	Maximum no. of FSA IDs for one MBS session. Value is 64.

9.3.5.4 Void

9.3.5.5 MBS Session Setup or Modification Response Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session TNL Information NG-RAN	0		9.3.2.17	

9.3.5.6 MBS Session Setup or Modification Failure Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cause	M		9.3.1.2	
Criticality Diagnostics	0		9.3.1.3	

9.3.5.7 MBS Distribution Setup Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session ID	M		9.3.1.206	
MBS Area Session ID	0		9.3.1.207	
Shared NG-U Unicast TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs.

9.3.5.8 MBS Distribution Setup Response Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and	Semantics description
			reference	
MBS Session ID	M		9.3.1.206	
MBS Area Session ID	0		9.3.1.207	
Shared NG-U Multicast TNL Information	0		9.3.2.16	
MBS QoS Flows To Be Setup List	М		9.3.1.236	
MBS Session Status	M		9.3.1.217	
MBS Service Area	0		9.3.1.208	

Range bound	Explanation
maxnoofMBSQoSFlows	Maximum no. of QoS Flows allowed within one MBS session. Value is 64.

9.3.5.9 MBS Distribution Setup Unsuccessful Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session ID	M		9.3.1.206	
MBS Area Session ID	0		9.3.1.207	
Cause	M		9.3.1.2	
Criticality Diagnostics	0		9.3.1.3	

9.3.5.10 MBS Distribution Release Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session ID	M		9.3.1.206	
MBS Area Session ID	0		9.3.1.207	
Shared NG-U Unicast TNL Information	0		UP Transport Layer Information 9.3.2.2	NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs.
Cause	М		9.3.1.2	

9.3.5.11 Multicast Session Activation Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session ID	M		9.3.1.206	

9.3.5.12 Multicast Session Deactivation Request Transfer

This IE is transparent to the AMF.

Ī	IE/Group Name	Presence	Range	IE type and reference	Semantics description
Ī	MBS Session ID	M		9.3.1.206	

9.3.5.13 Multicast Session Update Request Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MBS Session ID	M		9.3.1.206		YES	reject
MBS Service Area	0		9.3.1.208		YES	reject
MBS QoS Flows To Be Setup or Modified List	0		MBS QoS Flows To Be Setup List 9.3.1.236		YES	reject
MBS QoS Flow To Release List	0		QoS Flow List with Cause 9.3.1.13	This IE indicates the MBS QoS flow Identifiers of the MBS QoS flows to be released.	YES	reject
MBS Session TNL Information 5GC	0		9.3.2.15		YES	reject

Range bound	Explanation
maxnoofMBSQoSFlows	Maximum no. of QoS Flows allowed within one MBS session. Value is 64.

9.3.5.14 MBS Session Release Response Transfer

This IE is transparent to the AMF.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session TNL Information NG-RAN	0		9.3.2.17	

9.4 Message and Information Element Abstract Syntax (with ASN.1)

9.4.1 General

NGAP ASN.1 definition conforms to ITU-T Rec. X.691 [4], ITU-T Rec. X.680 [5] and ITU-T Rec. X.681 [6].

The ASN.1 definition specifies the structure and content of NGAP messages. NGAP 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 NGAP 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 NGAP 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 subclause 10.3.6.

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

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itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-PDU-Descriptions (0)}
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-- ASN1START
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MulticastSessionDeactivationResponse, MulticastSessionDeactivationRequest, LocationReportingFailureIndication, MulticastSessionActivationResponse, PDUSessionResourceModifyIndication, DownlinkUEAssociatedNRPPaTransport, MulticastSessionActivationFailure, MulticastSessionActivationRequest, PDUSessionResourceReleaseResponse, DownlinkRANConfigurationTransfer, PDUSessionResourceModifyResponse PDUSessionResourceReleaseCommand, PDUSessionResourceModifyRequest, PDUSessionResourceSetupResponse, PDUSessionResourceModifyConfirm, DownlinkRANEarlyStatusTransfer, PDUSessionResourceSetupRequest, MulticastSessionUpdateResponse, MulticastSessionUpdateFailure, MulticastSessionUpdateRequest, PathSwitchRequestAcknowledge, InitialContextSetupResponse, HandoverPreparationFailure, HandoverRequestAcknowledge, InitialContextSetupFailure, InitialContextSetupRequest, DownlinkRANStatusTransfer, HandoverCancel,
HandoverCancelAcknowledge, PathSwitchRequestFailure, LocationReportingControl, NASNonDeliveryIndication, PDUSessionResourceNotify, MulticastGroupPaging, NGResetAcknowledge, PathSwitchRequest, InitialUEMessage, HandoverReguired, PWSCancelRequest, ErrorIndication, HandoverSuccess, HandoverCommand, HandoverReguest, HandoverFailure, NGSetupResponse, HandoverNotify, NGSetupFailure, LocationReport, NGSetupRequest, PrivateMessage, OverloadStart, OverloadStop, NGReset, Paging,

FROM NGAP-PDU-Contents

id-AMFConfigurationUpdate,
id-AMFCPRelocationIndication,
id-AMFStatusIndication,
id-BroadcastSessionRelease,
id-BroadcastSessionReleaseRequired,
id-BroadcastSessionSetup,
id-CellTrafficTrace,
id-ConnectionEstablishmentIndication,

id-DeactivateTrace,

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id-DownlinkNonUEAssociatedNRPPaTransport,
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                                                                                                                                                                                        id-DownlinkUEAssociatedNRPPaTransport,
                                                                                                          id-DownlinkRANConfigurationTransfer,
                                                                                                                                  id-DownlinkRANEarlyStatusTransfer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                id-MulticastSessionDeactivation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        id-RRCInactiveTransitionReport,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 id-MulticastSessionActivation,
                                                                                                                                                                                                                                                                                                                             id-HandoverResourceAllocation,
                                                                                                                                                              id-DownlinkRANStatusTransfer,
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id-RANCPRelocationIndication,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     id-PDUSessionResourceModify,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 id-LocationReportingControl,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          id-MulticastSessionUpdate,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                id-UEContextModification,
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                                                                                                                                                                                                                                                                         id-HandoverNotification,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             id-MulticastGroupPaging,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         id-PWSFailureIndication,
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                                                      id-DownlinkNASTransport
                                                                                                                                                                                                                                                                                              id-HandoverPreparation,
                                                                                                                                                                                                                                                                                                                                                                                   id-InitialContextSetup,
                          id-DistributionRelease,
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id-DistributionSetup,
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                                                                                                                                                                                                                                                                                                                                                                                                     id-InitialUEMessage,
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                                                                                                                                                                                                                id-ErrorIndication,
                                                                                                                                                                                                                                                                                                                                                         id-HandoverSuccess,
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                                                                                                                                                                                                                                               id-HandoverCancel,
                                                                                                                                                                                                                                                                                                                                                                                                                                       id-LocationReport,
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id-OverloadStart,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  id-OverloadStop,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          id-TraceStart,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          id-NGReset,
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({NGAP-ELEMENTARY-PROCEDURES}{(@procedureCode}),
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                                                                                                                         id-UplinkNonUEAssociatedNRPPaTransport,
                                                                                                                                                                                                                             id-UplinkUEAssociatedNRPPaTransport,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                -- Interface Elementary Procedure Class
                                               id-UERadioCapabilityInfoIndication,
                                                                                                                                                    id-UplinkRANConfigurationTransfer,
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                                                                                                                                                                                                                                                                                                         id-DownlinkRIMInformationTransfer
                                                                                                                                                                             id-UplinkRANEarlyStatusTransfer,
                                                                                                                                                                                                                                                                                id-UplinkRIMInformationTransfer,
                        id-UERadioCapabilityIDMapping,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InitiatingMessage ::= SEQUENCE {
                                                                                                                                                                                                      id-UplinkRANStatusTransfer,
id-UERadioCapabilityCheck,
                                                                          id-UETNLABindingRelease,
                                                                                                                                                                                                                                                          id-WriteReplaceWarning,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -- Interface PDU Definition
                                                                                                 id-UplinkNASTransport,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        UNSUCCESSFUL OUTCOME
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({NGAP-ELEMENTARY-PROCEDURES}{(procedureCode}),
                                                                                                                                                  ({NGAP-ELEMENTARY-PROCEDURES}{@procedureCode}), ({NGAP-ELEMENTARY-PROCEDURES}{@procedureCode})
                                                                                                                                                                                                                                                                                                                                                                 ({NGAP-ELEMENTARY-PROCEDURES}{(@procedureCode})
({NGAP-ELEMENTARY-PROCEDURES}{@procedureCode})
                                                                                                                    ({NGAP-ELEMENTARY-PROCEDURES}),
                                                                                                                                                                                                                                                                                                         ({NGAP-ELEMENTARY-PROCEDURES}),
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  NGAP-ELEMENTARY-PROCEDURE. & Initiating Message
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NGAP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome
                                                                                                                    NGAP-ELEMENTARY-PROCEDURE. & procedureCode
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -- Interface Elementary Procedure List
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                                                                                          ::= SEQUENCE {
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3GPP TS 38.413 version 17.1.1 Release 17

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NGAP-ELEMENTARY-PROCEDURES-CLASS-2 NGAP-ELEMENTARY-PROCEDURE ::= {
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uplinkUEAssociatedNRPPaTransport,
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traceFailureIndication
                    uERadioCapabilityIDMapping
                                                                                                                                                                              aMFCPRelocationIndication
                                                                                                                                                                                                                                                                                                                                                                                                                                        downlinkRANStatusTransfer
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uERadioCapabilityCheck
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    INITIATING MESSAGE BroadcastSessionSetupReque
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downlinkNonUEAssociatedNRPPaTransport NGAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE
    DownlinkNonUEAssociatedNRPPaTransport
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ignore
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                                                                                                                                                                                                                                                                                                                           id-ConnectionEstablishmentIndication
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downlinkUEAssociatedNRPPaTransport NGAP-ELEMENTARY-PROCEDURE ::= {
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downlinkRANEarlyStatusTransfer NGAP-ELEMENTARY-PROCEDURE ::= {
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                        DownlinkRANEarlyStatusTransfer
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locationReportingFailureIndication NGAP-ELEMENTARY-PROCEDURE ::= {
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handoverSuccess NGAP-ELEMENTARY-PROCEDURE ::= {
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multicastSessionUpdate NGAP-ELEMENTARY-PROCEDURE ::= {
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id-NGSetup
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pDUSessionResourceModifyIndication NGAP-ELEMENTARY-PROCEDURE ::= {
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pwsFailureIndication NGAP-ELEMENTARY-PROCEDURE ::= {
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uplinkNonUEAssociatedNRPPaTransport NGAP-ELEMENTARY-PROCEDURE ::= {
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UERadioCapabilityCheckResponse
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                                                                                                                                                           writeReplaceWarning NGAP-ELEMENTARY-PROCEDURE ::= {
                                                                                                                                                                                                                                       id-WriteReplaceWarning
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                          AMF-TNLAssociationSetupList,
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                                                    AMF-TNLAssociationToAddList,
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AMFSetID,
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PDUSessionResourceFailedToSetupListCxtRes, PDUSessionResourceFailedToSetupListHOAck, PDUSessionResourceFailedToSetupListPSReg, PDUSessionResourceFailedToSetupListSURes, PDUSessionResourceSecondaryRATUsageList, RANStatusTransfer-TransparentContainer, PDUSessionResourceToReleaseListRelCmd PDUSessionResourceReleasedListRelRes, PDUSessionResourceToBeSwitchedDLList, PDUSessionResourceToReleaseListHOCmd, RGLevelWirelineAccessCharacteristics, PDUSessionResourceReleasedListPSFail PDUSessionResourceReleasedListPSAck, PDUSessionResourceSuspendListSUSReg, PDUSessionResourceResumeListRESReg, RRCInactiveTransitionReportRequest, PDUSessionResourceModifyListModReg, PDUSessionResourceResumeListRESRes, t PDUSessionResourceModifyListModCfm,PDUSessionResourceModifyListModInd PDUSessionResourceModifyListModRes, PDUSessionResourceReleasedListNot, PDUSessionResourceSetupListCxtReg, PDUSessionResourceSetupListCxtRes, PDUSessionResourceSetupListSUReg, PDUSessionResourceSetupListHOReg, PDUSessionResourceSetupListSURes, PDUSessionResourceListCxtRelReg, PDUSessionResourceListCxtRelCpl, PDUSessionResourceSwitchedList, PDUSessionResourceHandoverList, PDUSessionResourceNotifyList, PDUSessionResourceListHORgd, PEIPSassistanceInformation, RedirectionVoiceFallback, RRCEstablishmentCause, RelativeAMFCapacity, PWSFailedCellIDList, RANPagingPriority, PC5QoSParameters, RedCapIndication, RepetitionPeriod, PrivacyIndicator, PLMNSupportList, SecurityContext, QMCDeactivation, RAN-UE-NGAP-ID, QMCConfigInfo, PLMNIdentity, RANNodeName, Security Key, RoutingID, ResetType, RRCState,

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TargettoSource-Failure-TransparentContainer,
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                                                                                           SONConfigurationTransfer,
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TNLAssociationList,
                                                                                                                                                                                                                                                                                                             TAIListForRestart,
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                                             SliceSupportList,
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                        ServedGUAMIList,
SerialNumber,
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PrivateIE-Container{},

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id-CoreNetworkAssistanceInformationForInactive,
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ProtocolExtensionContainer{},
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                                                          ProtocolIE-ContainerList{},
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                                                                                                                                                NGAP-PRIVATE-IES, NGAP-PROTOCOL-EXTENSION,
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id-FiveG-ProSePC5QoSParameters,

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id-MulticastSessionDeactivationReguestTransfer,
                                                                                                                                                                                                                                                                                                              id-InfoOnRecommendedCellsAndRANNodesForPaging,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   id-MBS-DistributionSetupUnsuccessfulTransfer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          id-MulticastSessionActivationRequestTransfer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              id-ManagementBasedMDTPLMNModificationList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             id-MBS-DistributionReleaseRequestTransfer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   id-MBSSessionModificationResponseTransfer,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         id-MulticastSessionUpdateRequestTransfer,
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                                                                                                                                                                                                                                                                                                                                             id-IntersystemSONConfigurationTransferDL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       id-MBS-DistributionSetupResponseTransfer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       id-LTEUESidelinkAggregateMaximumBitrate,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    id-MBSSessionReleaseResponseTransfer,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     id-MulticastGroupPagingAreaList,
                                                                                                                                                                                                                                                                                                                                                                                                              id-LocationReportingRequestType,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                      id-LTEV2XServicesAuthorized,
                                                                                                                                                                                                                                               id-IMSVoiceSupportIndicator,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           id-MobilityRestrictionList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              id-NB-IoT-DefaultPagingDRX,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          id-NB-IoT-Paging-eDRXInfo,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      id-NewSecurityContextInd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             id-MessageIdentifier,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  id-NewAMF-UE-NGAP-ID,
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                                                                                                                                                                                                                      id-IABNodeIndication,
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                           id-GlobalRANNodeID,
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                                                                                                                                                                                        id-IAB-Supported,
                                                                                   id-HandoverFlag,
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                                                                                                                         id-HandoverType,
id-FiveG-S-TMSI,
                                                                                                                                                                                                                                                                                   id-IndexToRFSP,
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id-PDUSessionResourceFailedToModifyListModRes,
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                                                                                                                                                                                                                                     id-NRUESidelinkAggregateMaximumBitrate,
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                                                                                                                                                                                                                                                                               id-NumberOfBroadcastsRequested,
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                                                                                                                         id-NR-PagingeDRXInformation,
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                                                                           id-NPN-AccessInformation,
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id-PWSFailedCellIDList,

id-PC5QoSParameters,

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id-TargettoSource-Failure-TransparentContainer,
                                                                                                        id-RANStatusTransfer-TransparentContainer,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              id-SONConfigurationTransferDL,
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                                                                                                                                                                                   id-RedirectionVoiceFallback,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             id-TargetNSSAIInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       id-UE-DifferentiationInfo,
                                                                                                                                                                                                                                                                                                                                               id-RRCEstablishmentCause,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               id-SecurityKey,
id-SelectedPLMNIdentity,
                                                                                                                                                                                                               id-RelativeAMFCapacity,
                                                                               id-RANPagingPriority,
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                                                                                                                                                              id-RedCapIndication,
                                                                                                                                                                                                                                         id-RepetitionPeriod,
                                                                                                                                                                                                                                                                                                                                                                                                     id-RRC-Resume-Cause,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                      id-SecurityContext,
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                                                                                                                                  id-RAN-UE-NGAP-ID,
id-QMCConfigInfo,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       id-SerialNumber,
                                                     id-RANNodeName,
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                                                                                                                                                                                                                                                                  id-ResetType,
                                                                                                                                                                                                                                                                                                                        id-RoutingID,
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                                             id-UEPresenceInAreaOfInterestList,
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                                                                                         id-UERadioCapabilityForPaging,
                                                                                                                                                                                                                     id-UESliceMaximumBitRateList,
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                                                                         id-UERadioCapability,
                     id-UEPagingIdentity,
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id-UE-NGAP-IDS,
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{ ID id-CriticalityDiagnostics

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   TYPE RRCState
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{ ID id-NB-IOT-UEPriority

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{ ID id-UE-DifferentiationInfo
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  RAN-UE-NGAP-ID
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                   FiveG-S-TMSI
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ID id-SourceToTarget-TransparentContainer
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ID id-RAN-UE-NGAP-ID
ID id-HandoverType
ID id-Cause
ID id-TargetID
ID id-TargetID
                                                                                                                                                                                                                                                                                             Handover Preparation Elementary Procedure
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ID id-RAN-UE-NGAP-ID
ID id-FiveG-S-TMSI
ID id-EUTRA-CGI
ID id-TAI
ID id-TAI
ID id-UL-CP-SecurityInformation
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                       TYPE AMF-UE-NGAP-ID
                                                     TYPE RAN-UE-NGAP-ID
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                                                                             TYPE HandoverType
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ID id-PDUSessionResourceToReleaseListHOCmd
ID id-TargetToSource-TransparentContainer
ID id-CriticalityDiagnostics
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ID id-NASSecurityParametersFromNGRAN
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                       ID id-AMF-UE-NGAP-ID
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ID id-UserLocationInformation
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ID id-DDUSessionResourceToBeSwitchedDLList
ID id-PDUSessionResourceFailedToSetupListPSReq
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                                                                                                                                                                                                                  { {NGSetupFailureIEs} },
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRITICALITY ignore
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RAN Configuration Update Elementary Procedure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ID id-RANNodeName
ID id-SupportedTAList
ID id-DefaultPagingDRX
ID id-GlobalRANNodeID
ID id-NGRAN-TNLASsociationToRemoveList
ID id-NB-IOT-DefaultPagingDRX
                                                                                                                                                                                                                     ProtocolIE-Container
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProtocolIE-Container
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RAN CONFIGURATION UPDATE ACKNOWLEDGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RANConfigurationUpdate ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                  ID id-Cause
ID id-TimeToWait
ID id-CriticalityDiagnostics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ID id-Extended-RANNodeName
 { ID id-Extended-AMFName
                                                                                                                                                                                                  NGSetupFailure ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RAN CONFIGURATION UPDATE
                                                                                                                    NG SETUP FAILURE
                                                                                                                                                                                                                    protocolIEs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protocolIEs
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 PRESENCE mandatory
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 TYPE AMF-TNLAssociationToRemoveList
 TYPE PLMNSupportList
TYPE AMF-TNLAssociationToAddList
 TYPE RelativeAMFCapacity
 { {RANConfigurationUpdateAcknowledgeIEs} },
 ServedGUAMIList
 CRITICALITY ignore TYPE CriticalityDiagnostics
 TYPE CriticalityDiagnostics
 { {RANConfigurationUpdateFailureIEs} },
 { {AMFConfigurationUpdateIEs} },
 TYPE AMFName
 TYPE TimeToWait
 _{
m TYPE}
 TYPE Cause
 CRITICALITY reject
 reject
 CRITICALITY ignore
 reject
 ignore
 CRITICALITY ignore

 RANConfigurationUpdateAcknowledgeIEs NGAP-PROTOCOL-IES ::= {
 CRITICALITY
 CRITICALITY
 CRITICALITY
 CRITICALITY ignore
 CRITICALITY ignore CRITICALITY ignore
 RANConfigurationUpdateFailureIEs NGAP-PROTOCOL-IES ::= {
 AMFConfigurationUpdateIEs NGAP-PROTOCOL-IES ::= {
RANConfigurationUpdateAcknowledge ::= SEQUENCE {
 -- AMF Configuration Update Elementary Procedure
 RANConfigurationUpdateFailure ::= SEQUENCE
 ID id-AMFName
ID id-ServedGUAMIList
ID id-RelativeAMFCapacity
ID id-PLMNSupportList
ID id-AMF-TNLASsociationToAddList
ID id-AMF-TNLASsociationToRemoveList
 ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 AMFConfigurationUpdate ::= SEQUENCE {
 RAN CONFIGURATION UPDATE FAILURE
 { ID id-Cause { ID id-TimeToWait } ID id-TimeToWait } ID id-CriticalityDiagnostics
 { ID id-CriticalityDiagnostics
 -- AMF CONFIGURATION UPDATE
 protocolIEs
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 PRESENCE optional PRESENCE optional
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 PRESENCE optional
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 TYPE AMF-TNLAssociationSetupList
 TYPE AMF-TNLAssociationToUpdateList
 TYPE CriticalityDiagnostics
 TYPE TNLAssociationList
 { {AMFConfigurationUpdateAcknowledgeIEs} },
 TYPE Extended-AMFName
 { {AMFConfigurationUpdateFailureIEs} },
 TYPE CriticalityDiagnostics
 TYPE TimeToWait
 CRITICALITY ignore CRITICALITY ignore
 CRITICALITY ignore
 TYPE Cause
CRITICALITY ignore
 CRITICALITY iqnore

 AMFConfigurationUpdateAcknowledgeIEs NGAP-PROTOCOL-IES ::= {
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 AMFConfigurationUpdateFailureIEs NGAP-PROTOCOL-IES ::= {
 AMFConfigurationUpdateAcknowledge ::= SEQUENCE {
 { ID id-AMF-TNLASSOCiationSetupList
{ ID id-AMF-TNLASSOCiationFailedToSetupList
{ ID id-CriticalityDiagnostics
 AMF Status Indication Elementary Procedure
 AMFConfigurationUpdateFailure ::= SEQUENCE {
 { ID id-AMF-TNLASsociationToUpdateList { ID id-Extended-AMFName
 ProtocolIE-Container
 ProtocolIE-Container
 -- AMF CONFIGURATION UPDATE ACKNOWLEDGE
 -- AMF CONFIGURATION UPDATE FAILURE
 { ID id-Cause { ID id-TimeToWait { ID id-TimeToWait { ID id-CriticalityDiagnostics }
 AMFStatusIndication ::= SEQUENCE {
 -- AMF STATUS INDICATION
 protocolIEs
 protocolIEs
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PRESENCE optional
 PRESENCE optional
 TYPE UE-associatedLogicalNG-connectionList
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 __;
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 CRITICALITY ignore TYPE CriticalityDiagnostics
 CRITICALITY reject TYPE UnavailableGUAMIList
 CRITICALITY ignore
{ {AMFStatusIndicationIEs} },
 { {NGResetAcknowledgeIEs} },
 TYPE Cause
TYPE ResetType

 { {NGResetIEs} },

 CRITICALITY ignore CRITICALITY reject
 [ID id-UE-associatedLogicalNG-connectionList
 AMFStatusIndicationIEs NGAP-PROTOCOL-IES ::= {
 NGResetAcknowledgeIEs NGAP-PROTOCOL-IES ::= {
 ProtocolIE-Container
 ProtocolIE-Container
 -- Error Indication Elementary Procedure
 ProtocolIE-Container
 NGResetIEs NGAP-PROTOCOL-IES ::= {
 { ID id-CriticalityDiagnostics
 NGResetAcknowledge ::= SEQUENCE {
 { ID id-UnavailableGUAMIList
 -- NG Reset Elementary Procedure
 NG RESET ACKNOWLEDGE
 NGReset ::= SEQUENCE {
protocollEs Pro
 { ID id-Cause { ID id-ResetType
 protocolIEs
 protocolIEs
 -- NG RESET
```

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{ {ErrorIndicationIEs} },

ProtocolIE-Container

SEQUENCE

ErrorIndication ::=

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 PRESENCE optional PRESENCE optional
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 TYPE TrafficLoadReductionIndication
 PRESENCE
 TYPE OverloadStartNSSAIList
 TYPE OverloadResponse
 TYPE CriticalityDiagnostics
 TYPE AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 TYPE FiveG-S-TMSI
 { {OverloadStartIEs} },
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY ignore
 TYPE Cause
 { {OverloadStopIEs} },

 TYPE
 CRITICALITY ignore
 ignore
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY
 { ID id-AMFOverloadResponse } ID id-AMFTrafficLoadReductionIndication } ID id-OverloadStartNSSAIList
ErrorIndicationIEs NGAP-PROTOCOL-IES ::= {
 ProtocolIE-Container
 ProtocolIE-Container
 OverloadStopIEs NGAP-PROTOCOL-IES ::= {
 OverloadStartIEs NGAP-PROTOCOL-IES ::=
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID } C ID id-RAN-UE-NGAP-ID { ID id-Cause { ID id-CriticalityDiagnostics } C ID id-FiveG-S-TMSI
 OverloadStop ::= SEQUENCE {
 OverloadStart ::= SEQUENCE
 -- OVERLOAD START
 -- OVERLOAD STOP
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 PRESENCE optional PRESENCE optional
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 TYPE IntersystemSONConfigurationTransfer
 TYPE IntersystemSONConfigurationTransfer
 TYPE EN-DCSONConfigurationTransfer
 TYPE EN-DCSONConfigurationTransfer
 TYPE SONConfigurationTransfer
 TYPE SONConfigurationTransfer
 { {DownlinkRANConfigurationTransferIEs} },
 { {UplinkRANConfigurationTransferIEs} },
 CRITICALITY ignore
 CRITICALITY ignore CRITICALITY ignore
 CRITICALITY ignore CRITICALITY ignore
 CRITICALITY ignore

 DownlinkRANConfigurationTransferIEs NGAP-PROTOCOL-IES ::= {
 UplinkRANConfigurationTransferIEs NGAP-PROTOCOL-IES ::= {
 -- WARNING MESSAGE TRANSMISSION ELEMENTARY PROCEDURES
 DownlinkRANConfigurationTransfer ::= SEQUENCE {
 -- CONFIGURATION TRANSFER ELEMENTARY PROCEDURES
 UplinkRANConfigurationTransfer ::= SEQUENCE {
 -- Write-Replace Warning Elementary Procedure
 ProtocolIE-Container
 ProtocolIE-Container
 -- DOWNLINK RAN CONFIGURATION TRANSFER
 -- UPLINK RAN CONFIGURATION TRANSFER
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-- WRITE-REPLACE WARNING REQUEST

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 ConcurrentWarningMessageInd
 NumberOfBroadcastsRequested
 BroadcastCompletedAreaList
 WarningMessageContents
 CriticalityDiagnostics
 WarningAreaCoordinates
 { {WriteReplaceWarningResponseIEs} },
 WarningSecurityInfo
 MessageIdentifier
 MessageIdentifier
 DataCodingScheme
 RepetitionPeriod
 WarningAreaList
 { {WriteReplaceWarningRequestIEs} },
 SerialNumber
 SerialNumber
 WarningType
 TYPE
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 WriteReplaceWarningResponseIEs NGAP-PROTOCOL-IES ::= {
 WriteReplaceWarningRequestIEs NGAP-PROTOCOL-IES ::= {
 ProtocolIE-Container
 WriteReplaceWarningResponse ::= SEQUENCE
 ProtocolIE-Container
 WriteReplaceWarningRequest ::= SEQUENCE
 ID id-NumberOfBroadcastsRequested
ID id-WarningType
ID id-WarningSecurityInfo
 ID id-ConcurrentWarningMessageInd ID id-WarningAreaCoordinates
 ID id-MessageIdentifier
ID id-SerialNumber
ID id-BroadcastCompletedAreaList
ID id-CriticalityDiagnostics
 ID id-WarningMessageContents
 PWS Cancel Elementary Procedure
 -- WRITE-REPLACE WARNING RESPONSE
 ID id-MessageIdentifier
 ID id-SerialNumber
ID id-WarningAreaList
ID id-RepetitionPeriod
 ID id-DataCodingScheme
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-- PWS CANCEL REQUEST

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PRESENCE mandatory
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 PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 TYPE BroadcastCancelledAreaList
 TYPE CancelAllWarningMessages
 TYPE CriticalityDiagnostics
 TYPE MessageIdentifier
 TYPE MessageIdentifier
 TYPE WarningAreaList
 { {PWSRestartIndicationIEs} },
 TYPE SerialNumber
 SerialNumber
 { {PWSCancelResponseIEs} },
 { {PWSCancelRequestIEs} },

 TYPE
 ignore
 CRITICALITY reject
 ignore
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY reject
 reject
 CRITICALITY reject
 CRITICALITY
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 CRITICALITY
 -- PWS Restart Indication Elementary Procedure
 PWSCancelResponseIEs NGAP-PROTOCOL-IES ::= {
 PWSCancelRequestIEs NGAP-PROTOCOL-IES ::=
 ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 ID id-MessageIdentifier
ID id-SerialNumber
ID id-BroadcastCancelledAreaList
ID id-CriticalityDiagnostics
 { ID id-MessageIdentifier
{ ID id-SerialNumber
{ ID id-WarningAreaList
{ ID id-CancelAllWarningMessages
 PWSRestartIndication ::= SEQUENCE
 PWSCancelResponse ::= SEQUENCE
 ::= SEQUENCE
 -- PWS RESTART INDICATION
 -- PWS CANCEL RESPONSE
 PWSCancelRequest
 protocolIEs
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PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE mandatory } | PRESENCE mandatory },
 PRESENCE mandatory } |
 PRESENCE mandatory } | PRESENCE mandatory } |
 TYPE EmergencyAreaIDListForRestart
 { {DownlinkUEAssociatedNRPPaTransportIEs} },
 TYPE CellIDListForRestart
 TAIListForRestart
 TYPE PWSFailedCellIDList TYPE GlobalRANNodeID
 GlobalRANNodeID
 { {PWSFailureIndicationIEs} },
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 TYPE RoutingID TYPE NRPPA-PDU
 TYPE
 TYPE

 CRITICALITY reject
 CRITICALITY reject
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 CRITICALITY reject
 DownlinkUEAssociatedNRPPaTransportIEs NGAP-PROTOCOL-IES
 CRITICALITY reject
 CRITICALITY reject
 reject
 CRITICALITY reject
 DownlinkUEAssociatedNRPPaTransport ::= SEQUENCE {
 CRITICALITY
 }
=::
 PWSFailureIndicationIEs NGAP-PROTOCOL-IES ::= {
 -- PWS Failure Indication Elementary Procedure
PWSRestartIndicationIEs NGAP-PROTOCOL-IES
 ID id-GlobalRANNodeID
ID id-TAIListForRestart
ID id-EmergencyAreaIDListForRestart
 -- DOWNLINK UE ASSOCIATED NRPPA TRANSPORT
 ProtocolIE-Container
 ProtocolIE-Container
 -- NRPPA TRANSPORT ELEMENTARY PROCEDURES
 PWSFailureIndication ::= SEQUENCE
 [ID id-CellIDListForRestart
 { ID id-PWSFailedCellIDList { ID id-GlobalRANNodeID
 { ID id-AMF-UE-NGAP-ID
{ ID id-RAN-UE-NGAP-ID
{ ID id-RoutingID
{ ID id-NRPPa-PDU
 -- PWS FAILURE INDICATION
 protocolIEs
 protocolIEs
 :
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PRESENCE mandatory } | PRESENCE mandatory } | PRESENCE mandatory } | PRESENCE mandatory },
 PRESENCE mandatory } | PRESENCE mandatory },
 PRESENCE mandatory } | PRESENCE mandatory },
 { {UplinkUEAssociatedNRPPaTransportIEs} },
 CRITICALITY reject TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 CRITICALITY reject TYPE RAN-UE-NGA
CRITICALITY reject TYPE RoutingID
CRITICALITY reject TYPE NRPPa-PDU
 CRITICALITY reject TYPE RoutingID CRITICALITY reject TYPE NRPPa-PDU

 DownlinkNonUEAssociatedNRPPaTransportIEs NGAP-PROTOCOL-IES ::= {
 UplinkUEAssociatedNRPPaTransportIEs NGAP-PROTOCOL-IES ::= {
 UplinkUEAssociatedNRPPaTransport ::= SEQUENCE {
 -- DOWNLINK NON UE ASSOCIATED NRPPA TRANSPORT
 -- UPLINK NON UE ASSOCIATED NRPPA TRANSPORT
 ProtocolIE-Container
 -- UPLINK UE ASSOCIATED NRPPA TRANSPORT
 { ID id-AMF-UE-NGAP-ID
{ ID id-RAN-UE-NGAP-ID
{ ID id-RoutingID
{ ID id-NRPPa-PDU
 { ID id-RoutingID { ID id-NRPPa-PDU
 protocolIEs
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-- TRACE ELEMENTARY PROCEDURES

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PRESENCE mandatory
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 PRESENCE
 TYPE TraceActivation
 { {TraceFailureIndicationIEs} },
 TYPE RAN-UE-NGAP-ID
 TYPE AMF-UE-NGAP-ID
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 TYPE NGRANTraceID
 { {DeactivateTraceIEs} },
 { {TraceStartIEs} },

 TYPE
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY reject
 ignore
 ignore
 reject
 CRITICALITY
 CRITICALITY
 CRITICALITY
 TraceFailureIndicationIEs NGAP-PROTOCOL-IES ::= {
 ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 TraceStartIEs NGAP-PROTOCOL-IES ::= {
 TraceFailureIndication ::= SEQUENCE
 DeactivateTrace ::= SEQUENCE
 { ID id-AMF-UE-NGAP-ID id-RAN-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID } { ID id-NGRANTraceID } { ID id-Cause
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID { ID id-TraceActivation }
 -- TRACE FAILURE INDICATION
 TraceStart ::= SEQUENCE {
 -- DEACTIVATE TRACE
 protocollEs
 protocolIEs
 protocolIEs
 -- TRACE START
```

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PRESENCE mandatory
 PRESENCE mandatory PRESENCE mandatory

 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 PRESENCE mandatory
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 PRESENCE mandatory
 TYPE LocationReportingRequestType
 TransportLayerAddress
 { {LocationReportingControllEs} },
 PrivacyIndicator
 RAN-UE-NGAP-ID
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 NGRANTraceID
 URI-address
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 NGRAN-CGI
 TYPE NGRANTraceID
 { {CellTrafficTraceIEs} },
 TYPE
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m TYPE}
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 TYPE
 TYPE
 TYPE

 CRITICALITY reject
 CRITICALITY reject CRITICALITY ignore
 CRITICALITY reject
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 CRITICALITY reject
 CRITICALITY reject
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 CRITICALITY
 LocationReportingControlIEs NGAP-PROTOCOL-IES ::= {
 ProtocolIE-Container
 -- LOCATION REPORTING ELEMENTARY PROCEDURES
DeactivateTraceIEs NGAP-PROTOCOL-IES ::= {
 CellTrafficTraceIEs NGAP-PROTOCOL-IES ::=
 id-TraceCollectionEntityIPAddress
 { ID id-AMF-UE-NGAP-ID
{ ID id-RAN-UE-NGAP-ID
{ ID id-LocationReportingRequestType
 ProtocolIE-Container
 LocationReportingControl ::= SEQUENCE {
 {ID id-AMF-UE-NGAP-ID

{ID id-RAN-UE-NGAP-ID

{ID id-NGRANTraceID

{ID id-NGRAN-CGI

{ID id-TraceCollectionEntityIPAdd:

{ID id-PrivacyIndicator

{ID id-TraceCollectionEntityURI
 CellTrafficTrace ::= SEQUENCE {
 -- LOCATION REPORTING CONTROL
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID
 { ID id-NGRANTraceID
 -- CELL TRAFFIC TRACE
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 protocolIEs
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-- LOCATION REPORTING FAILURE INDICATION

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PRESENCE mandatory
PRESENCE optional
PRESENCE mandatory
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 PRESENCE mandatory
 PRESENCE mandatory } | PRESENCE mandatory } | PRESENCE mandatory },
 TYPE UEPresenceInAreaOfInterestList
 TYPE LocationReportingRequestType
 TYPE UserLocationInformation
 { {LocationReportingFailureIndicationIEs} },
 { {UETNLABindingReleaseRequestIEs} },
 TYPE AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 { {LocationReportIEs} },
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 TYPE
 CRITICALITY ignore
 TYPE Cause
 CRITICALITY reject
 CRITICALITY ignore
 ignore
 reject

 LocationReportingFailureIndicationIEs NGAP-PROTOCOL-IES ::= {
 CRITICALITY
 CRITICALITY
 CRITICALITY reject
 CRITICALITY ignore
 reject
 CRITICALITY
 LocationReportingFailureIndication ::= SEQUENCE
 ProtocolIE-Container
 UETNLABindingReleaseRequest ::= SEQUENCE {
 protocolIEs ProtocolIE-Container
 ProtocolIE-Container
 ID id-AMF-UE-NGAP-ID
ID id-RAN-UE-NGAP-ID
ID id-UserLocationInformation
ID id-UseresenceInAreaOfInterestList
ID id-LocationReportingRequestType
 LocationReportIEs NGAP-PROTOCOL-IES ::= {
 UE TNLA BINDING ELEMENTARY PROCEDURES
 -- UE TNLA BINDING RELEASE REQUEST
 LocationReport ::= SEQUENCE
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID { ID id-Cause
 -- LOCATION REPORT
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NGAP-PROTOCOL-IES ::= {

**UETNLABindingReleaseRequestIEs** 

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 PRESENCE mandatory
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 PRESENCE optional PRESENCE optional
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PRESENCE mandatory
PRESENCE optional
 __;
 UERadioCapabilityForPaging
 PRESENCE mandatory
 mandatory
 { {UERadioCapabilityInfoIndicationIEs} },
 { {UERadioCapabilityCheckRequestIEs} },
 UERadioCapability
 TYPE UERadioCapability
TYPE UERadioCapability
 PRESENCE
 AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 TYPE UERadioCapability
 TYPE AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 CRITICALITY reject TYPE AMF-UE-NGAP-ID CRITICALITY reject TYPE RAN-UE-NGAP-ID
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m TYPE}
 TYPE
 TYPE

 CRITICALITY reject
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 TYPE
 UERadioCapabilityInfoIndicationIEs NGAP-PROTOCOL-IES ::= {
 UE RADIO CAPABILITY MANAGEMENT ELEMENTARY PROCEDURES
 UERadioCapabilityCheckRequestIEs NGAP-PROTOCOL-IES ::=
 CRITICALITY reject
 CRITICALITY ignore
 reject
CRITICALITY reject
 UE Radio Capability Check Elementary Procedure
 CRITICALITY
 UERadioCapabilityInfoIndication ::= SEQUENCE
 ProtocolIE-Container
 ID id-AMF-UE-NGAP-ID
ID id-RAN-UE-NGAP-ID
ID id-UERadioCapability
ID id-UERadioCapabilityForPaging
ID id-UERadioCapabilityForPaging
ID id-UERadioCapabilityForPaging
 UERadioCapabilityCheckRequest ::= SEQUENCE
 ProtocolIE-Container
 UE RADIO CAPABILITY INFO INDICATION
 UE RADIO CAPABILITY CHECK REQUEST
 ID id-AMF-UE-NGAP-ID
ID id-RAN-UE-NGAP-ID
ID id-UERadioCapability
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID
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PRESENCE mandatory
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PRESENCE optional
 IMSVoiceSupportIndicator
 TYPE CriticalityDiagnostics
 { {UERadioCapabilityCheckResponseIEs} },
 AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 CRITICALITY reject TYPE UERadioCapabilityID
 { { PrivateMessageIEs } },
 TYPE
 TYPE
 TYPE

 CRITICALITY ignore
CRITICALITY reject
CRITICALITY ignore
 CRITICALITY ignore
 UERadioCapabilityCheckResponseIEs NGAP-PROTOCOL-IES ::= {
 ID id-AMF-UE-NGAP-ID
 CRITICALITY iq
 LID id-RAN-UE-NGAP-ID
 CRITICALITY iq
 CRITICALITY iq
 ID id-IMSVoiceSupportIndicator CRITICALITY re
 {
 ID id-CriticalityDiagnostics CRITICALITY iq
 }
 DATA USAGE REPORTING ELEMENTARY PROCEDURES
 UERadioCapabilityCheckResponse ::= SEQUENCE
 ProtocolIE-Container
 PrivateIE-Container
 -- PRIVATE MESSAGE ELEMENTARY PROCEDURE
 PrivateMessageIEs NGAP-PRIVATE-IES ::=
 UE RADIO CAPABILITY CHECK RESPONSE
 SECONDARY RAT DATA USAGE REPORT
 { ID id-UERadioCapabilityID
 PrivateMessage ::= SEQUENCE
 -- PRIVATE MESSAGE
 protocolIEs
 privateIEs
```

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PRESENCE mandatory
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 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 TYPE PDUSessionResourceSecondaryRATUsageList
 CRITICALITY ignore TYPE UserLocationInformation
 { ID id-RIMInformationTransfer CRITICALITY ignore TYPE RIMInformationTransfer PRESENCE optional
 TYPE AMF-UE-NGAP-ID
 TYPE RAN-UE-NGAP-ID
 TYPE HandoverFlag
 { {DownlinkRIMInformationTransferIEs} },
 { {UplinkRIMInformationTransferIEs} },
 { {SecondaryRATDataUsageReportIEs} },
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore

 UplinkRIMInformationTransferIEs NGAP-PROTOCOL-IES ::= {
 SecondaryRATDataUsageReportIEs NGAP-PROTOCOL-IES ::= {
 ID id-PDUSessionResourceSecondaryRATUsageList
 RIM INFORMATION TRANSFER ELEMENTARY PROCEDURES
 DownlinkRIMInformationTransfer ::= SEQUENCE {
 UplinkRIMInformationTransfer ::= SEQUENCE
 SecondaryRATDataUsageReport ::= SEQUENCE protocolIEs ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 -- DOWNLINK RIM INFORMATION TRANSFER
 { ID id-UserLocationInformation
 -- UPLINK RIM INFORMATION TRANSFER
 ID id-AMF-UE-NGAP-ID
 ID id-RAN-UE-NGAP-ID
 ID id-HandoverFlag
 protocolIEs
 protocolIEs
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PRESENCE mandatory
 mandatory
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 PRESENCE
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 PRESENCE
 PRESENCE
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 PRESENCE
 PRESENCE
 PRESENCE mandatory },
 { ID id-RIMInformationTransfer CRITICALITY ignore TYPE RIMInformationTransfer PRESENCE optional
 Enhanced-CoverageRestriction
 DL-CP-SecurityInformation
 { {UERadioCapabilityIDMappingRequestIEs} },
 UE-DifferentiationInfo
 ProtocolIE-Container { {ConnectionEstablishmentIndicationIEs} },
 UERadioCapabilityID
 CEmodeBrestricted
 UERadioCapability
 NB-IOT-UEPriority
 AMF-UE-NGAP-ID
 RAN-UE-NGAP-ID
 EndIndication
 AllowedNSSAI
 S-NSSAI
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 CRITICALITY reject
 CRITICALITY reject
 ignore
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 ignore
 CRITICALITY reject
 ConnectionEstablishmentIndicationIEs NGAP-PROTOCOL-IES ::= {
DownlinkRIMInformationTransferIEs NGAP-PROTOCOL-IES ::= {
 CRITICALITY
 CRITICALITY
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 CRITICALITY
 CRITICALITY
 CRITICALITY
 CRITICALITY
 CRITICALITY
 CRITICALITY
 UE RADIO CAPABILITY ID MAPPING ELEMENTARY PROCEDURES
 UERadioCapabilityIDMappingRequest ::= SEQUENCE {
 ConnectionEstablishmentIndication::= SEQUENCE
 { ID id-AMF-UE-NGAP-ID }
 { ID id-RAN-UE-NGAP-ID }
 { ID id-UERadioCapability }
 { ID id-EndIndication }
 { ID id-S-NSSAI }
 { ID id-AllowedNSSAI }
 { ID id-UE-DifferentiationInfo }
 { ID id-UE-DifferentiationInfo }
 { ID id-DL-CP-SecurityInformation }
 { ID id-NB-IOT-UEPriority }
 { ID id-NB-IOT-UEPriority }
 { ID id-Bhanced-CoverageRestriction }
 UE RADIO CAPABILITY ID MAPPING REQUEST
 ProtocolIE-Container
 -- Connection Establishment Indication
 ID id-CEmodeBrestricted
ID id-UERadioCapabilityID
 protocolIEs
 protocoliEs
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```

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PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 optional
 PRESENCE optional
 PRESENCE
 { {UERadioCapabilityIDMappingResponseIEs} },
 TYPE CriticalityDiagnostics
 TYPE UERadioCapabilityID
 TYPE UERadioCapability
 ProtocolIE-Container { { AMFCPRelocationIndicationIEs} },
 TYPE AMF-UE-NGAP-ID TYPE RAN-UE-NGAP-ID
 TYPE AllowedNSSAI
 TYPE S-NSSAI

 UERadioCapabilityIDMappingResponseIEs NGAP-PROTOCOL-IES ::=
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY ignore
 AMFCPRelocationIndicationIEs NGAP-PROTOCOL-IES ::= {
 UERadioCapabilityIDMappingResponse ::= SEQUENCE {
 Broadcast Session Setup Elementary Procedure
 -- MBS SESSION MANAGEMENT ELEMENTARY PROCEDURES
-- UE RADIO CAPABILITY ID MAPPING RESPONSE
 ProtocolIE-Container
 AMFCPRelocationIndication ::= SEQUENCE
 { ID id-UERadioCapabilityID { ID id-UERadioCapability } ID id-UERadioCapability } { ID id-CriticalityDiagnostics
 BROADCAST SESSION SETUP REQUEST
 -- AMF CP Relocation Indication
 { ID id-AMF-UE-NGAP-ID { ID id-RAN-UE-NGAP-ID } { ID id-S-NSSAI } { ID id-AllowedNSSAI }
 protocolIEs
 protocolIEs
 -
```

```
L TIFE MESSESSIONLU PRESENCE MANGALORY } | TYPE OCTET STRING (CONTAINING MESSESSIONSELUPOIMOGRESPONSETransfer) PRESENCE
 PRESENCE
 TYPE OCTET STRING (CONTAINING MBSSessionSetupOrModFailureTransfer) PRESENCE
 TYPE MBS-ServiceArea
TYPE OCTET STRING (CONTAINING MBSSessionSetupOrModRequestTransfer)
 PRESENCE optional
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory PRESENCE optional
 PRESENCE mandatory
 CRITICALITY ignore TYPE CriticalityDiagnostics
 TYPE Cause
TYPE CriticalityDiagnostics
 CRITICALITY reject TYPE MBS-SessionID
 TYPE MBS-SessionID
 TYPE MBS-SessionID
 ProtocolIE-Container { {BroadcastSessionSetupResponseIEs} },
 { {BroadcastSessionSetupRequestIEs} },
 TYPE S-NSSAI
 CRITICALITY reject

 CRITICALITY reject
CRITICALITY reject
 CRITICALITY ignore CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY reject
 CRITICALITY reject
 BroadcastSessionSetupResponseIEs NGAP-PROTOCOL-IES ::= {
 BroadcastSessionSetupFailureIEs NGAP-PROTOCOL-IES ::= {
 BroadcastSessionSetupResponse ::= SEQUENCE {
 BroadcastSessionSetupRequest ::= SEQUENCE {
 { ID id-MBS-SessionID } Id-MBSSessionSetupResponseTransfer
 ID id-MBS-SessionID
ID id-S-NSSAI
ID id-MBS-ServiceArea
ID id-MBSSessionSetupRequestTransfer
 { ID id-MBS-SessionID { ID id-MBSSessionSetupFailureTransfer
 ProtocolIE-Container
 -- BROADCAST SESSION SETUP RESPONSE
 -- BROADCAST SESSION SETUP FAILURE
 { ID id-Cause { ID id-CriticalityDiagnostics
 { ID id-CriticalityDiagnostics
 protocolIEs
 protocolIEs
 mandatory },
 optional
 optional
```

```
TYPE OCTET STRING (CONTAINING MBSSessionSetupOrModResponseTransfer) PRESENCE
 ~`
 TYPE OCTET STRING (CONTAINING MBSSessionSetupOrModReguestTransfer)
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 TYPE CriticalityDiagnostics
 TYPE MBS-ServiceArea
 TYPE MBS-SessionID
 TYPE MBS-SessionID
 { {BroadcastSessionModificationResponseIEs} },
 { {BroadcastSessionModificationRequestIEs} },
 { {BroadcastSessionModificationFailureIEs} },
 CRITICALITY reject
 CRITICALITY reject
 ID id-MBSSessionModificationResponseTransfer CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject

 BroadcastSessionModificationRequestIEs NGAP-PROTOCOL-IES ::= {
 Broadcast Session Modification Elementary Procedure
 BroadcastSessionModificationResponse ::= SEQUENCE {
 BroadcastSessionModificationRequest ::= SEQUENCE {
 BroadcastSessionModificationFailure ::= SEQUENCE
 { ID id-MBS-SessionID { ID id-MBS-ServiceArea } ID id-MBSSessionModificationRequestTransfer }
 -- BROADCAST SESSION MODIFICATION RESPONSE
 BROADCAST SESSION MODIFICATION FAILURE
 -- BROADCAST SESSION MODIFICATION REQUEST
 ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 { ID id-CriticalityDiagnostics
 PRESENCE optional
 protocolIEs
 protocolIEs
 protocolIEs
 optional
```

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TYPE OCTET STRING (CONTAINING MBSSessionSetupOrModFailureTransfer) PRESENCE
 __;
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional

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 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 TYPE Cause
TYPE CriticalityDiagnostics
 TYPE MBS-SessionID
 TYPE MBS-SessionID TYPE Cause
 CRITICALITY reject TYPE MBS-SessionID
 { {BroadcastSessionReleaseRequiredIEs} },
 ProtocolIE-Container { {BroadcastSessionReleaseRequestIEs} },
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY reject

 CRITICALITY reject
CRITICALITY ignore
BroadcastSessionModificationFailureIEs NGAP-PROTOCOL-IES ::= {
 BroadcastSessionReleaseRequiredIEs NGAP-PROTOCOL-IES ::= {
 -- Broadcast Session Release Required Elementary Procedure
 BroadcastSessionReleaseRequestIEs NGAP-PROTOCOL-IES ::= {
 ID id-MBSSessionModificationFailureTransfer
 Broadcast Session Release Elementary Procedure
 BroadcastSessionReleaseRequired ::= SEQUENCE {
 BroadcastSessionReleaseRequest ::= SEQUENCE {
 ProtocolIE-Container
 -- BROADCAST SESSION RELEASE REQUIRED
 -- BROADCAST SESSION RELEASE REQUEST
 { ID id-Cause { ID id-CriticalityDiagnostics
 { ID id-MBS-SessionID { ID id-Cause
 { ID id-MBS-SessionID
 { ID id-MBS-SessionID
 protocolies
 protocolIEs
 optional }
```

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FICALITY reject TYPE OCTET STRING (CONTAINING MBS-DistributionSetupRequestTransfer)
 ~~ ~
 ~`
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
PRESENCE mandatory
 TYPE MBSSessionReleaseResponseTransfer
 CRITICALITY reject TYPE MBS-AreaSessionID
 TYPE CriticalityDiagnostics
 CRITICALITY reject TYPE MBS-SessionID
 TYPE MBS-SessionID
 { {BroadcastSessionReleaseResponseIEs} },
 { {DistributionSetupRequestIEs} },
TYPE Cause
 CRITICALITY ignore CRITICALITY ignore
 reject

CRITICALITY ignore
 CRITICALITY
 BroadcastSessionReleaseResponseIEs NGAP-PROTOCOL-IES ::= {
 DistributionSetupRequestIEs NGAP-PROTOCOL-IES ::=
 ID id-MBS-SessionID
ID id-MBS-AreaSessionID
ID id-MBS-DistributionSetupRequestTransfer
 BroadcastSessionReleaseResponse ::= SEQUENCE
 id-MBSSessionReleaseResponseTransfer
 -- Distribution Setup Elementary Procedure
 ProtocolIE-Container
 DistributionSetupRequest ::= SEQUENCE {
 ProtocolIE-Container
 -- BROADCAST SESSION RELEASE RESPONSE
 { ID id-MBS-SessionID | ID id-MBSSessionReleaseRespoir | ID id-MBSSessionReleaseRespoir | ID id-CriticalityDiagnostics | ID id-MBS-SessionID | ID id-MBS-SessionID
 PRESENCE mandatory
 DISTRIBUTION SETUP RESPONSE
 DISTRIBUTION SETUP REQUEST
{ ID id-Cause
 protocolIEs
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 ~~
 TYPE MBS-AreaSessionID TYPE OCTET STRING (CONTAINING MBS-DistributionSetupResponseTransfer)
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory PRESENCE optional
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 TYPE OCTET STRING (CONTAINING MBS-
 TYPE CriticalityDiagnostics
 TYPE Cause
TYPE CriticalityDiagnostics
 TYPE MBS-AreaSessionID
 TYPE MBS-SessionID
 TYPE MBS-SessionID
 CRITICALITY reject TYPE MBS-SessionID
 { {DistributionReleaseRequestIEs} },
 { {DistributionSetupResponseIEs} },
 { {DistributionSetupFailureIEs} },
 CRITICALITY reject
CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY reject
 reject
 CRITICALITY ignore
 CRITICALITY

 DistributionSetupUnsuccessfulTransfer) PRESENCE mandatory }
 { ID id-MBS-SessionID { ID id-MBS-AreaSessionID } ID id-MBS-AreaSessionID { ID id-MBS-DistributionSetupUnsuccessfulTransfer
 DistributionReleaseRequestIEs NGAP-PROTOCOL-IES ::= {
 DistributionSetupFailureIEs NGAP-PROTOCOL-IES ::= {
 DistributionSetupResponseIEs NGAP-PROTOCOL-IES ::=
 ID id-MBS-AreaSessionID
ID id-MBS-DistributionSetupResponseTransfer
 Distribution Release Elementary Procedure
DistributionSetupResponse ::= SEQUENCE {
 ProtocolIE-Container
 ProtocolIE-Container
 ProtocolIE-Container
 DistributionSetupFailure ::= SEQUENCE {
 DistributionReleaseRequest ::= SEQUENCE
 { ID id-Cause { ID id-CriticalityDiagnostics
 DISTRIBUTION RELEASE REQUEST
 DISTRIBUTION SETUP FAILURE
 { ID id-MBS-SessionID
 ID id-MBS-SessionID
 protocolIEs
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 ___;
 ~`
TYPE MBS-AreaSessionID TYPE OCTET STRING (CONTAINING MBS-DistributionReleaseRequestTransfer)
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 TYPE OCTET STRING (CONTAINING
 TYPE CriticalityDiagnostics
 TYPE MBS-AreaSessionID
 TYPE MBS-SessionID
 TYPE MBS-SessionID
 { {MulticastSessionActivationRequestIEs} },
 TYPE Cause
 { {DistributionReleaseResponseIEs} },
 CRITICALITY ignore
CRITICALITY reject
CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject
CRITICALITY reject
 CRITICALITY reject
 CRITICALITY reject
 { ID id-MulticastSessionActivationRequestTransfer CRITICALIT MulticastSessionActivationRequestTransfer) PRESENCE mandatory },

 MulticastSessionActivationRequestIEs NGAP-PROTOCOL-IES ::= {
 DistributionReleaseResponseIEs NGAP-PROTOCOL-IES ::= {
 -- Multicast Session Activation Elementary Procedure
 { ID id-MBS-AreaSessionID { ID id-MBS-DistributionReleaseRequestTransfer }
 MulticastSessionActivationRequest ::= SEQUENCE
 DistributionReleaseResponse ::= SEQUENCE
 ProtocolIE-Container
 ProtocolIE-Container
 -- MULTICAST SESSION ACTIVATION RESPONSE
 MULTICAST SESSION ACTIVATION REQUEST
 { ID id-MBS-SessionID
{ ID id-MBS-AreaSessionID
{ ID id-CriticalityDiagnostics
 -- DISTRIBUTION RELEASE RESPONSE
 PRESENCE mandatory }
 { ID id-MBS-SessionID
 { ID id-Cause
 protocolIEs
 protocolIEs
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_
 __;
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 CRITICALITY ignore TYPE CriticalityDiagnostics
 TYPE MBS-SessionID
TYPE OCTET STRING (CONTAINING
 CRITICALITY reject TYPE MBS-SessionID CRITICALITY ignore TYPE CriticalityDiagnostics
 TYPE MBS-SessionID
 { | MulticastSessionDeactivationRequestIEs } },
{ {MulticastSessionActivationFailureIEs} },
 CRITICALITY ignore TYPE Cause
 CRITICALITY reject
 { ID id-MBS-SessionID CRITICALITY reject { ID id-MulticastSessionDeactivationRequestTransfer CRITICALITY reject ticastSessionDeactivationRequestTransfer) PRESENCE mandatory },

 MulticastSessionDeactivationRequestIEs NGAP-PROTOCOL-IES ::= {
 MulticastSessionActivationResponseIEs NGAP-PROTOCOL-IES ::= {
 MulticastSessionActivationFailureIEs NGAP-PROTOCOL-IES ::= {
 -- Multicast Session Deactivation Elementary Procedure
 MulticastSessionDeactivationRequest ::= SEQUENCE {
 MulticastSessionActivationFailure ::= SEQUENCE {
 MulticastSessionDeactivationRequestTransfer)
 -- MULTICAST SESSION DEACTIVATION REQUEST
 ProtocolIE-Container
 ProtocolIE-Container
 -- MULTICAST SESSION ACTIVATION FAILURE
 { ID id-MBS-SessionID { ID id-CriticalityDiagnostics
 { ID id-CriticalityDiagnostics
 { ID id-MBS-SessionID
 { ID id-Cause } |
 protocoliEs
 protocolIEs
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~~
 PRESENCE mandatory
 PRESENCE optional
 TYPE MBS-AreaSessionID PRESENCE optional TYPE OCTET STRING (CONTAINING MulticastSessionUpdateRequestTransfer)
 PRESENCE mandatory
 CRITICALITY ignore TYPE CriticalityDiagnostics
 CRITICALITY reject TYPE MBS-SessionID
 MulticastSessionDeactivationResponse := SEQUENCE {
مراحبات استرامه المراجبة المراجب
 TYPE MBS-SessionID
 { {MulticastSessionUpdateRequestIEs} },
 CRITICALITY reject
CRITICALITY reject
 CRITICALITY reject

 MulticastSessionDeactivationResponseIEs NGAP-PROTOCOL-IES ::= {
 MulticastSessionUpdateRequestIEs NGAP-PROTOCOL-IES ::= {
 { ID id-MBS-SessionID
{ ID id-MBS-AreaSessionID
{ ID id-MulticastSessionUpdateRequestTransfer
 -- Multicast Session Update Elementary Procedure
 MulticastSessionUpdateRequest ::= SEQUENCE {
 MulticastSessionUpdateResponse ::= SEQUENCE
 -- MULTICAST SESSION DEACTIVATION RESPONSE
 ProtocolIE-Container
 -- MULTICAST SESSION UPDATE RESPONSE
 -- MULTICAST SESSION UPDATE REQUEST
 { ID id-CriticalityDiagnostics
 PRESENCE mandatory },
 { ID id-MBS-SessionID
 protocolIEs
```

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___;
 PRESENCE mandatory
 PRESENCE mandatory
 PRESENCE optional
 PRESENCE optional
 PRESENCE mandatory
 PRESENCE optional PRESENCE optional
 ~~
 PRESENCE mandatory PRESENCE optional
 TYPE CriticalityDiagnostics
 TYPE CriticalityDiagnostics
 TYPE MBS-AreaSessionID
 TYPE MBS-AreaSessionID
 TYPE MBS-SessionID
 TYPE MBS-SessionID
 TYPE MBS-SessionID
TYPE MBS-ServiceArea
 TYPE Cause
{ {MulticastSessionUpdateResponseIEs} },
 { {MulticastSessionUpdateFailureIEs} },
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY reject
 { {MulticastGroupPagingIEs} },
 CRITICALITY reject
CRITICALITY reject
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY

 MulticastSessionUpdateFailureIEs NGAP-PROTOCOL-IES ::= {
 MulticastSessionUpdateResponseIEs NGAP-PROTOCOL-IES ::=
 MulticastGroupPagingIES NGAP-PROTOCOL-IES ::= {
 ID id-MBS-SessionID
 ID id-MBS-ServiceArea
 -- MULTICAST GROUP PAGING ELEMENTARY PROCEDURE
 MulticastSessionUpdateFailure ::= SEQUENCE
 ProtocolIE-Container
 ProtocolIE-Container
ProtocolIE-Container
 -- MULTICAST SESSION UPDATE FAILURE
 ID id-CriticalityDiagnostics
 MulticastGroupPaging ::= SEQUENCE
 ID id-MBS-AreaSessionID
 ID id-MBS-SessionID
 -- MULTICAST GROUP PAGING
 ID id-Cause
 protocolIEs
protocolIEs
 protocolIEs
```

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```
CRITICALITY ignore TYPE MulticastGroupPagingAreaList PRESENCE mandatory
{ ID id-MulticastGroupPagingAreaList
 -- ASN1STOP
```

## 9.4.5 Information Element Definitions

```
ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

 itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
 id-AdditionalRedundantDLQosFlowPerTNLInformation,
 id-AdditionalRedundantDL-NGU-UP-TNLInformation,
 id-AdditionalRedundantUL-NGU-UP-TNLInformation,
 id-AdditionalRedundantNGU-UP-TNLInformation,
 id-AdditionalDLForwardingUPTNLInformation,
 id-AdditionalULForwardingUPTNLInformation,
 id-AdditionalDLUPTNLInformationForHOList,
 id-AdditionalDLQosFlowPerTNLInformation,
 id-AdditionalUL-NGU-UP-TNLInformation,
 id-DirectForwardingPathAvailability,
 id-AdditionalNGU-UP-TNLInformation,
 id-CNTypeRestrictionsForEquivalent,
 id-DataForwardingResponseERABList,
 id-CNTypeRestrictionsForServing,
 -- Information Element Definitions
 id-DataForwardingNotPossible,
 id-AlternativeQoSParaSetList,
 id-BurstArrivalTimeDownlink,
 id-ConfiguredTACIndication,
 DEFINITIONS AUTOMATIC TAGS ::=
 id-CurrentQoSParaSetIndex,
 id-CNPacketDelayBudgetUL,
 id-CommonNetworkInstance,
 id-CNPacketDelayBudgetDL,
 id-DAPSResponseInfoList,
 id-DAPSRequestInfo,
 id-Cause,
-- ASN1START
 NGAP-IES {
 IMPORTS
 BEGIN
```

```
id-MBS-ActiveSessionInformation-SourcetoTargetList,
 id-MBS-ActiveSessionInformation-TargettoSourceList,
 id-NGAPIESupportInformationResponseList,
 id-MaximumIntegrityProtectedDataRate-DL,
 id-MBSSessionFailedtoSetuporModifyList,
 id-NGAPIESupportInformationRequestList,
 id-MBSSessionSetuporModifyResponseList
 id-MBSSessionSetuporModifyRequestList,
 id-IncludeBeamMeasurementsIndication,
 id-ExtendedRATRestrictionInformation,
 id-IntersystemSONInformationRequest,
 id-IntersystemResourceStatusUpdate,
 id-LocationReportingAdditionalInfo,
 id-IntersystemSONInformationReply,
 id-MBS-QoSFlowsToBeSetupModList,
 id-ExtendedUEIdentityIndexValue,
 id-EUTRA-PagingeDRXInformation,
 id-MBSSessionSetupResponseList,
 id-ExtendedTAISliceSupportList,
 id-MBSSessionFailedtoSetupList,
 id-MBSSessionSetupRequestList,
 id-ExtendedReportIntervalMDT,
 id-ExtendedPacketDelayBudget,
 id-MBS-QoSFlowsToBeSetupList,
 id-EndpointIPAddressAndPort,
 id-ExtendedSliceSupportList,
 id-LastEUTRAN-PLMNIdentity,
 id-MBS-QoSFlowToReleaseList,
id-DL-NGU-UP-TNLInformation,
 id-MBSSessionToReleaseList,
 id-EnergySavingIndication,
 id-LastVisitedPSCellList,
 id-MBS-SessionTNLInfo5GC,
 id-MBS-SessionFSAIDList,
 id-MBS-SupportIndicator,
 id-MBS-AreaSessionID,
 id-M6DelayThreshold,
 id-MDTConfiguration,
 id-NetworkInstance,
 id-MBS-ServiceArea,
 id-GlobalRANNodeID,
 id-M7ReportAmount,
 id-GlobalCable-ID,
 id-M5ReportAmount,
 id-M4ReportAmount,
 id-GlobalW-AGF-ID,
 id-M6ReportAmount,
 id-MBS-SessionID,
 id-GlobalTNGF-ID,
 id-GlobalTWIF-ID,
 id-MicoallPLMN,
 id-GUAMIType,
 id-NR-CGI,
```

id-NRNTNTAIInformation,

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id-OldAssociatedQosFlowList-ULendmarkerexpected,
 id-PDUSessionResourceFailedToSetupListCxtFail,
 id-PDUSessionResourceReleaseResponseTransfer,
 id-TNLAssociationTransportLayerAddressNGRAN,
 id-PduSessionExpectedUEActivityBehaviour,
 id-RedundantDL-NGU-TNLInformationReused,
 id-PagingCauseIndicationForVoiceService,
 id-RedundantDLQosFlowPerTNLInformation,
 id-PDUSessionAggregateMaximumBitRate,
 id-RedundantDL-NGU-UP-TNLInformation,
 id-RedundantUL-NGU-UP-TNLInformation,
 id-NPN-PagingAssistanceInformation,
 id-QosMonitoringReportingFrequency,
 id-RedundantPDUSessionInformation,
 id-RedundantCommonNetworkInstance,
 id-UEHistoryInformationFromTheUE,
 id-QosFlowAddOrModifyRequestList,
 id-SuccessfulHandoverReportList,
 id-SecondaryRATUsageInformation,
 id-PagingAssisDataforCEcapabUE,
 id-UEContextReferenceAtSource,
 id-UERadioCapabilityForPaging,
 id-PEIPSassistanceInformation,
 id-RedundantQosFlowIndicator,
 id-TSCTrafficCharacteristics,
 id-NR-PagingeDRXInformation,
 id-QosFlowFailedToSetupList,
 id-TraceCollectionEntityURI,
id-NPN-MobilityInformation,
 id-QosFlowSetupRequestList,
 id-QosFlowParametersList,
 id-SourceNodeTNLAddrInfo,
id-SourceTNLAddrInfo,
 id-QosFlowToReleaseList,
 id-SONInformationReport,
 id-QosFlowFeedbackList,
 id-QosMonitoringRequest
 id-SecurityIndication,
 id-TAINSAGSupportList,
 id-PSCellInformation,
 id-OnboardingSupport,
 id-PDUSessionPairID,
 id-RAT-Information,
 id-SgNB-UE-X2AP-ID,
 id-PDUSessionType,
 id-SecurityResult,
 id-QMCConfigInfo,
 id-SourceNodeID,
 id-TargetRNC-ID,
 id-SurvivalTime,
 id-NPN-Support,
 id-SCTP-TLAS,
 id-S-NSSAI,
```

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id-UERadioCapabilityForPagingOfNB-IOT,
 maxnoofMultiConnectivityMinusOne,
 id-ULForwardingUP-TNLInformation,
 maxnoofMBSServiceAreaInformation,
 id-UserLocationInformationW-AGF,
 id-UserLocationInformationTNGF,
 id-UserLocationInformationTWIF,
 maxnoofCellsUEMovingTrajectory,
 id-UL-NGU-UP-TNLInformation,
 maxnoofCellsinUEHistoryInfo,
 maxnoofNGConnectionsToReset,
 id-UL-NGU-UP-TNLModifyList,
 maxnoofAllowedAreas,
maxnoofAllowedCAGsperPLMN,
 maxnoofMBSAreaSessionIDs,
 maxnoofMultiConnectivity,
 maxnoofNGAPIESupportInfo,
 maxnoofCellsinngeNB, maxnoofCellsinNGRANNode,
 maxnoofCellIDforWarning,
 maxnoofAllowedS-NSSAIs,
 maxnoofEmergencyArealD,
 maxnoofMBSSessionsofUE,
 id-UsedRSNInformation,
 maxnoofNeighPCIforMDT,
 maxnoofCandidateCells,
 maxnoofEAIforRestart,
 maxnoofEPLMNsPlusOne,
 maxnoofBluetoothName,
 maxnoofExtSliceItems,
 maxnoofCellIDforMDT,
maxnoofCellIDforQMC,
 maxnoofCAGSperCell,
 maxnoofMBSSessions,
 maxNRARFCN,
maxnoofNRCellBands,
 maxnoofCellsforMBS,
 maxnoofMBSQoSFlows,
 maxnoofCellsingNB,
 maxnoofFreqforMDT,
 maxnoofCellinAoI,
 maxnoofCellinEAI,
 maxnoofCellinTAI,
 maxnoofMDTPLMNs,
 id-ULForwarding,
 maxnoofForbTACs,
 maxnoofMBSFSAs,
 maxnoofBPLMNs,
 maxnoofErrors,
 maxnoofEPLMNs,
 maxnoofE-RABs,
 maxnoofNSAGs,
 maxnoofDRBs,
 maxnoofMRBs,
```

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maxnoofPagingAreas, maxnoofPC5QoSFlows,

```
maxnoofPSCellsPerPrimaryCellinUEHistoryInfo,
 ProtocolIE-SingleContainer{},
 ProtocolExtensionContainer{},
 maxnoofSuccessfulHOReports,
 maxnoofRecommendedRANNodes,
 NGAP-PROTOCOL-EXTENSION,
 maxnoofRecommendedCells,
 ProtocolIE-Container{},
 maxnoofTNLAssociations,
 maxnoofTAlinAol,
maxnoofTargetS-NSSAls,
 maxnoofUEAppLayerMeas,
 maxnoofTAIforInactive,
 TriggeringMessage
FROM NGAP-CommonDataTypes
 maxnoofTAIforWarning,
 maxnoofReportedCells,
 maxnoofTAIforRestart,
 maxnoofServedGUAMIS,
 maxnoofTAIforPaging,
 maxnoofUEsforPaging,
 maxnoofRANNodeinAoI,
 maxnoofSNSSAIforQMC,
 maxnoofTimePeriods,
 maxnoofQosParaSets,
maxnoofPDUSessions,
 maxnoofSensorName,
 maxnoofSliceItems,
 maxnoofXnGTP-TLAs,
 maxnoofPLMNforOMC,
 NGAP-PROTOCOL-IES
 FROM NGAP-Containers;
 maxnoofTACsinNTN,
 maxnoofTAIforMBS,
 maxnoofXnExtTLAs,
 maxnoofQosFlows,
 maxnoofTAforMDT,
 maxnoofTAforQMC,
 maxnoofWLANName,
 FROM NGAP-Constants
 Criticality,
ProcedureCode,
 ProtocoliE-ID,
 maxnoofPLMNs,
 maxnoofXnTLAs
 maxnoofTACs,
 maxnoofAoI,
```

-- A

```
~`
 PRESENCE optional
AdditionalDLUPTNLInformationForHOList ::= SEQUENCE (SIZE(1..maxnoofMultiConnectivityMinusOne)) OF AdditionalDLUPTNLInformationForHOItem
 EXTENSION UPTransportLayerInformation
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {AllocationAndRetentionPriority-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { { AdditionalDLUPTNLInformationForHOItem-ExtIES} }
 ProtocolExtensionContainer { {Allowed-PNI-NPN-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {AllowedNSSAI-Item-ExtIEs} } OPTIONAL,
 Allowed-PNI-NPN-List ::= SEQUENCE (SIZE(1...maxnoofEPLMNsPlusOne)) OF Allowed-PNI-NPN-Item
 Allowed-CAG-List-per-PLMN ::= SEQUENCE (SIZE(1...maxnoofAllowedCAGsperPLMN)) OF CAG-ID
 QosFlowListWithDataForwarding,
 AllowedNSSAI ::= SEQUENCE (SIZE(1..maxnoofAllowedS-NSSAIs)) OF AllowedNSSAI-Item
 UPTransportLayerInformation,
 UPTransportLayerInformation
 ENUMERATED {restricted, not-restricted, ...},
 { ID id-AdditionalRedundantDL-NGU-UP-TNLInformation CRITICALITY ignore
 AdditionalDLUPTNLInformationForHOItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AllocationAndRetentionPriority-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 Pre-emptionVulnerability,
 Allowed-CAG-List-per-PLMN,
 Pre-emptionCapability,
 PriorityLevelARP,
 AdditionalDLUPTNLInformationForHOItem ::= SEQUENCE
 AllowedNSSAI-Item-ExtIEs NGAP-PROTOCOL-EXTENSION
 PLMNIdentity,
 AllocationAndRetentionPriority ::= SEQUENCE {
 AdditionalQosFlowInformation ::= ENUMERATED
 additionalDLForwardingUPTNLInformation
 additionalQosFlowSetupResponseList
 additionalDL-NGU-UP-TNLInformation
 Allowed-PNI-NPN-Item ::= SEQUENCE {
 S-NSSAI,
 SEQUENCE
 allowed-CAG-List-per-PLMN
 pre-emptionVulnerability
 pre-emptionCapability
 pNI-NPN-restricted
 AllowedNSSAI-Item ::=
 priorityLevelARP
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 pLMNIdentity
 more-likely,
```

```
AMF-TNLAssociationSetupList := SEQUENCE (SIZE(1..maxnoofTNLAssociations)) OF AMF-TNLAssociationSetupItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 AlternativeQoSParaSetList ::= SEQUENCE (SIZE(1...maxnoofQosParaSets)) OF AlternativeQoSParaSetItem
 ProtocolExtensionContainer { {AlternativeQoSParaSetItem-ExtIEs} }
 ProtocolIE-SingleContainer { {AMFPagingTarget-ExtIEs} }
 AlternativeQoSParaSetIndex,
 AllowedTACs ::= SEQUENCE (SIZE(1..maxnoofAllowedAreas)) OF TAC
 AlternativeQoSParaSetItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AMFNameVisibleString ::= VisibleString (SIZE(1..150, ...))
 PacketDelayBudget
Allowed-PNI-NPN-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 PacketErrorRate
 AlternativeQoSParaSetNotifyIndex ::= INTEGER (0..8,
 AlternativeQoSParaSetIndex ::= INTEGER (1..8, ...)
 BitRate
 BitRate
 AMFName ::= PrintableString (SIZE(1..150, ...))
 AMFNameUTF8String ::= UTF8String (SIZE(1..150,
 AMFPagingTarget-ExtIEs NGAP-PROTOCOL-IES ::= {
 GlobalRANNodeID
 AMF-TNLAssociationSetupItem ::= SEQUENCE
 AlternativeQoSParaSetItem ::= SEQUENCE
 AMFRegionID ::= BIT STRING (SIZE(8))
 AMFPointer ::= BIT STRING (SIZE(6))
 AMFSetID ::= BIT STRING (SIZE(10))
 alternativeQoSParaSetIndex
 AMFPagingTarget ::= CHOICE {
 guaranteedFlowBitRateDL
 guaranteedFlowBitRateUL
 packetDelayBudget
packetErrorRate
 choice-Extensions
 globalRANNodeID
 iE-Extensions
```

```
[ID id-TNLAssociationTransportLayerAddressNGRAN CRITICALITY reject EXTENSION CPTransportLayerInformation PRESENCE optional),
 AMF-TNLAssociationToRemoveList ::= SEQUENCE (SIZE(1..maxnoofTNLAssociations)) OF AMF-TNLAssociationToRemoveItem
 AMF-TNLAssociationToUpdateList ::= SEQUENCE (SIZE(1..maxnoofTNLAssociations)) OF AMF-TNLAssociationToUpdateItem
 AMF-TNLAssociationToAddList ::= SEQUENCE (SIZE(1..maxnoofTNLAssociations)) OF AMF-TNLAssociationToAddItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL
 OPTIONAL
 ProtocolExtensionContainer { {AMF-TNLAssociationSetupItem-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {AMF-TNLAssociationToAddItem-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {AMF-TNLAssociationToRemoveItem-ExtIEs} }
 ProtocolExtensionContainer { {AMF-TNLAssociationToUpdateItem-ExtIEs} }
 OPTIONAL,
 AMF-TNLAssociationToRemoveItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AMF-TNLAssociationToUpdateItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CPTransportLayerInformation,
CPTransportLayerInformation,
 CPTransportLayerInformation,
 CPTransportLayerInformation,
 AMF-TNLAssociationSetupItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 AMF-TNLAssociationToAddItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 TNLAddressWeightFactor,
 TNLAddressWeightFactor
 AreaOfInterestTAIList
 TNLAssociationUsage
 TNLAssociationUsage
 ::= SEQUENCE {
 AMF-INLAssociationToRemoveItem ::= SEQUENCE {
 AMF-UE-NGAP-ID ::= INTEGER (0..1099511627775)
 AMF-TNLAssociationToAddItem ::= SEQUENCE {
 AMF-TNLAssociationToUpdateItem
aMF-TNLAssociationAddress
 aMF-TNLAssociationAddress
 aMF-TNLAssociationAddress
 aMF-TNLAssociationAddress
 AreaOfInterest ::= SEQUENCE
 tNLAddressWeightFactor
 tNLAddressWeightFactor
 areaOfInterestTAIList
 tNLAssociationUsage
 tNLAssociationUsage
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

```
OPTIONAL,
 AreaOfInterestRANNodeList ::= SEQUENCE (SIZE(1..maxnoofRANNodeinAoI)) OF AreaOfInterestRANNodeItem
 OPTIONAL,
 ProtocolExtensionContainer { {AreaOfInterestCellItem-ExtIEs} } OPTIONAL,
 erenceID
LocationReportingReferenceID,
ProtocolExtensionContainer { {AreaOfInterestItem-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {AreaOfInterestRANNodeItem-ExtIEs} }
 AreaOfInterestCellList ::= SEQUENCE (SIZE(1..maxnoofCellinAoI)) OF AreaOfInterestCellItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 AreaOfInterestTAIList ::= SEQUENCE (SIZE(1..maxnoofTAIinAoI)) OF AreaOfInterestTAIItem
 ProtocolExtensionContainer { {AreaOfInterestTAIItem-ExtIEs} }
 ProtocolExtensionContainer { {AreaOfInterest-ExtIEs} }
 AreaOfInterestList ::= SEQUENCE (SIZE(1..maxnoofAoI)) OF AreaOfInterestItem
 AreaOfInterestRANNodeList
 AreaOfInterestRANNodeItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
AreaOfInterestCellList
 AreaOfInterestCellItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 AreaOfInterest,
 AreaOfInterestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 AreaOfInterest-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 AreaOfInterestRANNodeItem ::= SEQUENCE {
 GlobalRANNodeID,
 AreaOfInterestCellItem ::= SEQUENCE { nGRAN-CGI
 AreaOfInterestTAIItem ::= SEQUENCE {
 locationReportingReferenceID
 AreaOfInterestItem ::= SEQUENCE
 areaOfInterestRANNodeList
 TAI,
 areaOfInterestCellList
 globalRANNodeID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

```
OPTIONAL
 PRESENCE optional } | PRESENCE optional },
 AssociatedMBSQosFlowSetuporModifyRequestList ::= SEQUENCE (SIZE(1...maxnoofMBSQoSFlows)) OF AssociatedMBSQosFlowSetuporModifyRequestItem
 AssociatedMBSQosFlowSetupRequestList ::= SEQUENCE (SIZE(1..maxnoofMBSQoSFlows)) OF AssociatedMBSQosFlowSetupRequestItem
 EXTENSION NPN-PagingAssistanceInformation
 ProtocolExtensionContainer { {AssistanceDataForRecommendedCells-ExtIEs} } OPTIONAL,
 EXTENSION PagingAssisDataforCEcapabUE
 ProtocolExtensionContainer { {AssistanceDataForPaging-ExtIEs} } OPTIONAL,
 AssociatedMBSQosFlowSetuporModifyRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 AssistanceDataForRecommendedCells
 AssociatedMBSQosFlowSetupRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 PagingAttemptInformation
 AssistanceDataForRecommendedCells-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CRITICALITY ignore
 CRITICALITY ignore
 RecommendedCellsForPaging,
 AssistanceDataForPaging-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AssociatedMBSQosFlowSetuporModifyRequestItem ::= SEQUENCE {
AreaOfInterestTAIItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 QosFlowIdentifier,
 QosFlowIdentifier,
 QosFlowIdentifier,
 QosFlowIdentifier,
 AssociatedMBSQosFlowSetupRequestItem ::= SEQUENCE {
 AssistanceDataForRecommendedCells ::= SEQUENCE {
 { ID id-NPN-PagingAssistanceInformation { ID id-PagingAssisDataforCEcapabUE
 associatedUnicastQosFlowIdentifier
 associatedUnicastQosFlowIdentifier
 AssistanceDataForPaging ::= SEQUENCE {
 assistanceDataForRecommendedCells
 recommendedCellsForPaging
 pagingAttemptInformation iE-Extensions
 mBS-QosFlowIdentifier
 mBS-QosFlowIdentifier
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

AssociatedQosFlowList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF AssociatedQosFlowItem

```
~
 PRESENCE optional
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 AreaScopeofNeighCellsList ::= SEQUENCE (SIZE(1..maxnoofFregforMDT)) OF AreaScopeofNeighCellsItem
 { ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION AlternativeQoSParaSetIndex
 ProtocolExtensionContainer { { AreaScopeOfNeighCellsItem-ExtIEs} }
 ProtocolIE-SingleContainer { {AreaScopeOfMDT-EUTRA-ExtIEs} }
 ProtocolExtensionContainer { {AssociatedQosFlowItem-ExtIEs} }
 ProtocolIE-SingleContainer { {AreaScopeOfMDT-NR-ExtIEs} }
 AreaScopeOfNeighCellsItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 ENUMERATED {ul, dl, ...}
 AssociatedQosFlowItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 QosFlowIdentifier,
 CellBasedMDT-EUTRA
 AuthenticatedIndication ::= ENUMERATED {true, ...}
 AreaScopeOfMDT-EUTRA-ExtIEs NGAP-PROTOCOL-IES ::=
 NRFrequency Info,
 CellBasedMDT-NR,
 AreaScopeOfMDT-NR-ExtIEs NGAP-PROTOCOL-IES ::=
 PCIListForMDT
 TAIBasedMDT,
 TAIBasedMDT,
 TABasedMDT,
 TABasedMDT,
 AveragingWindow ::= INTEGER (0..4095, ...)
 AreaScopeOfNeighCellsItem ::= SEQUENCE
AssociatedQosFlowItem ::= SEQUENCE
 AreaScopeOfMDT-EUTRA ::= CHOICE
 AreaScopeOfMDT-NR ::= CHOICE
 gosFlowMappingIndication
 choice-Extensions
 gosFlowIdentifier
 choice-Extensions
 nrFrequencyInfo
 iE-Extensions
 pciListForMDT
 iE-Extensions
 cellBased
 cellBased
 tAIBased
 pLMNWide
 tAIBased
 pLMNWide
 tABased
 tABased
```

```
ProtocolExtensionContainer { { AvailableRANVisibleQoEMetrics-ExtIEs} } OPTIONAL,
 ProtocolIE-SingleContainer { {BroadcastCompletedAreaList-ExtIEs} }
 ProtocolIE-SingleContainer { {BroadcastCancelledAreaList-ExtIEs} }
 ProtocolIE-SingleContainer { { AreaScopeOfQMC-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 EmergencyAreaIDCancelledEUTRA,
 EmergencyAreaIDBroadcastEUTRA,
 EmergencyAreaIDCancelledNR,
 EmergencyAreaIDBroadcastNR,
 AvailableRANVisibleQoEMetrics-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ENUMERATED {true, ...}
 ENUMERATED {true, ...}
 CellIDBroadcastEUTRA,
 CellIDCancelledEUTRA,
 TAICancelledEUTRA,
 TAIBroadcastEUTRA,
 CellIDCancelledNR,
 CellIDBroadcastNR,
 BroadcastCancelledAreaList-ExtIEs NGAP-PROTOCOL-IES ::= {
 BroadcastCompletedAreaList-ExtIEs NGAP-PROTOCOL-IES ::=
 TAICancelledNR,
 TAIBroadcastNR,
 AreaScopeOfQMC-ExtIEs NGAP-PROTOCOL-IES ::= {
 PLMNAreaBasedQMC,
 AvailableRANVisibleQoEMetrics ::= SEQUENCE {
 TAIBasedQMC,
 BitRate ::= INTEGER (0..4000000000000 ...)
 CellBasedQMC,
 BroadcastCompletedAreaList ::= CHOICE {
 BroadcastCancelledAreaList ::= CHOICE {
 TABasedQMC,
 applicationLayerBufferLevelList
 emergencyAreaIDCancelledEUTRA
 emergencyAreaIDBroadcastEUTRA
 playoutDelayForMediaStartup
 emergencyAreaIDCancelledNR
 emergencyAreaIDBroadcastNR
AreaScopeOfQMC ::= CHOICE {
 cellIDBroadcastEUTRA
 cellIDCancelledEUTRA
 choice-Extensions
 tAlCancelledEUTRA
 cellIDCancelledNR
 choice-Extensions
 cellIDBroadcastNR
 choice-Extensions
 tAIBroadcastEUTRA
 tAICancelledNR
 tAIBroadcastNR
 pLMNAreaBased
 iE-Extensions
 cellBased
 tAIBased
 tABased
 М
```

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```
PRESENCE optional},
 PRESENCE optional}
 PRESENCE optional}
 OPTIONAL,
 OPTIONAL,
 OPTIONAL
 BluetoothMeasConfigNameList ::= SEQUENCE (SIZE(1...maxnoofBluetoothName)) OF BluetoothMeasConfigNameItem
 ENUMERATED {true, ...}
ProtocolExtensionContainer { { BluetoothMeasurementConfiguration-ExtIEs } }
 EXTENSION ExtendedSliceSupportList
 ProtocolExtensionContainer { { BluetoothMeasConfigNameItem-ExtIEs } }
 ProtocolExtensionContainer { {BroadcastPLMNItem-ExtIEs} } OPTIONAL,
 EXTENSION TAINSAGSupportList
 EXTENSION NPN-Support
BroadcastPLMNList ::= SEQUENCE (SIZE(1..maxnoofBPLMNs)) OF BroadcastPLMNItem
 BluetoothMeasurementConfiguration-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 BluetoothMeasConfigNameList
 BluetoothMeasConfigNameItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CRITICALITY reject
CRITICALITY ignore
 CRITICALITY reject
 BluetoothMeasConfig,
 BroadcastPLMNItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 BluetoothMeasurementConfiguration ::= SEQUENCE {
 STRING (SIZE (1..248))
 SliceSupportList,
 BluetoothMeasConfig::= ENUMERATED {setup,...}
 CancelAllWarningMessages ::= ENUMERATED {
 PLMNIdentity,
 BluetoothMeasConfigNameItem ::= SEQUENCE
 id-ExtendedTAISliceSupportList
 BluetoothName
 BurstArrivalTime ::= OCTET STRING
 BroadcastPLMNItem ::= SEQUENCE {
 CAG-ID ::= BIT STRING (SIZE(32))
 bluetoothMeasConfigNameList
 {ID id-NPN-Support
{ID id-ExtendedTAISliceSup
{ID id-TAINSAGSupportList
 ::= OCTET
 _tAISliceSupportList
 bluetoothMeasConfig
 iE-Extensions
 iE-Extensions
 iE-Extensions
 bluetoothName
 BluetoothName
 bt-rssi
 true,
```

```
ProtocolExtensionContainer { {CancelledCellsInEAI-EUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CancelledCellsInTAI-EUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CancelledCellsInEAI-NR-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CancelledCellsInTAI-NR-Item-ExtIEs} } OPTIONAL,
CancelledCellsInEAI-EUTRA ::= SEQUENCE (SIZE(1..maxnoofCellinEAI)) OF CancelledCellsInEAI-EUTRA-Item
 CancelledCellsInTAI-EUTRA ::= SEQUENCE (SIZE(1..maxnoofCellinTAI)) OF CancelledCellsInTAI-EUTRA-Item
 CancelledCellsInEAI-NR ::= SEQUENCE (SIZE(1..maxnoofCellinEAI)) OF CancelledCellsInEAI-NR-Item
 CancelledCellsInTAI-NR ::= SEQUENCE (SIZE(1..maxnoofCellinTAI)) OF CancelledCellsInTAI-NR-Item
 CancelledCellsInTAI-EUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CancelledCellsInEAI-EUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CancelledCellsInTAI-NR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CancelledCellsInEAI-NR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 NumberOfBroadcasts,
 NumberOfBroadcasts,
 NumberOfBroadcasts,
 NumberOfBroadcasts,
 CancelledCellsInEAI-EUTRA-Item ::= SEQUENCE {
 CancelledCellsInTAI-EUTRA-Item ::= SEQUENCE {
 CancelledCellsInEAI-NR-Item ::= SEQUENCE
 ::= SEQUENCE{
 EUTRA-CGI,
 EUTRA-CGI,
 NR-CGI,
 CancelledCellsInTAI-NR-Item
 numberOfBroadcasts
 numberOfBroadcasts
 numberOfBroadcasts
 numberOfBroadcasts
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

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```
OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {CandidateCellItem-ExtIEs} } OPTIONAL,
CandidateCellList ::= SEQUENCE (SIZE(1.. maxnoofCandidateCells)) OF CandidateCellItem
 ProtocolExtensionContainer { { CandidateCellID-ExtIEs}
 CandidatePCI,
ProtocolIE-SingleContainer { { CandidateCell-ExtIEs} }
 INTEGER (0..1007, ...),
INTEGER (0..3279165),
ProtocolExtensionContainer { { CandidatePCI-ExtIEs} }
 ProtocolIE-SingleContainer { {Cause-ExtIEs} }
 CandidateCellItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CandidateCellID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CandidatePCI-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CandidateCellID,
 CandidateCell-ExtIEs NGAP-PROTOCOL-IES ::=
 CauseRadioNetwork,
 CauseTransport,
 SEQUENCE{
 CandidateCell,
 CauseProtocol,
CauseMisc,
 {
NR-CGI,
 CauseNas,
 CandidateCellID::= SEQUENCE
 CandidatePCI::= SEQUENCE {
 CandidateCell::= CHOICE {
 CandidateCellItem ::=
 choice-Extensions
 choice-Extensions
 candidateNRARFCN
 candidateCellID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 candidateCell
 Cause ::= CHOICE
 candidatePCI
 radioNetwork
 candidatePCI
 candidateCGI
 transport
 protocol
 misc
 :
```

Cause-ExtIEs NGAP-PROTOCOL-IES ::= {

```
ho-failure-in-target-5GC-ngran-node-or-target-system,
 abstract-syntax-error-falsely-constructed-message,
 no-radio-resources-available-in-target-cell,
 control-processing-overload,
not-enough-user-plane-processing-resources,
 abstract-syntax-error-ignore-and-notify, message-not-compatible-with-receiver-state,
 release-due-to-ngran-generated-reason,
 release-due-to-5gc-generated-reason,
handover-cancelled,
 handover-desirable-for-radio-reason,
 inconsistent-remote-UE-NGAP-ID,
 resource-optimisation-handover,
 CauseRadioNetwork ::= ENUMERATED {
 abstract-syntax-error-reject,
 ...,
uE-not-in-PLMN-serving-area
 CauseProtocol ::= ENUMERATED {
 unknown-local-UE-NGAP-ID,
 time-critical-handover,
 authentication-failure,
 txnrelocoverall-expiry,
 tngrelocoverall-expiry,
 transfer-syntax-error,
 CauseMisc ::= ENUMERATED {
 ho-target-not-allowed,
 om-intervention,
unknown-PLMN-or-SNPN,
unspecified,
 CauseNas ::= ENUMERATED {
 successful-handover,
 tngrelocprep-expiry,
 cell-not-available,
 partial-handover,
 hardware-failure,
 unknown-targetID,
 normal-release,
 semantic-error,
 unspecified,
 unspecified,
 unspecified,
 deregister,
:
 :
```

reduce-load-in-serving-cell,

```
ProtocolExtensionContainer { {Cell-CAGInformation-ExtIEs} } OPTIONAL,
 encryption-and-or-integrity-protection-algorithms-not-supported,
 Cell-CAGInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 multiple-location-reporting-reference-ID-instances,
 ims-voice-eps-fallback-or-rat-fallback-triggered,
 ue-max-integrity-protected-data-rate-reason,
 up-confidentiality-protection-not-possible,
 ue-in-rrc-inactive-state-not-reachable,
 resources-not-available-for-the-slice,
 up-integrity-protection-not-possible,
 failure-in-radio-interface-procedure,
 release-due-to-cn-detected-mobility,
 ng-inter-system-handover-triggered,
 ng-intra-system-handover-triggered,
 NGRAN-CGI,
 multiple-PDU-session-ID-instances,
 interaction-with-other-procedure,
 CellCAGList,
 transport-resource-unavailable,
 multiple-gos-flow-ID-instances,
 Cell-CAGInformation ::= SEQUENCE {
 radio-connection-with-ue-lost,
 radio-resources-not-available,
 insufficient-ue-capabilities,
 rsn-not-available-for-the-up,
 n26-interface-not-available,
 release-due-to-pre-emption,
 CauseTransport ::= ENUMERATED {
 not-supported-5QI-value,
 invalid-gos-combination,
 redcap-ue-not-supported
 unknown-PDU-session-ID,
 cag-only-access-denied,
 xn-handover-triggered,
 ue-context-transfer,
 slice-not-supported,
 unkown-qos-flow-ID,
 npn-access-denied,
user-inactivity,
 iE-Extensions
 redirection,
 unspecified,
 cellCAGList
 nGRAN-CGI
```

```
ProtocolExtensionContainer { {CellIDCancelledEUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CellIDBroadcastEUTRA-Item-ExtIEs} } OPTIONAL,
 CellIDCancelledEUTRA ::= SEQUENCE (SIZE(1..maxnoofCellIDforWarning)) OF CellIDCancelledEUTRA-Item
 CellIDBroadcastEUTRA ::= SEQUENCE (SIZE(1...maxnoofCellIDforWarning)) OF CellIDBroadcastEUTRA-Item
 NumberOfBroadcasts,
ProtocolExtensionContainer { {CellIDCancelledNR-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CellIDBroadcastNR-Item-ExtIEs} } OPTIONAL,
 CellIDBroadcastNR ::= SEQUENCE (SIZE(1..maxnoofCellIDforWarning)) OF CellIDBroadcastNR-Item
 CellIDCancelledNR ::= SEQUENCE (SIZE(1..maxnoofCellIDforWarning)) OF CellIDCancelledNR-Item
CellCAGList ::= SEQUENCE (SIZE(1..maxnoofCAGSperCell)) OF CAG-ID
 CellIDBroadcastEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CellidCancelledEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CellIDCancelledNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CellIDBroadcastNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 NumberOfBroadcasts,
 CellIDBroadcastEUTRA-Item ::= SEQUENCE {
 eUTRA-CGI
 CellIDCancelledEUTRA-Item ::= SEQUENCE {
 EUTRA-CGI,
 ::= SEQUENCE {
NR-CGI,
 CelliDCancelledNR-Item ::= SEQUENCE {
 CellIDListForRestart ::= CHOICE
 CellIDBroadcastNR-Item
 numberOfBroadcasts
 numberOfBroadcasts
iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

```
OPTIONAL,
 CNTypeRestrictionsForEquivalent ::= SEQUENCE (SIZE(1..maxnoofEPLMNs)) OF CNTypeRestrictionsForEquivalentItem
 ENUMERATED {epc-forbidden, fiveGC-forbidden, ...},
ProtocolExtensionContainer { {CNTypeRestrictionsForEquivalentItem-ExtIEs} }
 ProtocolExtensionContainer { {CNAssistedRANTuning-ExtIEs} } OPTIONAL,
 ProtocolIE-SingleContainer { {CellIDListForRestart-ExtIEs} }
 OPTIONAL,
 ProtocolExtensionContainer { {CellType-ExtIEs} }
 CNTypeRestrictionsForEquivalentItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::={
 CellSize ::= ENUMERATED {verysmall, small, medium, large, ...}
 CEmodeBSupport-Indicator ::= ENUMERATED {supported,...}
 CNASSistedRANTuning-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CellIDListForRestart-ExtIEs NGAP-PROTOCOL-IES ::=
 CNTypeRestrictionsForEquivalentItem ::= SEQUENCE
EUTRA-CGIList,
 CellType-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 NR-CGIList,
 PLMNIdentity,
 CNsubgroupID ::= INTEGER (0..7, ...)
 CEmodeBrestricted ::= ENUMERATED {
 CNAssistedRANTuning ::= SEQUENCE {
 CellSize,
eUTRA-CGIListforRestart
 nR-CGIListforRestart
 expectedUEBehaviour
 CellType ::= SEQUENCE {
 choice-Extensions
 not-restricted,
 iE-Extensions
 iE-Extensions
 iE-Extensions
 plmnIdentity
 restricted,
 cellSize
 cn-Type
```

```
ProtocolExtensionContainer { {CompletedCellsInTAI-EUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CompletedCellsInEAI-EUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CompletedCellsInEAI-NR-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CompletedCellsInTAI-NR-Item-ExtIEs} } OPTIONAL,
 CompletedCellsInEAI-EUTRA ::= SEQUENCE (SIZE(1..maxnoofCellinEAI)) OF CompletedCellsInEAI-EUTRA-Item
 CompletedCellsInTAI-EUTRA ::= SEQUENCE (SIZE(1..maxnoofCellinTAI)) OF CompletedCellsInTAI-EUTRA-Item
 CompletedCellsInEAI-NR ::= SEQUENCE (SIZE(1..maxnoofCellinEAI)) OF CompletedCellsInEAI-NR-Item
 CompletedCellsInTAI-NR ::= SEQUENCE (SIZE(1..maxnoofCellinTAI)) OF CompletedCellsInTAI-NR-Item
 CompletedCellsInEAI-EUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CompletedCellsInTAI-EUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CompletedCellsInTAI-NR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CompletedCellsInEAI-NR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
CNTypeRestrictionsForServing ::= ENUMERATED {
 CompletedCellsInEAI-EUTRA-Item ::= SEQUENCE {
 CompletedCellsInTAI-EUTRA-Item ::= SEQUENCE{
 CompletedCellsInTAI-NR-Item ::= SEQUENCE{
 CompletedCellsInEAI-NR-Item ::= SEQUENCE
 CommonNetworkInstance ::= OCTET STRING
 EUTRA-CGI,
 epc-forbidden,
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 eUTRA-CGI
 :
```

```
PRESENCE optional },
 PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 optional
 PRESENCE
 PagingCauseIndicationForVoiceService
 OPTIONAL, OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EXTENSION ExtendedUEIdentityIndexValue
 EXTENSION UERadioCapabilityForPaging
 EXTENSION PEIPSassistanceInformation
 EXTENSION NR-PagingeDRXInformation
 ProtocolExtensionContainer { {CoreNetworkAssistanceInformationForInactive-ExtIEs} }
 MicoallPLMN
 ProtocolExtensionContainer { {COUNTValueForPDCP-SN12-ExtIEs} } OPTIONAL,
 EXTENSION
 EXTENSION
 ignore
 ignore
 ignore
 ignore
 ignore
 ignore
 PeriodicRegistrationUpdateTimer,
 CRITICALITY
 CRITICALITY
 CRITICALITY
 CRITICALITY
CRITICALITY
 CRITICALITY
 UEIdentityIndexValue,
 ExpectedUEBehaviour
 TAIListForInactive,
 MICOModeIndication
 CoreNetworkAssistanceInformationForInactive ::= SEQUENCE {
 ConfidentialityProtectionIndication ::= ENUMERATED {
 PagingDRX
 ID id-ExtendedUrlantityIndexValue
ID id-UERadioCapabilityForPaging
ID id-MicoAllPLMN
ID id-NR-PagingeDRXInformation
ID id-PagingCauseIndicationForVoiceService
ID id-PEIPSassistanceInformation
 ConfidentialityProtectionResult ::= ENUMERATED {
 INTEGER (0..4095),
INTEGER (0..1048575),
ConcurrentWarningMessageInd ::= ENUMERATED {
 ConfiguredTACIndication ::= ENUMERATED {
 ::= SEQUENCE {
 periodicRegistrationUpdateTimer
 uEIdentityIndexValue
 expectedUEBehaviour
 mICOModeIndication
 tAlListForInactive
 COUNTValueForPDCP-SN12
 not-performed,
 uESpecificDRX
 iE-Extensions
 hFN-PDCP-SN12
 iE-Extensions
 not-needed
 performed,
 preferred,
 pDCP-SN12
 required,
 true,
 true,
```

```
~
 PRESENCE mandatory
 CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE(1..maxnoofErrors)) OF CriticalityDiagnostics-IE-Item
 ProtocolExtensionContainer {{CriticalityDiagnostics-IE-Item-ExtIEs}} OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {COUNTValueForPDCP-SN18-ExtIEs} } OPTIONAL,
 ProtocolIE-SingleContainer { {CPTransportLayerInformation-ExtIEs} }
 TYPE EndpointIPAddressAndPort
 ProtocolExtensionContainer {{CriticalityDiagnostics-ExtIEs}}
 CriticalityDiagnostics-IE-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CriticalityDiagnostics-IE-List
 CRITICALITY reject
COUNTValueForPDCP-SN12-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CPTransportLayerInformation-ExtIEs NGAP-PROTOCOL-IES ::= {
 COUNTValueForPDCP-SN18-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CriticalityDiagnostics-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 TriggeringMessage
 TransportLayerAddress,
 ProcedureCode
 Criticality
 ::= SEQUENCE { INTEGER (0..262143),
 CriticalityDiagnostics-IE-Item ::= SEQUENCE
 INTEGER (0..16383),
 CoverageEnhancementLevel ::= OCTET STRING
 ::= CHOICE {
 ProtocolIE-ID,
 CriticalityDiagnostics ::= SEQUENCE {
 { ID id-EndpointIPAddressAndPort
 Criticality,
 TypeOfError,
 iEsCriticalityDiagnostics
 CPTransportLayerInformation
 procedureCriticality
 COUNTValueForPDCP-SN18
 triggeringMessage
 endpointIPAddress
 choice-Extensions
 iE-Extensions
 procedureCode
 iE-Extensions
 hFN-PDCP-SN18
 iECriticality
 iE-Extensions
 typeOfError
 pDCP-SN18
 iE-ID
```

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```
DataForwardingResponseDRBList := SEQUENCE (SIZE(1..maxnoofDRBs)) OF DataForwardingResponseDRBItem
 ProtocolExtensionContainer { {CellBasedMDT-EUTRA-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CellBasedMDT-NR-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {CellBasedQMC-ExtIEs} } OPTIONAL,
 CellIdListforMDT-EUTRA ::= SEQUENCE (SIZE(1..maxnoofCellIDforMDT)) OF EUTRA-CGI
 CellidListforMDT-NR ::= SEQUENCE (SIZE(1..maxnoofCellIDforMDT)) OF NR-CGI
 CellidListforQMC ::= SEQUENCE (SIZE(1..maxnoofCellIDforQMC)) OF NR-CGI
 CellBasedMDT-EUTRA-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CellBasedMDT-NR-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CellBasedQMC-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CellidistforMDT-EUTRA,
 CellidListforMDT-NR,
 DataForwardingNotPossible ::= ENUMERATED {
 CellIdListforQMC,
 DataCodingScheme ::= BIT STRING (SIZE(8))
 DataForwardingAccepted ::= ENUMERATED {
 data-forwarding-not-possible,
 CellBasedMDT-EUTRA::= SEQUENCE {
CellBasedMDT-NR::= SEQUENCE {
 data-forwarding-accepted,
 CellBasedQMC ::= SEQUENCE {
 cellIdListforMDT
 cellIdListforMDT
 cellIdListforQMC
 iE-Extensions
 iE-Extensions
 iE-Extensions
 О
--
```

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```
OPTIONAL,
 DataForwardingResponseERABList ::= SEQUENCE (SIZE(1..maxnoofE-RABs)) OF DataForwardingResponseERABListItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 iformation UPTransportLayerInformation,
ProtocolExtensionContainer { {DataForwardingResponseERABListItem-ExtIEs} }
 ProtocolExtensionContainer { {DAPSRequestInfo-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer {{DataForwardingResponseDRBItem-ExtIEs}}
 ProtocolExtensionContainer { {DAPSResponseInfoItem-ExtIEs} }
 ENUMBERATED {daps-ho-accepted, daps-ho-not-accepted, ...},
ProtocolExtensionContainer { { DAPSResponseInfo-ExtIEs} } o
 DAPSResponseInfoList ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DAPSResponseInfoltem
 UPTransportLayerInformation
 UPTransportLayerInformation
 ENUMERATED {daps-ho-required, ...},
 DataForwardingResponseDRBItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DAPSResponseInfoltem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 DAPSResponseInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DAPSRequestInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 DataForwardingResponseERABListItem ::= SEQUENCE { e-RAB-ID,
 DAPSResponseInfo,
DataForwardingResponseDRBItem ::= SEQUENCE {
 DAPSResponseInfoltem ::= SEQUENCE
 dLForwardingUP-TNLInformation
 dlForwardingUP-TNLInformation
 uLForwardingUP-TNLInformation
 DAPSResponseInfo ::= SEQUENCE {
 DRB-ID,
 DAPSRequestInfo ::= SEQUENCE {
 dapsresponseindicator
 dAPSResponseInfo
 iE-Extensions
 iE-Extensions
 dAPSIndicator
 iE-Extensions
 iE-Extension
 iE-Extensions
```

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```
PRESENCE optional },
 ProtocolExtensionContainer { { DL-CP-SecurityInformation-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {DRBsSubjectToStatusTransferItem-ExtIEs} } OPTIONAL,
 DRBsSubjectToStatusTransferList ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRBsSubjectToStatusTransferItem
DataForwardingResponseERABListItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DL-CP-SecurityInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DirectForwardingPathAvailability ::= ENUMERATED {
 DRBsSubjectToStatusTransferItem ::= SEQUENCE
 DL-NGU-TNLInformationReused ::= ENUMERATED {
 DL-CP-SecurityInformation ::= SEQUENCE {
 DL-NAS-MAC,
 DL-NAS-MAC ::= BIT STRING (SIZE (16))
 DRBStatusDL,
 DRB-ID,
DRBStatusUL,
 DRB-ID ::= INTEGER (1..32, ...)
 DelayCritical ::= ENUMERATED {
 DLForwarding ::= ENUMERATED
 dl-forwarding-proposed,
 direct-path-available,
 non-delay-critical,
 delay-critical,
 iE-Extensions
 iE-Extension
 dRBStatusUL
 dRBStatusDL
 dl-NAS-MAC
 true,
 :
```

```
OPTIONAL, OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolIE-SingleContainer { {DRBStatusDL-ExtIEs} }
 ProtocolIE-SingleContainer { {DRBStatusUL-ExtIEs} }
 ProtocolExtensionContainer { {DRBStatusDL12-ExtIEs} }
 COUNTValueForPDCP-SN18,
ProtocolExtensionContainer { {DRBStatusDL18-ExtIEs} }
 CP-SDUS BIT STRING (SIZE(1..2048))
ProtocolExtensionContainer { {DRBStatusUL12-ExtIES} }
 COUNTValueForPDCP-SN12,
 DRBStatusDL12-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DRBStatusDL18-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DRBStatusUL12-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 DRBStatusUL18,
 DRBStatusDL18,
 DRBStatusDL-ExtIEs NGAP-PROTOCOL-IES ::= {
 DRBStatusUL12,
 DRBStatusUL-ExtIEs NGAP-PROTOCOL-IES ::= {
 DRBStatusDL12,
 receiveStatusOfUL-PDCP-SDUs iE-Extension Protocol
 DRBStatusDL18 ::= SEQUENCE {
 DRBStatusUL12 ::= SEQUENCE {
 DRBStatusUL18 ::= SEQUENCE {
 DRBStatusUL ::= CHOICE
DRBStatusDL ::= CHOICE
 choice-Extensions
 choice-Extensions
 dRBStatusDL18
 dL-COUNTValue
 dRBStatusUL18
 uL-COUNTValue
 dRBStatusDL12
 dRBStatusUL12
 iE-Extension
 iE-Extension
```

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```
ニニニ
 ProtocolExtensionContainer { {EarlyStatusTransfer-TransparentContainer-ExtIEs} } OPTIONAL,
 PRESENCE optional
 optional
 PRESENCE optional PRESENCE optional
 OPTIONAL,
 _`
 OPTIONAL, OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EXTENSION ExtendedPacketDelayBudget
 EXTENSION ExtendedPacketDelayBudget EXTENSION ExtendedPacketDelayBudget
 PRESENCE optional
 OPTIONAL,
 OPTIONAL,
 DRBSTOQOSFlowsMappingList ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRBSTOQOSFlowsMappingItem
 ProtocolExtensionContainer { {DRBsToQosFlowsMappingItem-ExtIEs} }
 ProtocolExtensionContainer { {Dynamic5QIDescriptor-ExtIEs} }
 ProtocolExtensionContainer { {DRBStatusUL18-ExtIEs} }
 EarlyStatusTransfer-TransparentContainer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 BIT STRING (SIZE(1..131072))
 AssociatedQosFlowList,
COUNTValueForPDCP-SN18,
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY ignore
 Dynamic5QIDescriptor-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 The above IE shall be present in case of GBR QoS flow
 The above IE shall be present in case of GBR QoS flow
 EarlyStatusTransfer-TransparentContainer ::= SEQUENCE {
 MaximumDataBurstVolume
 PacketDelayBudget,
 ProcedureStageChoice,
 PrioritvLevelOos,
 DRBStatusUL18-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 PacketErrorRate,
 AveragingWindow
 DRB-ID,
 DelayCritical
 DRBsToQosFlowsMappingItem ::= SEQUENCE
 FiveQI
 { ID id-ExtendedPacketDelayBudget
{ ID id-CNPacketDelayBudgetDL
{ ID id-CNPacketDelayBudgetUL
 Dynamic5QIDescriptor ::= SEQUENCE {
 receiveStatusOfUL-PDCP-SDUs
 maximumDataBurstVolume
 associatedQosFlowList
 packetDelayBudget
 priorityLevelQos
 packetErrorRate
 averagingWindow
 procedureStage
 iE-Extensions
 iE-Extensions
 delayCritical
 iE-Extensions
uL-COUNTValue
 iE-Extension
 ы
 1
```

```
DRBsSubjectToEarlyStatusTransfer-List ::= SEQUENCE (SIZE (1.. maxnoofDRBs)) OF DRBsSubjectToEarlyStatusTransfer-Item
 EmergencyAreaIDBroadcastEUTRA ::= SEQUENCE (SIZE(1..maxnoofEmergencyAreaID)) OF EmergencyAreaIDBroadcastEUTRA-Item
 DRBStatusDL, ProtocolExtensionContainer { { DRBsSubjectToEarlyStatusTransfer-Item-ExtIEs} } OPTIONAL,
 EUTRA CompletedCellsInEAI-EUTRA, ProtocolExtensionContainer { {EmergencyAreaIDBroadcastEUTRA-Item-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolIE-SingleContainer { {ProcedureStageChoice-ExtIEs} }
 DRBsSubjectToEarlyStatusTransfer-List,
 ProtocolExtensionContainer { {FirstDLCount-ExtIEs} }
 DRBsSubjectToEarlyStatusTransfer-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 EmergencyAreaIDBroadcastEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EmergencyArealD,
 DRBsSubjectToEarlyStatusTransfer-Item ::= SEQUENCE
 ProcedureStageChoice-ExtIEs NGAP-PROTOCOL-IES ::=
 FirstDLCount-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 EmergencyAreaIDBroadcastEUTRA-Item ::= SEQUENCE {
 EmergencyAreaID ::= OCTET STRING (SIZE(3))
 FirstDLCount,
 dRBsSubjectToEarlyStatusTransfer
ProcedureStageChoice ::= CHOICE {
 completedCellsInEAI-EUTRA
 FirstDLCount ::= SEQUENCE {
 EDT-Session ::= ENUMERATED
 choice-Extensions
 emergencyArealD
 first-dl-count
 iE-Extensions
 iE-Extension
 iE-Extension
 firstDLCOUNT
 true,
```

```
EmergencyAreaIDCancelledEUTRA ::= SEQUENCE (SIZE(1..maxnoofEmergencyAreaID)) OF EmergencyAreaIDCancelledEUTRA-Item
EmergencyAreaIDBroadcastNR ::= SEQUENCE (SIZE(1..maxnoofEmergencyAreaID)) OF EmergencyAreaIDBroadcastNR-Item
 EmergencyAreaIDCancelledNR ::= SEQUENCE (SIZE(1..maxnoofEmergencyAreaID)) OF EmergencyAreaIDCancelledNR-Item
 EUTRA CancelledCellsInEAI-EUTRA, ProtocolExtensionContainer { {EmergencyAreaIDCancelledEUTRA-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {EmergencyAreaIDBroadcastNR-Item-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {EmergencyAreaIDCancelledNR-Item-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EmergencyArealD
 ProtocolExtensionContainer { {EmergencyFallbackIndicator-ExtIEs} }
 EmergencyAreaIDList ::= SEQUENCE (SIZE(1..maxnoofEmergencyAreaID)) OF EmergencyAreaID
 EmergencyFallbackRequestIndicator,
 EmergencyAreaIDListForRestart ::= SEQUENCE (SIZE(1..maxnoofEAlforRestart)) OF
 EmergencyAreaIDCancelledEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EmergencyServiceTargetCN
 EmergencyAreaIDBroadcastNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EmergencyAreaIDCancelledNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION
 EmergencyFallbackIndicator-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CompletedCellsInEAI-NR,
 CancelledCellsInEAI-NR,
 EmergencyArealD,
 ::= SEQUENCE {
 EmergencyArealD,
 EmergencyArealD,
 EmergencyAreaIDBroadcastNR-Item ::= SEQUENCE {
 ::= SEQUENCE
 SEQUENCE {
 emergencyFallbackRequestIndicator
 EmergencyAreaIDCancelledEUTRA-Item
 EmergencyAreaIDCancelledNR-Item
 EmergencyFallbackIndicator ::=
 cancelledCellsInEAI-EUTRA
 emergencyServiceTargetCN
 completedCellsInEAI-NR
 cancelledCellsInEAI-NR
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

```
PortNumber,
ProtocolExtensionContainer { { EndpointIPAddressAndPort-ExtIEs} } OPTIONAL
 BIT STRING (SIZE(20)),
BIT STRING (SIZE(28)),
BIT STRING (SIZE(18)),
BIT STRING (SIZE(21)),
ProtocolIE-SingleContainer { { ENB-ID-ExtIEs} }
 EquivalentPLMNs ::= SEQUENCE (SIZE(1..maxnoofEPLMNs)) OF PLMNIdentity
 Enhanced-CoverageRestriction ::= ENUMERATED {restricted, ... }
 EndpointIPAddressAndPort-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
EmergencyFallbackRequestIndicator ::= ENUMERATED {
 EN-DCSONConfigurationTransfer ::= OCTET STRING
 endpointIPAddress TransportLayerAddress,
 Extended-ConnectedTime ::= INTEGER (0..255)
 EmergencyServiceTargetCN ::= ENUMERATED {
 ENB-ID-ExtIES NGAP-PROTOCOL-IES ::= {
 EndpointIPAddressAndPort ::=SEQUENCE
 EPS-TAC ::= OCTET STRING (SIZE(2))
 emergency-fallback-requested,
 EndIndication ::= ENUMERATED {
 further-data-exists,
 EPS-TAI ::= SEQUENCE {
 short-macroENB-ID
 long-macroENB-ID choice-Extensions
 no-further-data,
 ENB-ID ::= CHOICE
 iE-Extensions
 macroENB-ID
 homeENB-ID
 portNumber
 fiveGC,
 epc,
 :
```

```
CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional} (CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional),
 ProtocolExtensionContainer { {EUTRA-PagingeDRXInformation-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EUTRA-CGIListForWarning ::= SEQUENCE (SIZE(1..maxnoofCellIDforWarning)) OF EUTRA-CGI
 ProtocolExtensionContainer { {EUTRA-CGI-ExtIEs} } OPTIONAL,
 DLForwarding FrotocolExtensionContainer { {E-RABInformationItem-ExtIEs}
 E-RABInformationList ::= SEQUENCE (SIZE(1..maxnoofE-RABS)) OF E-RABInformationItem
 ProtocolExtensionContainer { {EPS-TAI-ExtIEs} } OPTIONAL,
 EUTRA-CGIList ::= SEQUENCE (SIZE(1..maxnoofCellsinngeNB)) OF EUTRA-CGI
 EUTRA-PagingeDRXInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 E-RABInformationItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 EUTRA-Paging-Time-Window
 EUTRA-PagingeDRXInformation ::= SEQUENCE {
 eUTRA-paging-eDRX-Cycle
 EUTRACellIdentity,
 EUTRA-CGI-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EPS-TAI-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 EUTRACellIdentity ::= BIT STRING (SIZE(28))
 PLMNIdentity,
PLMNIdentity,
 ::= SEQUENCE {
 E-RAB-ID ::= INTEGER (0..15, ...)
 E-RAB-ID,
 ID id-SourceNodeTNLAddrInfo
 EPS-TAC,
 {ID id-SourceTNLAddrInfo
 eUTRA-paging-Time-Window
 EUTRA-CGI ::= SEQUENCE
 eUTRACellIdentity
 E-RABInformationItem
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 dLForwarding
 pLMNIdentity
 pLMNIdentity
 e-RAB-ID
 ePS-TAC
 :
 :
```

```
OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {ExpectedUEActivityBehaviour-ExtIEs} } OPTIONAL,
 OPTIONAL, OPTIONAL,
 OPTIONAL,
 SourceOfUEActivityBehaviourInformation
 ExpectedActivityPeriod ::= INTEGER (1..30 | 40 | 50 | 60 | 80 | 100 | 120 | 150 | 180 | 181, ...)
 ExpectedIdlePeriod ::= INTEGER (1..30 | 40 | 50 | 60 | 80 | 100 | 120 | 150 | 180 | 181, ...)
 ExpectedActivityPeriod
 ExpectedIdlePeriod
 EUTRAintegrityProtectionAlgorithms ::= BIT STRING (SIZE(16, ...))
 ExpectedUEActivityBehaviour-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 ExpectedUEActivityBehaviour
 sec15, sec30, sec60, sec90, sec120, sec180, long-time,
 EUTRAencryptionAlgorithms ::= BIT STRING (SIZE(16, ...))
 ExpectedHOInterval ExpectedUEMobility
 sourceOfUEActivityBehaviourInformation
 EUTRA-Paging-Time-Window ::= ENUMERATED {
 stop-ue-presence-in-area-of-interest,
 ExpectedUEActivityBehaviour ::= SEQUENCE
EUTRA-Paging-eDRX-Cycle ::= ENUMERATED {
 hfhalf, hf1, hf2, hf4, hf6,
 hf8, hf10, hf12, hf14, hf16,
 hf32, hf64, hf128, hf256,
 cancel-location-reporting-for-the-ue,
 ue-presence-in-area-of-interest,
 ExpectedHOInterval ::= ENUMERATED {
 ExpectedUEBehaviour ::= SEQUENCE {
 s11, s12, s13, s14, s15, s16,
 expectedUEActivityBehaviour
 stop-change-of-serve-cell,
 EventType ::= ENUMERATED {
 expectedActivityPeriod
 change-of-serve-cell,
 s1, s2, s3, s4, s5, s6, s7, s8, s9, s10,
 expectedIdlePeriod
 expectedUEMobility
 expectedHOInterval
 iE-Extensions
```

```
ExpectedUEMovingTrajectory ::= SEQUENCE (SIZE(1..maxnoofCellsUEMovingTrajectory)) OF ExpectedUEMovingTrajectoryItem
 RANNodeNameUTF8String ProtocolExtensionContainer { { Extended-RANNodeName-ExtIES } } OPTIONAL, ...
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { Extended-AMFName-ExtIEs } } OPTIONAL,
 INTEGER (0..4095)
ProtocolExtensionContainer { {ExpectedUEMovingTrajectoryItem-ExtIEs} }
 ProtocolExtensionContainer { {ExpectedUEBehaviour-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ExpectedUEMovingTrajectoryItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ExpectedUEMovingTrajectory
 RANNodeNameVisibleString
 BIT STRING (SIZE(8, ...)),
 Extended-RANNodeName-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ExpectedUEBehaviour-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 Extended-AMFName-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 ExtendedPacketDelayBudget ::= INTEGER (1..65535, ...)
 AMFNameVisibleString
 AMFNameUTF8String
 ExtendedRATRestrictionInformation ::= SEQUENCE {
 ExpectedUEMovingTrajectoryItem ::= SEQUENCE {
 nGRAN-CGI
 ::= SEQUENCE {
 ::= SEQUENCE {
 ExpectedUEMobility ::= ENUMERATED
expectedUEMovingTrajectory
 rANNodeNameVisibleString
 primaryRATRestriction
 rANNodeNameUTF8String
 aMFNameVisibleString
 aMFNameUTF8String iE-Extensions
 timeStayedInCell
 Extended-RANNodeName
 iE-Extensions
 iE-Extensions
 iE-Extensions
 Extended-AMFName
 stationary,
 mobile,
```

secondaryRATRestriction

iE-Extensions

.ion BIT STRING (SIZE(8, ...)),
ProtocolExtensionContainer { {ExtendedRATRestrictionInformation-ExtIEs} } OPTIONAL,

```
TimeToTrigger,
ProtocolExtensionContainer { { EventLlLoggedMDTConfig-ExtIEs} } OPTIONAL,
 ProtocolIE-SingleContainer { { MeasurementThresholdL1LoggedMDT-ExtIES} }
 ProtocolExtensionContainer { { FailureIndication-ExtIEs} } OPTIONAL,
 ExtendedSliceSupportList ::= SEQUENCE (SIZE(1..maxnoofExtSliceItems)) OF SliceSupportItem
 ProtocolIE-SingleContainer { { EventTrigger-ExtIEs} }
ExtendedRATRestrictionInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 {\tt MeasurementThresholdL1LoggedMDT},
 MeasurementThresholdLlLoggedMDT-ExtIEs NGAP-PROTOCOL-IES ::= {
 EventL1LoggedMDTConfig-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ::= INTEGER (4096..65535)
 ENUMERATED {true, ...},
 EventL1LoggedMDTConfig,
 ExtendedUEIdentityIndexValue ::= BIT STRING (SIZE(16))
 UERLFReportContainer,
 Threshold-RSRP,
 Threshold-RSRQ,
 MeasurementThresholdLlLoggedMDT ::= CHOICE {
 Hysteresis,
 EventTrigger-ExtIEs NGAP-PROTOCOL-IES ::=
 EventL1LoggedMDTConfig ::= SEQUENCE {
 FailureIndication ::= SEQUENCE {
 eventL1LoggedMDTConfig
 uERLFReportContainer
 EventTrigger::= CHOICE
 choice-Extensions
 choice-Extensions
 threshold-RSRP
 threshold-RSRQ
 outOfCoverage
 iE-Extensions
 timeToTrigger
 iE-Extensions
 llThreshold
 hysteresis
 ExtendedRNC-ID
 ſΞų
```

```
OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 NetworkRelay FiveGProSeLayer3UEtoNetworkRelay
teUE FiveGProSeLayer2RemoteUE
ProtocolExtensionContainer { {FiveG-ProSeAuthorized-ExtIEs} }
 FiveGProSeLayer2UEtoNetworkRelay
 FiveGProSeDirectCommunication
 FiveGProSePC5QoSFlowList,
 FiveGProSeDirectDiscovery
 FiveG-ProSeAuthorized-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
FailureIndication-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 BitRate
 FiveGProSeLayer2UEtoNetworkRelay ::= ENUMERATED {
 FiveGProSeLayer3UEtoNetworkRelay ::= ENUMERATED {
 FiveGProSeDirectCommunication ::= ENUMERATED {
 FiveG-ProSePC5QoSParameters ::= SEQUENCE {
 FiveGProSeLayer2RemoteUE ::= ENUMERATED {
 FiveGProSeDirectDiscovery ::= ENUMERATED
 fiveGProSepc5QoSFlowList fiveGProSepc5LinkAggregateBitRates
 fiveGProSeLayer3UEtoNetworkRelay
 fiveGProSeLayer2UEtoNetworkRelay
 FiveG-ProSeAuthorized ::= SEQUENCE
 fiveGProSeDirectCommunication
 fiveGProSeDirectDiscovery
 fiveGProSeLayer2RemoteUE
 not-authorized,
 not-authorized,
 not-authorized,
 not-authorized,
 not-authorized,
 iE-Extensions
 authorized,
 authorized,
 authorized,
 authorized,
 authorized,
 :
```

```
OPTIONAL,
 ForbiddenAreaInformation ::= SEQUENCE (SIZE(1.. maxnoofEPLMNsPlusOne)) OF ForbiddenAreaInformation-Item
 ProtocolExtensionContainer { { FiveGProSePC5FlowBitRates-ExtIEs} } OPTIONAL,
 OPTIONAL,
 FiveGProSePC5QoSFlowList ::= SEQUENCE (SIZE(1...maxnoofPC5QoSFlows)) OF FiveGProSePC5QoSFlowItem
ProtocolExtensionContainer { { FiveG-ProSePC5QoSParameters-ExtIEs} }
 ProtocolExtensionContainer { { FiveGProSePC5QoSFlowItem-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {FiveG-S-TMSI-ExtIEs} }
 FiveG-ProSePC50oSParameters-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 FiveGProSePC5QoSFlowItem-ExtIES NGAP-PROTOCOL-EXTENSION ::= {
 FiveGProSePC5FlowBitRates-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 FiveGProSePC5FlowBitRates
 FiveG-S-TMSI-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 BitRate,
 BitRate,
 ForbiddenAreaInformation-Item ::= SEQUENCE {
 FiveGProSePC5FlowBitRates ::= SEQUENCE {
 FiveGProSePC5QoSFlowItem ::= SEQUENCE {
 FiveQI
 Range
 PLMNIdentity,
 FiveG-TMSI ::= OCTET STRING (SIZE(4))
 fiveGproSeguaranteedFlowBitRate
 FiveG-TMSI,
 AMFPointer
 AMFSetID,
 fiveGproSemaximumFlowBitRate
 FiveQI ::= INTEGER (0..255, ...)
 fiveGproSepc5FlowBitRates
 FiveG-S-TMSI ::= SEQUENCE {
 fiveGproSerange
 iE-Extensions
 iE-Extensions
iE-Extensions
 fiveGproSepQI
 iE-Extensions
 pLMNIdentity
 aMFPointer
 fiveG-TMSI
 aMFSetID
```

```
CRITICALITY ignore EXTENSION AlternativeQoSParaSetList PRESENCE optional
 OPTIONAL
 OPTIONAL
 ProtocolExtensionContainer { {ForbiddenAreaInformation-Item-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { FromEUTRANtoNGRAN-ExtIEs} }
 ProtocolExtensionContainer { { FromNGRANtoEUTRAN-ExtIEs} }
 ProtocolExtensionContainer { {GBR-QosInformation-ExtIEs} }
 ForbiddenAreaInformation-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ForbiddenTACs ::= SEQUENCE (SIZE(1..maxnoofForbTACs)) OF TAC
 GBR-QosInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 FromEUTRANtoNGRAN-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 FromNGRANtoEUTRAN-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 IntersystemSONNGRANnodeID,
 IntersystemSONNGRANnodeID,
 NotificationControl
 IntersystemSONeNBID,
 IntersystemSONeNBID,
 PacketLossRate
 PacketLossRate
 PLMNIdentity,
 BitRate,
 BitRate,
 BitRate,
 BitRate,
 ForbiddenTACs,
 { ID id-AlternativeQoSParaSetList
 FromEUTRANtoNGRAN ::= SEQUENCE {
 FromNGRANtoEUTRAN ::= SEQUENCE {
 GBR-QosInformation ::= SEQUENCE
 GlobalCable-ID ::= OCTET STRING
 Globalenb-ID ::= SEQUENCE {
 guaranteedFlowBitRateDL
 maximumPacketLossRateDL
 {	t guaranteedFlowBitRateUL}
 maximumPacketLossRateUL
 maximumFlowBitRateDL
 maximumFlowBitRateUL
 notificationControl
 targetNGRANnodeID
 sourceNGRANnodeID
 iE-Extensions
 iE-Extensions
 iE-Extensions
forbiddenTACs
 iE-Extensions
 pLMNidentity
 targeteNBID
 ט
 !
```

OPTIONAL,

ENB-ID,
ProtocolExtensionContainer { {GlobalENB-ID-ExtIEs} }

eNB-ID

```
OPTIONAL, OPTIONAL,
 N3IWF-ID, ProtocolExtensionContainer { {GlobalN3IWF-ID-ExtIEs} } OPTIONAL,
 NgENB-ID, ProtocolExtensionContainer { {GlobalNgENB-ID-ExtIEs} } OPTIONAL,
 GNB-ID,
ProtocolExtensionContainer { {GlobalGNB-ID-ExtIEs} } OPTIONAL,
 LineType
ProtocolExtensionContainer { {GlobalLine-ID-ExtIEs} }
 GlobalNgENB-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 GlobalN3IWF-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 GlobalLine-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 GlobalGNB-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
Globalenb-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 GlobalLineIdentity,
 GlobalN3IWF-ID ::= SEQUENCE {
 pLMNIdentity PLMNIdentity,
 GlobalLineIdentity ::= OCTET STRING
 GlobalLine-ID ::= SEQUENCE
 globalLineIdentity
 gNB-ID
iE-Extensions
 n3IWF-ID
 iE-Extensions
 ngENB-ID
iE-Extensions
 lineType
```

```
_;
 PRESENCE mandatory } | PRESENCE mandatory PRESENCE mandatory
 ProtocolExtensionContainer { { GlobalW-AGF-ID-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { { GlobalTNGF-ID-ExtIEs} } OPTIONAL,
 TWIF-ID,
ProtocolExtensionContainer { { GlobalTWIF-ID-ExtIEs} } OPTIONAL,
 GlobalN3IWF-ID,
ProtocolIE-SingleContainer { {GlobalRANNodeID-ExtIEs} }
 TYPE GlobalTNGF-ID
TYPE GlobalTWIF-ID
TYPE GlobalW-AGF-ID
 GlobalW-AGF-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CRITICALITY reject
CRITICALITY reject
 CRITICALITY reject
 GlobalTNGF-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 GlobalTWIF-ID-ExtIES NGAP-PROTOCOL-EXTENSION ::=
 GlobalRANNodeID-ExtIEs NGAP-PROTOCOL-IES ::= {
 GlobalNgENB-ID,
 PLMNIdentity,
 GlobalGNB-ID,
 W-AGF-ID,
 PLMNIdentity,
 TNGF-ID,
 GlobalW-AGF-ID ::= SEQUENCE {
 GlobalTWIF-ID ::= SEQUENCE {
GlobalRANNodeID ::= CHOICE
 { ID id-GlobalTNGF-ID { ID id-GlobalTWIF-ID } { ID id-GlobalW-AGF-ID }
 globalN3IWF-ID choice-Extensions
 globalNgENB-ID
 tWIF-ID
iE-Extensions
 iE-Extensions
 iE-Extensions
 pLMNIdentity
 globalGNB-ID
 pLMNIdentity
 W-AGF-ID
```

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```
PRESENCE optional
PRESENCE optional
PRESENCE optional
 PRESENCE optional
 PRESENCE optional
 EXTENSION UPTransportLayerInformationList
 DataForwardingResponseERABList
 EXTENSION QOSFlowPerTNLInformationList
 EXTENSION UPTransportLayerInformation
 EXTENSION QOSFlowListWithCause
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {HandoverCommandTransfer-ExtIEs} } OPTIONAL,
 EXTENSION
 ProtocolExtensionContainer { {GTPTunnel-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {GUAMI-ExtIEs} } OPTIONAL,
 ignore
 CRITICALITY reject
 reject
 ignore
 CRITICALITY ignore
 DataForwardingResponseDRBList
 CRITICALITY
CRITICALITY
 UPTransportLayerInformation
 QosFlowToBeForwardedList
 TransportLayerAddress,
 { ID id-AdditionalDLForwardingUPTNLInformation { ID id-ULForwardingUP-TNLInformation { ID id-AdditionalULForwardingUPTNLInformation { ID id-DataForwardingResponseERABList { ID id-QosFlowFailedToSetupList
 GTPTunnel-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 GUAMIType ::= ENUMERATED {native, mapped, ...}
 GTP-TEID,
 GUAMI-EXTIES NGAP-PROTOCOL-EXTENSION ::=
GNB-ID-ExtIES NGAP-PROTOCOL-IES ::= {
 PLMNIdentity,
 HandoverCommandTransfer ::= SEQUENCE
 AMFRegionID,
 GTP-TEID ::= OCTET STRING (SIZE(4))
 AMFPointer,
 dLForwardingUP-TNLInformation
 AMFSetID,
 dataForwardingResponseDRBList
 gosFlowToBeForwardedList
 HandoverFlag ::= ENUMERATED
 transportLayerAddress
 GTPTunnel ::= SEQUENCE {
 GUAMI ::= SEQUENCE
 iE-Extensions
 iE-Extensions
 iE-Extensions
 pLMNIdentity
 aMFRegionID
 aMFPointer
 aMFSetID
 GTP-TEID
```

```
PRESENCE optional
 PRESENCE optional },
 PRESENCE optional }|
PRESENCE optional }|
 PRESENCE optional }
 PRESENCE optional }
 PRESENCE optional }
 PRESENCE optional
 EXTENSION AdditionalDLUPTNLInformationForHOList
 OPTIONAL,
 OPTIONAL,
 EXTENSION UPTransportLayerInformationList
 EXTENSION DataForwardingResponseERABList
 EXTENSION RedundantPDUSessionInformation
 EXTENSION UPTransportLayerInformation
 EXTENSION UPTransportLayerInformation
 ProtocolExtensionContainer { {HandoverPreparationUnsuccessfulTransfer-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {HandoverResourceAllocationUnsuccessfulTransfer-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EXTENSION MBS-SupportIndicator
 CRITICALITY ignore EXTENSION GlobalRANNodeID
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {HandoverRequestAcknowledgeTransfer-ExtIEs} }
 ProtocolExtensionContainer { { HandoverRequiredTransfer-ExtIEs} }
 DirectForwardingPathAvailability
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY reject
 HandoverPreparationUnsuccessfulTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CRITICALITY ignore
 ignore
 CRITICALITY ignore
 HandoverRequestAcknowledgeTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 QosFlowListWithDataForwarding,
 DataForwardingResponseDRBList
 UPTransportLayerInformation,
 CRITICALITY
 UPTransportLayerInformation
 HandoverResourceAllocationUnsuccessfulTransfer ::= SEQUENCE {
 QosFlowListWithCause
 HandoverRequiredTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 HandoverPreparationUnsuccessfulTransfer ::= SEQUENCE {
 CriticalityDiagnostics
 SecurityResult
 ID id-AdditionalDLUPTNLInformationForHOList
ID id-ULForwardingUP-TNLInformation
ID id-AdditionalULForwardingUPTNLInformation
ID id-DataForwardingResponseERABList
 HandoverRequestAcknowledgeTransfer ::= SEQUENCE {
 ID id-RedundantDL-NGU-UP-TNLInformation ID id-UsedRSNInformation
 HandoverRequiredTransfer ::= SEQUENCE {
 directForwardingPathAvailability
 dLForwardingUP-TNLInformation
 dataForwardingResponseDRBList
 { ID id-MBS-SupportIndicator
 dL-NGU-UP-TNLInformation
 qosFlowSetupResponseList
 qosFlowFailedToSetupList
 ID id-GlobalRANNodeID
 criticalityDiagnostics
handover-preparation,
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

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 to the value "Inter System ping-pong" OPTIONAL,
 -- The above IE shall be present if the Handover Report Type IE is set to the value "HO to wrong cell"
 ENUMERATED {ho-too-early, ho-to-wrong-cell, intersystem-ping-pong, ...},
 OPTIONAL, OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
HandoverResourceAllocationUnsuccessfulTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 -- The above IE shall be present if the Handover Report Type IE is set
 : UERLFReportContainer ProtocolExtensionContainer { { HOReport-ExtIEs} }
 BIT STRING (SIZE(16))
 MobilityInformation
 INTEGER (0..30)
 HOReport-ExtIES NGAP-PROTOCOL-EXTENSION ::= {
 NGRAN-CGI,
NGRAN-CGI,
NGRAN-CGI
 EUTRA-CGI
 Cause,
 IABNodeIndication ::= ENUMERATED {
 IAB-Authorized ::= ENUMERATED {
 IAB-Supported ::= ENUMERATED {
 HandoverType ::= ENUMERATED {
 HFCNode-ID ::= OCTET STRING
 reestablishmentcellCGI
 uERLFReportContainer
 targetcellinE-UTRAN
 mobilityInformation
 handoverReportType
 HOReport::= SEQUENCE {
 sourcecellC-RNTI
 fivegs-to-utran
 not-authorized,
 fivegs-to-eps,
 iE-Extensions
 handoverCause
 targetcellCGI
 sourcecellCGI
 eps-to-5gs,
 authorized,
 Hysteresis ::=
 intra5gs,
 true,
 true,
 I --
```

```
ProtocolExtensionContainer { {InfoOnRecommendedCellsAndRANNodesForPaging-ExtIES} } OPTIONAL,
 The above IE shall be present if the Measurements to Activate IE has the fourth bit set to "1"
 to "1"
 to "1"
 The above IE shall be present if the Measurements to Activate IE has the first bit set to "1"
 to "1"
 The above IE shall be present if the Measurements to Activate IE has the third bit set
 The above IE shall be present if the Measurements to Activate IE has the fifth bit set
 The above IE shall be present if the Measurements to Activate IE has the sixth bit set
 OPTIONAL, OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 InfoOnRecommendedCellsAndRANNodesForPaging-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 BluetoothMeasurementConfiguration
 WLANMeasurementConfiguration
 MeasurementsToActivate,
 RecommendedRANNodesForPaging,
 RecommendedCellsForPaging,
 MDT-Location-Info
 M7Configuration
 M1Configuration
 M4Configuration
 M5Configuration
 M6Configuration
 InfoOnRecommendedCellsAndRANNodesForPaqing ::= SEQUENCE {
 IntendedNumberOfPagingAttempts ::= INTEGER (1..16, ...)
 IntegrityProtectionIndication ::= ENUMERATED {
 IntegrityProtectionResult ::= ENUMERATED {
 InterfacesToTrace ::= BIT STRING (SIZE(8))
IMSVoiceSupportIndicator ::= ENUMERATED
 bluetoothMeasurementConfiguration
 IndexToRFSP ::= INTEGER (1..256, ...)
 wLANMeasurementConfiguration
 recommendRANNodesForPaging
 recommendedCellsForPaging
 ImmediateMDTNr ::= SEQUENCE {
 measurementsToActivate
 mDT-Location-Info
 mlConfiguration
 m4Configuration
 m6Configuration
 m7Configuration
 m5Configuration
 not-supported,
 iE-Extensions
 not-performed,
 not-needed
 performed,
 supported
 preferred
 reguired,
```

```
OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { IntersystemSONConfigurationTransfer-ExtIEs} }
 ProtocolExtensionContainer { { InterSystemFailureIndication-ExtIEs} }
 ProtocolIE-SingleContainer { { IntersystemSONTransferType-ExtIEs}
 ProtocolExtensionContainer { { IntersystemSONNGRANnodeID-ExtIEs} }
 ProtocolExtensionContainer { { ImmediateMDTNr-ExtIEs} } OPTIONAL,
 EPS-TAI,
ProtocolExtensionContainer { { IntersystemSONeNBID-ExtIEs} }
OPTIONAL,
SensorMeasurementConfiguration
 IntersystemSONConfigurationTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 InterSystemFailureIndication-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 OPTIONAL,
 IntersystemSONTransferType,
 IntersystemSONInformation,
 IntersystemSONeNBID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 IntersystemSONTransferType-ExtIEs NGAP-PROTOCOL-IES ::=
 FromEUTRANtoNGRAN,
 FromNGRANtoEUTRAN
 UERLFReportContainer
 IntersystemSONConfigurationTransfer ::= SEQUENCE {
 ImmediateMDTNr-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 InterSystemFailureIndication ::= SEQUENCE {
 IntersystemSONNGRANnodeID ::= SEQUENCE {
 GlobalRANNodeID, TAI,
 IntersystemSONTransferType ::= CHOICE {
sensorMeasurementConfiguration
 intersystemSONInformation
 uERLFReportContainer
 fromEUTRANtoNGRAN
 fromNGRANtoEUTRAN
 choice-Extensions
 globalRANNodeID
 selectedEPSTAI
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 selectedTAI
```

```
PRESENCE mandatory } |
 TYPE IntersystemSONInformationRequest
 TYPE IntersystemSONInformationReply
 ProtocolExtensionContainer { { IntersystemCellActivationRequest-ExtIEs} } OPTIONAL,
 ProtocolIE-SingleContainer { { IntersystemSONInformationRequest-ExtIEs} }
 onReport IntersystemSONInformationReport,
ProtocolIE-SingleContainer { { IntersystemSONInformation-ExtIEs} }
 CellsToActivateList ::= SEQUENCE (SIZE(1..maxnoofCellsinNGRANNode)) OF NGRAN-CGI
 CRITICALITY ignore
 IntersystemCellActivationRequest-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 IntersystemCellActivationRequest,
 IntersystemResourceStatusRequest,
 IntersystemSONInformationRequest-ExtIEs NGAP-PROTOCOL-IES ::= {
IntersystemSONNGRANnodeID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 ReportCharacteristics,
 INTEGER (0..16384, ...),
 CellsToActivateList,
 ReportingSystem,
 IntersystemCellActivationRequest ::= SEQUENCE {
 IntersystemResourceStatusRequest ::= SEQUENCE {
 { ID id-IntersystemSONInformationRequest { ID id-IntersystemSONInformationReply
 IntersystemSONInformationRequest ::= CHOICE
 ReportType,
 INTER SYSTEM SON INFORMATION REQUEST
 Inter System Resource Status Request
 IntersystemSONInformation ::= CHOICE {
 intersystemSONInformationReport
 reportCharacteristics
 nGRAN-CellActivation
 cellsToActivateList
 choice-Extensions
 choice-Extensions
 reportingSystem
 resourceStatus
 iE-Extensions
 activationID
 reportType
 | |
 ŀ
 |
```

```
ProtocolExtensionContainer { { IntersystemResourceStatusRequest-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {EUTRAN-CellToReportItem-ExtIEs} } OPTIONAL,
 EUTRAN-CellToReportList ::= SEQUENCE (SIZE(1...maxnoofReportedCells)) OF EUTRAN-CellToReportItem
 NGRAN-CellToReportList ::= SEQUENCE (SIZE(1.. maxnoofReportedCells)) OF NGRAN-CellToReportItem
 ProtocolIE-SingleContainer { { ReportingSystem-ExtIEs}}
 IntersystemResourceStatusRequest-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EUTRAN-ReportingSystemIEs-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 NGRAN-ReportingSystemIEs-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EUTRAN-CellToReportItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ReportingSystem ::= CHOICE {
 eUTRAN
 EUTRAN-ReportingSystemIEs,
 NGRAN-ReportingSystemIEs,
 ReportingSystem-ExtIEs NGAP-PROTOCOL-IES ::=
 EUTRAN-ReportingSystemIEs::= SEQUENCE {
 eUTRAN-CellToReportList
 EUTRAN-CellToReportItem::= SEQUENCE {
 EUTRA-CGI,
 NULL,
 choice-Extensions
 iE-Extensions
iE-Extensions
 iE-Extensions
 noReporting
 nGRAN
```

NGRAN-CGI,

NGRAN-CellToReportItem::= SEQUENCE {

nGRAN-CGI

```
ProtocolExtensionContainer { {NGRAN-CellToReportItem-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {EventBasedReportingIEs-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {PeriodicReportingIEs-ExtIEs} } OPTIONAL,
 NumberOfMeasurementReportingLevels,
 IntersystemResourceThreshold,
 ProtocolIE-SingleContainer { { ReportType-ExtIEs}}
 IntersystemResourceThreshold,
 NumberOfMeasurementReportingLevels ::= ENUMERATED {n2, n3, n4, n5, n10, ...}
 EventBasedReportingIEs-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 NGRAN-CellToReportItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ReportingPeriodicity,
 PeriodicReportingIES-ExtIES NGAP-PROTOCOL-EXTENSION ::=
 EventBasedReportingIEs,
 PeriodicReportingIEs,
 IntersystemResourceThreshold ::= INTEGER(0..100)
 BIT STRING(SIZE(32))
 ReportType-ExtIEs NGAP-PROTOCOL-IES ::= {
 numberOfMeasurementReportingLevels
 ReportingPeriodicity ::= ENUMERATED {
 EventBasedReportingIEs ::= SEQUENCE {
 intersystemResourceThresholdHigh
 intersystemResourceThresholdLow
 PeriodicReportingIEs ::= SEQUENCE {
 ReportCharacteristics ::=
 reportingPeriodicity
 ReportType ::= CHOICE {
 eventBasedReporting
 periodicReporting
 choice-Extensions
iE-Extensions
 iE-Extensions
 iE-Extensions
 ms2000,
ms5000,
 ms10000
 single,
 ms1000,
 stop,
 :
```

```
ActivatedCellList,
INTEGER(0..16384, ...),
ProtocolExtensionContainer { { IntersystemCellActivationReply-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolIE-SingleContainer { { IntersystemSONInformationReply-ExtIEs} }
 ReportingSystem,
ProtocolExtensionContainer { { IntersystemResourceStatusReply-ExtIEs} }
 ActivatedCellList ::= SEQUENCE (SIZE(1..maxnoofCellsinNGRANNode)) OF NGRAN-CGI
 IntersystemResourceStatusReply-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 IntersystemCellActivationReply-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 InterSystemFailureIndication,
 IntersystemResourceStatusReply,
 IntersystemCellActivationReply,
 IntersystemSONInformationReply-ExtIEs NGAP-PROTOCOL-IES ::= {
 InterSystemHOReport,
 IntersystemCellActivationReply ::= SEQUENCE {
 IntersystemResourceStatusReply ::= SEQUENCE {
 IntersystemSONInformationReport::= CHOICE {
 IntersystemSONInformationReply ::= CHOICE {
 -- INTER SYSTEM SON INFORMATION REPORT
-- INTER SYSTEM SON INFORMATION REPLY
 Inter System Resource Status Reply
 failureIndicationInformation
 nGRAN-CellActivation
 hOReportInformation
 choice-Extensions
 activatedCellList
 reportingsystem iE-Extensions
 resourceStatus
 activation-ID
 iE-Extensions
 | |
```

```
PRESENCE mandatory } | PRESENCE mandatory },
 OPTIONAL,
 ResourceStatusReportingSystem,
ProtocolExtensionContainer { { IntersystemResourceStatusReport-ExtIEs} }
 ProtocolExtensionContainer { { IntersystemCellStateIndication-ExtIEs} } OPTIONAL,
 TYPE IntersystemResourceStatusReport
 TYPE IntersystemCellStateIndication
 ProtocolIE-SingleContainer { { ResourceStatusReportingSystem-ExtIEs}}
ProtocolIE-SingleContainer { { IntersystemSONInformationReport-ExtIEs} }
 ProtocolExtensionContainer { { NotificationCell-Item-ExtIEs} } OPTIONAL,
 NotificationCellList ::= SEQUENCE (SIZE(1.. maxnoofCellsinNGRANNode)) OF NotificationCell-Item
 ENUMERATED {activated, deactivated, ...},
 IntersystemResourceStatusReport-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CRITICALITY ignore
 IntersystemCellStateIndication-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 ResourceStatusReportingSystem-ExtIEs NGAP-PROTOCOL-IES ::= {
 EUTRAN-ReportingStatusIEs,
 NGRAN-ReportingStatusIEs,
 NotificationCell-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 NotificationCellList,
 IntersystemResourceStatusReport ::= SEQUENCE {
 IntersystemCellStateIndication ::= SEQUENCE {
 { ID id-IntersystemResourceStatusUpdate
 ResourceStatusReportingSystem ::= CHOICE {
 NGRAN-CGI,
 Inter System Resource Status Report
 NotificationCell-Item ::= SEQUENCE {
 eUTRAN-ReportingStatus
 nGRAN-ReportingStatus
 notificationCellList
 choice-Extensions
choice-Extensions
 reportingSystem
 iE-Extensions
 iE-Extensions
 iE-Extensions
 notifyFlag
 nGRAN-CGI
 1
```

```
ProtocolExtensionContainer { {EUTRAN-RadioResourceStatus-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { EUTRAN-CompositeAvailableCapacityGroup-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {CompositeAvailableCapacity-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {EUTRAN-ReportingStatusIEs-ExtIEs}
 EUTRAN-CompositeAvailableCapacityGroup,
 CompositeAvailableCapacity,
 CompositeAvailableCapacity,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 EUTRAN-RadioResourceStatus
 EUTRAN-CompositeAvailableCapacityGroup-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EUTRAN-NumberOfactiveUEs
 NGRAN-NoofRRCConnections
 EUTRAN-CellToReportList,
 (00.100),
 (00.100),
 (00.100),
 (00.100),
 INTEGER (0..100),
 (00:100)
 (0..100)
 EUTRAN-RadioResourceStatus-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 CompositeAvailableCapacity-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EUTRAN-ReportingStatusIES-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 INTEGER
 INTEGER
 NTEGER
 INTEGER
 INTEGER
 INTEGER
 INTEGER
 EUTRAN-NumberOfActiveUEs ::= INTEGER (0..16777215, ...)
 ::= SEQUENCE {
 INTEGER (1..100, ...)
INTEGER (0..100),
 eUTRAN-CompositeAvailableCapacityGroup
 CompositeAvailableCapacity ::= SEQUENCE {
 EUTRAN-RadioResourceStatus ::= SEQUENCE {
EUTRAN-ReportingStatusIEs::= SEQUENCE {
 EUTRAN-CompositeAvailableCapacityGroup
 uL-scheduling-PDCCH-CCE-usage
 dL-CompositeAvailableCapacity
 dL-scheduling-PDCCH-CCE-usage
 uL-CompositeAvailableCapacity
 eUTRAN-RadioResourceStatus
 eUTRAN-NoofRRCConnections
 eUTRAN-NumberOfActiveUEs
 eUTRAN-CellToReportList
 cellCapacityClassValue
 dL-non-GBR-PRB-usage
 uL-non-GBR-PRB-usage
 dL-Total-PRB-usage
 uL-Total-PRB-usage
 dL-GBR-PRB-usage
 uL-GBR-PRB-usage
 iE-Extensions
 capacityValue
 iE-Extensions
 iE-Extensions
 iE-Extensions
```

```
ProtocolExtensionContainer { { NGRAN-RadioResourceStatus-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolIE-SingleContainer { { InterSystemHandoverReportType-ExtIEs} }
 ProtocolExtensionContainer { { InterSystemHOReport-ExtIEs} }
 EUTRAN-CompositeAvailableCapacityGroup,
 ProtocolExtensionContainer { {NGRAN-ReportingStatusIEs-ExtIEs}
 NGRAN-RadioResourceStatus
 NGRAN-NoofRRCConnections
 NGRAN-NumberOfActiveUEs
 NGRAN-CellToReportList,
 IntersystemUnnecessaryHO,
 NGRAN-RadioResourceStatus-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 TooearlyIntersystemHO,
 INTEGER (0..100),
 INTEGER (0..100),
 INTEGER (0..100),
 INTEGER (0..100),
 INTEGER (0..100),
 INTEGER (0..100),
 InterSystemHandoverReportType-ExtIEs NGAP-PROTOCOL-IES ::= {
 NGRAN-ReportingStatusIEs-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 InterSystemHandoverReportType,
 InterSystemHOReport-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 NGRAN-NumberOfActiveUEs ::= INTEGER (0..16777215, ...)
 NGRAN-NoofRRCConnections ::= INTEGER (1..65536, ...)
 InterSystemHandoverReportType ::= CHOICE {
 nGRAN-CompositeAvailableCapacityGroup
 ::= SEQUENCE
NGRAN-ReportingStatusIEs ::= SEQUENCE {
 InterSystemHOReport ::= SEQUENCE {
 dL-non-GBR-PRB-usage-for-MIMO
 uL-non-GBR-PRB-usage-for-MIMO
 uL-Total-PRB-usage-for-MIMO
 dL-Total-PRB-usage-for-MIMO
 uL-GBR-PRB-usage-for-MIMO
 nGRAN-RadioResourceStatus
 dL-GBR-PRB-usage-for-MIMO
 nGRAN-NoofRRCConnections
 intersystemUnnecessaryHO
 nGRAN-NumberOfActiveUEs
 nGRAN-CellToReportList
 NGRAN-RadioResourceStatus
 tooearlyIntersystemHO
 handoverReportType
 choice-Extensions
 iE-Extensions
 iE-Extensions
 iE-Extensions
 :
```

```
OPTIONAL,
 ProtocolIE-SingleContainer { {LastVisitedCellInformation-ExtIEs} }
 ProtocolExtensionContainer { { IntersystemUnnecessaryHO-ExtIEs} }
 ProtocolExtensionContainer { {LastVisitedCellItem-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { {LAI-ExtIEs} } OPTIONAL,
 LastVisitedCellInformation,
 IntersystemUnnecessaryHO-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 EUTRA-CGI,
ENUMERATED {true, false, ...},
CandidateCellList,
 LastVisitedCellItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 LastVisitedCellInformation-ExtIEs NGAP-PROTOCOL-IES ::=
 LastVisitedEUTRANCellInformation,
 LastVisitedUTRANCellInformation,
 LastVisitedNGRANCellInformation,
 LastVisitedGERANCellInformation,
 LAI-EXTIES NGAP-PROTOCOL-EXTENSION ::= {
IntersystemUnnecessaryHO ::= SEQUENCE {
 LastVisitedCellInformation ::= CHOICE {
 NGRAN-CGI,
 PLMNIdentity,
 LastVisitedCellItem ::= SEQUENCE {
 LAC ::= OCTET STRING (SIZE (2))
 lastVisitedCellInformation
 LAC,
 choice-Extensions
 candidateCellList
 LAI ::= SEQUENCE {
 iE-Extensions
 iE-Extensions
 iE-Extensions
 targetcellID
 pLMNidentity
 earlyIRATHO
 eUTRANCell
 nGRANCel1
 uTRANCel1
 gERANCe11
 ר
 -
-
 I
 ł
```

LastVisitedEUTRANCellInformation ::= OCTET STRING

```
LastVisitedPSCellList ::= SEQUENCE (SIZE(1..maxnoofPSCellsPerPrimaryCellinUEHistoryInfo)) OF LastVisitedPSCellInformation
 The above IE shall be present if the event type is set to "stop reporting UE presence in the area of interest"
 CRITICALITY ignore EXTENSION LastVisitedPSCellList PRESENCE optional },
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {LastVisitedNGRANCellInformation-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL
 ProtocolExtensionContainer { {LastVisitedPSCellInformation-ExtIEs} }
 TimeUEStayedInCellEnhancedGranularity
 ReportArea,
AreaOfInterestList
LocationReportingReferenceID
 LastVisitedNGRANCellInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 TimeUEStayedInCell,
 LastVisitedPSCellInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 EventType,
 NGRAN-CGI,
 CellType,
 OPTIONAL,
 Cause
 LocationReportingReferenceID ::= INTEGER (1..64, ...)
LastVisitedGERANCellInformation ::= OCTET STRING
 LocationReportingAdditionalInfo ::= ENUMERATED {
 LastVisitedUTRANCellInformation ::= OCTET STRING
 locationReportingReferenceIDToBeCancelled
 LastVisitedNGRANCellInformation::= SEQUENCE
 INTEGER (0..40950),
 LastVisitedPSCellInformation ::= SEQUENCE
 LocationReportingRequestType ::= SEQUENCE
 timeUEStayedInCellEnhancedGranularity
 { ID id-LastVisitedPSCellList
 NGRAN-CGI
 LineType ::= ENUMERATED
 areaOfInterestList
 timeUEStayedInCell
 includePSCell,
 iE-Extensions
 iE-Extensions
 hocauseValue
 globalCellID
 reportArea
 pSCellID
 timeStay
 bon,
 dsl,
```

```
PRESENCE optional },
OPTIONAL,
 { ID id-LocationReportingAdditionalInfo CRITICALITY ignore EXTENSION LocationReportingAdditionalInfo
ProtocolExtensionContainer { {LocationReportingRequestType-ExtIEs} }
 ms320, ms640, ms1280, ms2560, ms5120, ms10240, ms20480, ms30720, ms40960, ms61440,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {LoggedMDTNr-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolIE-SingleContainer { {LoggedMDTTrigger-ExtIEs} }
 BluetoothMeasurementConfiguration
 SensorMeasurementConfiguration
 WLANMeasurementConfiguration
 LoggingDuration ::= ENUMERATED {m10, m20, m40, m60, m90, m120, ...}
 LocationReportingRequestType-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AreaScopeOfNeighCellsList
 LoggedMDTTrigger,
 LoggingDuration,
 LoggingInterval,
 LoggedMDTNr-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 LoggedMDTTrigger-ExtIEs NGAP-PROTOCOL-IES ::= {
 LTEM-Indication ::= ENUMERATED {lte-m,...}
 EventTrigger,
 LTEUERLFReportContainer ::= OCTET STRING
 bluetoothMeasurementConfiguration
 sensorMeasurementConfiguration
 wLANMeasurementConfiguration
 LoggingInterval ::= ENUMERATED {
 areaScopeOfNeighCellsList
 both-uplink-and-downlink,
 LoggedMDTTrigger ::= CHOICE{
 Links-to-log ::= ENUMERATED
 LoggedMDTNr ::= SEQUENCE
 choice-Extensions
 loggedMDTTrigger
 loggingDuration
 loggingInterval
 iE-Extensions
 iE-Extensions
 eventTrigger
 periodical
 infinity,
 downlink,
 uplink,
```

```
ProtocolExtensionContainer { { MBS-DataForwardingResponseMRBItem-ExtIEs} } OPTIONAL,
 MBS-MappingandDataForwardingRequestList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MBS-MappingandDataForwardingRequestItem
 ProtocolExtensionContainer { {LTEUE-Sidelink-Aggregate-MaximumBitrates-ExtIEs} } OPTIONAL,
 SEQUENCE (SIZE(1..maxnoofMRBs)) OF MBS-DataForwardingResponseMRBItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {LTEV2XServicesAuthorized-ExtIEs}
 OPTIONAL,
 LTEUE-Sidelink-Aggregate-MaximumBitrates-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-DataForwardingResponseMRBItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 UPTransportLayerInformation,
 MaximumDataBurstVolume ::= INTEGER (0..4095, ..., 4096.. 2000000)
 MRB-ProgressInformation
 LTEV2XServicesAuthorized-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 BitRate,
 LTEUESidelinkAggregateMaximumBitrate ::= SEQUENCE {
 MaximumIntegrityProtectedDataRate ::= ENUMERATED
 SEQUENCE {
 MBS-AreaSessionID ::= INTEGER (0..65535, ...)
 MessageIdentifier ::= BIT STRING (SIZE(16))
 MaskedIMEISV ::= BIT STRING (SIZE(64))
 MBS-DataForwardingResponseMRBItem ::=
LTEV2XServicesAuthorized ::= SEQUENCE
 MBS-DataForwardingResponseMRBList ::=
 uESidelinkAggregateMaximumBitRate
 PedestrianUE
 dL-Forwarding-UPTNLInformation
 VehicleUE
 mRB-ProgressInformation
 maximum-UE-rate,
 iE-Extensions
 pedestrianUE
iE-Extensions
 iE-Extensions
 bitrate64kbs,
 vehicleUE
```

```
MBS-ServiceAreaInformationList ::= SEQUENCE (SIZE(1..maxnoofMBSServiceAreaInformation)) OF MBS-ServiceAreaInformationItem
 OPTIONAL,
 ProtocolExtensionContainer { {MBS-QoSFlowsToBeSetupItem-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { { MBS-MappingandDataForwardingRequestItem-ExtIEs} }
 MBS-QoSFlowsToBeSetupList ::= SEQUENCE (SIZE(1.. maxnoofMBSQoSFlows)) OF MBS-QoSFlowsToBeSetupItem
 ProtocolIE-SingleContainer { { MRB-ProgressInformation-ExtIEs} }
 OPTIONAL,
 MBS-ServiceAreaInformationList,
ProtocolIE-SingleContainer { {MBS-ServiceArea-ExtIEs} }
 MBS-QoSFlowList ::= SEQUENCE (SIZE(1...maxnoofMBSQoSFlowS)) OF QosFlowIdentifier
 MBS-MappingandDataForwardingRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 QosFlowLevelQosParameters,
 MRB-ProgressInformation
 MBS-ServiceAreaInformation,
 MBS-QoSFlowsTobeSetupItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 QosFlowIdentifier,
 MBS-QoSFlowList,
 INTEGER (0..262143),
 MBS-ServiceAreaInformation,
MBS-MappingandDataForwardingRequestItem ::= SEQUENCE {
 INTEGER (0..4095),
 MBS-AreaSessionID,
 MRB-ProgressInformation-ExtIEs NGAP-PROTOCOL-IES ::=
 MBS-ServiceAreaInformationItem ::= SEQUENCE {
 MBS-ServiceArea-ExtIEs NGAP-PROTOCOL-IES ::=
 MBS-QoSFlowsToBeSetupItem ::= SEQUENCE
 MRB-ProgressInformation ::= CHOICE
 mBSqosFlowLevelQosParameters
 mBS-ServiceAreaInformation
 mRB-ProgressInformation
 MBS-ServiceArea ::= CHOICE
 mBSqosFlowIdentifier
 locationindependent
 locationdependent choice-Extensions
 choice-Extensions
 mBS-AreaSessionID
 pDCP-SN-Length12
 pDCP-SN-Length18
 mBS-QoSFlowList
 iE-Extensions
 iE-Extensions
```

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MBS-ActiveSessionInformation-SourcetoTargetList ::= SEQUENCE (SIZE(1..maxnoofMBSSessionsofUE)) OF MBS-ActiveSessionInformation-SourcetoTargetItem
 ProtocolExtensionContainer { {MBS-ServiceAreaInformationItem-ExtIEs} } OPTIONAL,
 OPTIONAL,
 OPTIONAL
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 MBSSessionFailedtoSetupList ::= SEQUENCE (SIZE(1.. maxnoofMBSSessions)) OF MBSSessionFailedtoSetupItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MBSSessionFailedtoSetupItem-ExtIEs} }
 ProtocolExtensionContainer { {MBS-ServiceAreaInformation-ExtIEs} }
 ProtocolExtensionContainer { {MBS-SessionID-ExtIEs} }
 MBS-ServiceAreaCellList ::= SEQUENCE (SIZE(1.. maxnoofCellsforMBS)) OF NR-CGI
 TAI
 MBS-ServiceAreaTAIList ::= SEQUENCE (SIZE(1.. maxnoofTAIforMBS)) OF
 MBS-ServiceAreaInformationItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MBS-AreaSessionID
 MBS-ServiceArea
 MBSSessionFailedtoSetupItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-ActiveSessionInformation-SourcetoTargetItem ::= SEQUENCE {
 MBS-SessionID,
 MBS-ServiceAreaInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-ServiceAreaCellList
 MBS-ServiceAreaTAIList
 MBS-SessionID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-AreaSessionID
 ::= SEQUENCE {
 MBS-SessionID,
 ::= SEQUENCE {
 TMGI,
 Cause,
 MBSSessionFailedtoSetupItem
 MBS-ServiceAreaInformation
 mBS-ServiceAreaCellList
 MBS-SessionID ::= SEQUENCE
 mBS-ServiceAreaTAIList
 mBS-AreaSessionID
 mBS-AreaSessionID
 mBS-ServiceArea
 mBS-SessionID
iE-Extensions
 mBS-SessionID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 cause
 tMGI
 nID
 :
```

```
MBS-ActiveSessionInformation-TargettoSourceList ::= SEQUENCE (SIZE(1..maxnoofMBSSessionsofUE)) OF MBS-ActiveSessionInformation-TargettoSourceItem
 _
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MBS-ActiveSessionInformation-SourcetoTargetItem-ExtIEs} } OPTIONAL,
 PRESENCE optional
 ProtocolExtensionContainer { { MBS-ActiveSessionInformation-TargettoSourceItem-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 MBSSessionSetupResponseList ::= SEQUENCE (SIZE(1.. maxnoofMBSSessions)) OF MBSSessionSetupResponseItem
 OPTIONAL,
 { {MBSSessionSetupOrModRequestTransferIEs} },
 ProtocolExtensionContainer { { MBSSessionSetupResponseItem-ExtIEs} }
MBS-QoSFlowsToBeSetupList, MBS-MappingandDataForwardingRequestList
 MBS-ActiveSessionInformation-SourcetoTargetItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-ActiveSessionInformation-TargettoSourceItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-DataForwardingResponseMRBList
 MBSSessionSetupOrModFailureTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBSSessionSetupResponseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-ActiveSessionInformation-TargettoSourceItem ::= SEQUENCE {
 MBS-SessionID,
 MBSSessionSetupOrModRequestTransfer ::= SEQUENCE {
 MBSSessionSetupOrModFailureTransfer ::= SEQUENCE
 MBS-AreaSessionID
 mBS-MappingandDataForwardingRequestList
 MBS-SessionID,
 MBSSessionSetupResponseItem ::= SEQUENCE
 ProtocolIE-Container
 mBS-DataForwardingResponseMRBList
 mBS-QoSFlowsToBeSetupList
 mBS-AreaSessionID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 protocolIEs
 :
```

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PRESENCE mandatory
 PRESENCE optional
 OPTIONAL,
 OPTIONAL,
 MBS-SessionTNLInfo5GCList ::= SEQUENCE (SIZE(1..maxnoofMBSServiceAreaInformation)) OF MBS-SessionTNLInfo5GCItem
 ProtocolExtensionContainer { {MBSSessionReleaseResponseTransfer-ExtIEs} } OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {MBSSessionSetupOrModResponseTransfer-ExtIEs} }
 TYPE MBS-QoSFlowsToBeSetupList
 TYPE MBS-SessionFSAIDList
 ProtocolExtensionContainer { {MBS-SessionTNLInfo5GCItem-ExtIEs} }
 ProtocolIE-SingleContainer { {MBS-SessionTNLInfo5GC-ExtIEs} }
 MBS-SessionFSAIDList ::= SEQUENCE (SIZE(1.. maxnoofMBSFSAs)) OF MBS-SessionFSAID
 SharedNGU-MulticastTNLInformation,
 OPTIONAL,
 MBSSessionSetupOrModResponseTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MBSSessionReleaseResponseTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 CRITICALITY ignore
CRITICALITY reject
 SharedNGU-MulticastTNLInformation,
 MBS-SessionTNLInfo5GC1tem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MBS-AreaSessionID,
 MBS-SessionTNLInfo5GCList,
 MBS-SessionTNLInfoNGRAN
 MBS-SessionTNLInfoNGRAN
 MBSSessionSetupOrModResponseTransfer ::= SEQUENCE {
 MBS-SessionTNLInfo5GC-ExtIEs NGAP-PROTOCOL-IES ::=
 MBSSessionReleaseResponseTransfer ::= SEQUENCE {
 MBS-SessionFSAID ::= OCTET STRING (SIZE(3))
{ ID id-MBS-QoSFlowsToBeSetupModList { ID id-MBS-SessionFSAIDList
 MBS-SessionTNLInfo5GCItem ::= SEQUENCE
 sharedNGU-MulticastTNLInformation
 MBS-SupportIndicator ::= ENUMERATED
 MBS-SessionTNLInfo5GC ::= CHOICE {
 mBS-SessionTNLInfoNGRAN
 mBS-SessionTNLInfoNGRAN
 locationindependent
 locationdependent
 choice-Extensions
 mBS-AreaSessionID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 true,
 :
```

```
MBS-SessionTNLInfoNGRANList ::= SEQUENCE (SIZE(1..maxnoofMBSServiceAreaInformation)) OF MBS-SessionTNLInfoNGRANItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MBS-DistributionReleaseRequesTransfer-ExtIEs} } OPTIONAL
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MBS-DistributionSetupRequestTransfer-ExtIEs} }
 MBS-SessionTNLInfoNGRANList,
ProtocolIE-SingleContainer { {MBS-SessionTNLInfoNGRAN-ExtIEs} }
 ProtocolExtensionContainer { {MBS-SessionTNLInfoNGRANItem-ExtIEs} }
 OPTIONAL,
 MBS-DistributionReleaseRequesTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MBS-DistributionSetupRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MBS-AreaSessionID
UPTransportLayerInformation
 UPTransportLayerInformation
 UPTransportLayerInformation
 MBS-AreaSessionID
 MBS-SessionTNLInfoNGRANItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-SessionID,
 MBS-AreaSessionID
 UPTransportLayerInformation,
 MBS-AreaSessionID,
 MBS-SessionID,
 MBS-SessionID,
 MBS-DistributionReleaseRequestTransfer ::= SEQUENCE {
 MBS-SessionTNLInfoNGRAN-ExtIEs NGAP-PROTOCOL-IES ::=
 MBS-DistributionSetupResponseTransfer ::= SEQUENCE {
 MBS-DistributionSetupRequestTransfer ::= SEQUENCE {
 Cause,
 MBS-SessionTNLInfoNGRANItem ::= SEQUENCE {
MBS-SessionTNLInfoNGRAN ::= CHOICE {
 sharedNGU-UnicastTNLInformation
 sharedNGU-UnicastTNLInformation
 sharedNGU-UnicastTNLInformation
 locationindependent
 locationdependent choice-Extensions
 mBS-AreaSessionID
 mBS-AreaSessionID
 mBS-AreaSessionID
 mBS-AreaSessionID
 iE-Extensions
 iE-Extensions
 iE-Extensions
 mBS-SessionID
 mBS-SessionID
 mBS-SessionID
 cause
```

```
OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MBSSessionSetupRequestItem-ExtIEs} }
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 MBSSessionSetuporModifyRequestList ::= SEQUENCE (SIZE(1...maxnoofMBSSessions)) OF MBSSessionSetuporModifyRequestItem
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {MBS-DistributionSetupResponseTransfer-ExtIEs} }
 AssociatedMBSQosFlowSetuporModifyRequestList
 MBSSessionSetupRequestList ::= SEQUENCE (SIZE(1..maxnoofMBSSessions)) OF MBSSessionSetupRequestItem
 ProtocolExtensionContainer {{MBSSessionSetuporModifyRequestItem-ExtIEs}}
 OPTIONAL,
OPTIONAL,
 AssociatedMBSQosFlowSetupRequestList
 MBS-DistributionSetupUnsuccessfulTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 QosFlowListWithCause
 MBS-QoSFlowsToBeSetupList,
MBS-SessionTNLInfo5GCItem
 MBS-AreaSessionID
 MBS-DistributionSetupResponseTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-SessionID,
 MBSSessionSetuporModifyRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-AreaSessionID
 MBS-SessionID,
 MBSSessionStatus,
 MBS-ServiceArea
 MBSSessionSetupRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MBS-DistributionSetupUnsuccessfulTransfer ::= SEQUENCE
 MBS-AreaSessionID
 associatedMBSQosFlowSetuporModifyRequestList
 MBSSessionSetuporModifyRequestItem ::= SEQUENCE
 MBS-SessionID,
 associatedMBSQosFlowSetupRequestList
 MBSSessionSetupRequestItem ::= SEQUENCE
 Cause,
sharedNGU-MulticastTNLInformation
 mBS-QoSFlowsToBeSetupList
 mBS-QosFlowToReleaseList
 mBS-AreaSessionID
 mBS-AreaSessionID
 mBS-AreaSessionID
 mBSSessionStatus
 mBS-ServiceArea
 iE-Extensions
 mBS-SessionID
 mBS-SessionID
 iE-Extensions
 mBS-SessionID
 iE-Extensions
 cause
```

MBSSessionToReleaseList ::= SEQUENCE (SIZE(1..maxnoofMBSSessions)) OF MBSSessionToReleaseItem

```
PRESENCE optional
 PRESENCE optional
 PRESENCE optional PRESENCE optional
 EXTENSION CNTypeRestrictionsForServing
EXTENSION CNTypeRestrictionsForEquivalent
EXTENSION NPN-MobilityInformation
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { {MobilityRestrictionList-ExtIEs} } OPTIONAL,
 EXTENSION PLMNIdentity
 ProtocolExtensionContainer { { MBSSessionToReleaseItem-ExtIEs} }
 CRITICALITY ignore
 CRITICALITY ignore
 CRITICALITY reject
 CRITICALITY ignore
 MBSSessionToReleaseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MobilityRestrictionList-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 ForbiddenAreaInformation
 ServiceAreaInformation
 EquivalentPLMNs
 RATRestrictions
 PLMNIdentity,
 MobilityInformation ::= BIT STRING (SIZE(16))
 ID id-CNTypeRestrictionsForServing
ID id-CNTypeRestrictionsForEquivalent
ID id-NPN-MobilityInformation
 NGRANTraceID,
MBSSessionToReleaseItem ::= SEQUENCE {
 MBS-SessionID,
 MobilityRestrictionList ::= SEQUENCE
 MICOModeIndication ::= ENUMERATED {
 { ID id-LastEUTRAN-PLMNIdentity
 MBSSessionStatus ::= ENUMERATED
 Cause,
 MDT-AlignmentInfo ::= CHOICE {
 forbiddenAreaInformation
 MicoallPLMN ::= ENUMERATED
 serviceAreaInformation
 rATRestrictions
 equivalentPLMNs
 iE-Extensions
 mBS-SessionID
 iE-Extensions
 deactivated,
 servingPLMN
 s-basedMDT
 activated,
 true,
 true,
```

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```
OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 OPTIONAL,
 ProtocolExtensionContainer { { MDT-Configuration-ExtIEs} } OPTIONAL,
 ProtocolExtensionContainer { { MDT-Configuration-EUTRA-ExtIEs} }
ProtocolIE-SingleContainer { { MDT-AlignmentInfo-ExtIEs} }
 ANList MDTPLMNList
ProtocolExtensionContainer { { MDT-Configuration-NR-ExtIEs} }
 MDTPLMNModificationList ::= SEQUENCE (SIZE(0..maxnoofMDTPLMNS)) OF PLMNIdentity
 MDTPLMNList ::= SEQUENCE (SIZE(1..maxnoofMDTPLMNs)) OF PLMNIdentity
 OPTIONAL,
 OPTIONAL,
 MDT-Configuration-EUTRA-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 MDT-Configuration-NR-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
 MDT-Configuration-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
 AreaScopeOfMDT-EUTRA,
 AreaScopeOfMDT-NR,
 MDT-Configuration-EUTRA
 MDT-Activation,
 MDT-AlignmentInfo-ExtIEs NGAP-PROTOCOL-IES ::=
 MDT-Activation,
 MDTModeEutra,
 MDT-Configuration-NR
 MDTPLMNList
 MDTModeNr,
 MDT-Configuration-EUTRA ::= SEQUENCE {
 MDT-Configuration-NR ::= SEQUENCE {
 SEQUENCE {
 signallingBasedMDTPLMNList
iE-Extensions Protoco
 signallingBasedMDTPLMNList
 MDT-Activation ::= ENUMERATED
 logged-MDT-only,
immediate-MDT-and-Trace,
 immediate-MDT-only,
 MDT-Configuration ::=
 choice-Extensions
 mdt-Config-EUTRA
 mdt-Activation
 mdt-Activation
 areaScopeOfMDT
 areaScopeOfMDT
 iE-Extensions
 mdt-Config-NR
 iE-Extensions
 mDTMode
```

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```
OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ~~~~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ProtocolExtensionContainer { { MulticastSessionActivationRequestTransfer-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRESENCE mandatory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRESENCE optional PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProtocolExtensionContainer { { MulticastSessionDeactivationRequestTransfer-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MulticastGroupPagingAreaList ::= SEQUENCE (SIZE(1..maxnoofPagingAreas)) OF MulticastGroupPagingAreaItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TYPE MBS-ServiceArea
TYPE MBS-QoSFlowsToBeSetupList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       { {MulticastSessionUpdateRequestTransferIEs} },
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MBS-SessionTNLInfo5GC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE QOSFlowListWithCause
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE MBS-SessionID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MulticastSessionDeactivationRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                ProtocolIE-SingleContainer { {MDTModeNr-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MulticastSessionActivationRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION :==
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MulticastSessionUpdateRequestTransferIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MulticastSessionDeactivationRequestTransfer ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                MulticastSessionActivationRequestTransfer ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MulticastSessionUpdateRequestTransfer ::= SEQUENCE {
                        ImmediateMDTNr,
                                                                                                                                                                                                                                                                                                                                  MeasurementsToActivate ::= BIT STRING(SIZE(8))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MBS-SessionID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MBS-SessionID,
                                                        LoggedMDTNr,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ProtocolIE-Container
                                                                                                                                                                 MDTModeNr-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                          MRB-ID ::= INTEGER (1..32, ...)
                                                                                                                                                                                                                                                                               MDTModeEutra ::= OCTET STRING
                                                                                  choice-Extensions
MDTModeNr ::= CHOICE
                        immediateMDTNr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mBS-SessionID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mBS-SessionID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     iE-Extensions
                                                        loggedMDTNr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protocolIEs
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PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The above IE shall be present if the M1 Reporting Trigger IE is set to "A2event-triggered" or "A2event-triggered periodic"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              miperiodicReporting MIPeriodicReporting
The above IE shall be present if the M1 Reporting Trigger IE is set to "periodic" or "A2event-triggered periodic"
iE-Extensions ProtocolExtensionContainer { { M1Configuration-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CRITICALITY ignore EXTENSION IncludeBeamMeasurementsIndication
                                                                    OPTIONAL,
                                                                                                          OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ProtocolExtensionContainer { { MulticastGroupPagingArea-ExtIEs} } OPTIONAL,
                                                                                                          ProtocolExtensionContainer { { MulticastGroupPagingAreaItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ProtocolExtensionContainer { { UE-PagingItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    UE-PagingList ::= SEQUENCE (SIZE(1..maxnoofUEsforPaging)) OF UE-PagingItem
                                                                                                                                                                                                                                                                                                                                                                                                          MBS-AreaTAIList ::= SEQUENCE (SIZE(1..maxnoofTAIforPaging)) OF TAI
                                                                                                                                                                                                                                                        MulticastGroupPagingAreaItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                MulticastGroupPagingArea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MulticastGroupPagingArea-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               UEIdentityIndexValue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M1Configuration-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M1ReportingTrigger,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               M1ThresholdEventA2
                                                                 UE-PagingList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UE-PagingItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IncludeBeamMeasurementsIndication ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            { ID id-IncludeBeamMeasurementsIndication
MulticastGroupPagingAreaItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PagingDRX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MBS-AreaTAIList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MulticastGroupPagingArea ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           M1Configuration ::= SEQUENCE
                                   multicastGroupPagingArea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              UE-PagingItem :: SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  uEIdentityIndexValue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mlreportingTrigger
mlthresholdEventA2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mBS-AreaTAIList
                                                                                                       iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        iE-Extensions
                                                                    uE-PagingList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pagingDRX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       true,
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PRESENCE optional },
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRITICALITY ignore EXTENSION ExtendedReportIntervalMDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolExtensionContainer { { MIPeriodicReporting-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                      ProtocolExtensionContainer { { MIThresholdEventA2-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Links-to-log,
ProtocolExtensionContainer { { M4Configuration-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolIE-SingleContainer { {MIThresholdType-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       M1PeriodicReporting-ExtIEs NGAP-PROTOCOL-EXTENSION ::= { { ID id-ExtendedReportIntervalMDT
                                                                                                                                                                                                                                                                                                                                                 M1ThresholdEventA2-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ReportIntervalMDT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ReportAmountMDT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Threshold-RSRQ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Threshold-SINR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Threshold-RSRP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           M1ThresholdType-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                             MlThresholdType,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    M1PeriodicReporting ::= SEQUENCE {
M1ReportingTrigger ::= ENUMERATED
                                                                                                                                                                                   M1ThresholdEventA2 ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      M4period,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M4Configuration ::= SEQUENCE {
                                                                            a2eventtriggered-periodic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                        M1ThresholdType ::= CHOICE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              choice-Extensions
                                                       a2eventtriggered,
                                                                                                                                                                                                                 mlThresholdType
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           m4-links-to-log
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             threshold-RSRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             threshold-RSRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       threshold-SINR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                reportInterval
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     iE-Extensions
                                                                                                                                                                                                                                         iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          reportAmount
                             periodic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      m4period
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"uplink" or "both-uplink-and-downlink"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1, min6, min12, min30,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        M6DelayThreshold ::= ENUMERATED {ms0dot25, ms0dot5, ms1, ms2, ms4, ms10, ms20, ms50, ms100, ms500,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolExtensionContainer { { M6Configuration-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                  ProtocolExtensionContainer { { M5Configuration-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Links-to-log,
ProtocolExtensionContainer { { M7Configuration-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    { ID id-M6ReportAmount CRITICALITY ignore EXTENSION M6ReportAmountMDT { ID id-M6DelayThreshold CRITICALITY ignore EXTENSION M6DelayThreshold -- The above IE shall be present if the M6 Links to Log IE is set to the value
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRITICALITY ignore EXTENSION M7ReportAmountMDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                              EXTENSION M5ReportAmountMDT
M4ReportAmountMDT ::= ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 M5ReportAmountMDT ::= ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ::= ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity,
                                                                         M4period ::= ENUMERATED {ms1024, ms2048, ms5120, ms10240, min1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   M5period ::= ENUMERATED {ms1024, ms2048, ms5120, ms10240, min1,
                                                                                                                                                                                                                                                                                                                                                                                                                         M5Configuration-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               M7Configuration-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   M6Configuration-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRITICALITY ignore
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     M6report-Interval
                                                                                                                                                                                                                          Links-to-log,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Links-to-log,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M6report-Interval ::= ENUMERATED {
                                                                                                                                                                                           M5period,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    M7period,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             M6Configuration ::= SEQUENCE {
                                                                                                                                                      M5Configuration ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       { ID id-M7ReportAmount
                                                                                                                                                                                                                                                                                                                                                                                                                                                              { ID id-M5ReportAmount
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     m6report-Interval
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    m6-links-to-log
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M7Configuration ::=
                                                                                                                                                                                                                                m5-links-to-log
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   m7-links-to-log
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  M6ReportAmountMDT
                                                                                                                                                                                                                                                                     iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        iE-Extensions
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ProtocolExtensionContainer { { MDT-Location-Info-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NB-IOT-Paging-eDRXCycle ::= ENUMERATED {
    hf2, hf4, hf6, hf8, hf10, hf12, hf14, hf16, hf32, hf64, hf128, hf256, hf512, hf1024,
M7ReportAmountMDT ::= ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BIT STRING (SIZE(16)),
ProtocolIE-SingleContainer { {N3IWF-ID-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NB-IOT-Paging-TimeWindow ::= ENUMERATED {
    s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16,
                                                                                                                                                                                                 MDT-Location-Information,
                                                                                                                                                                                                                                                                                                                                                                                             MDT-Location-Info-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MDT-Location-Information::= BIT STRING (SIZE (8))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NASSecurityParametersFromNGRAN ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NB-IOT-PagingDRX ::= ENUMERATED {
    rf32, rf64, rf128, rf256, rf512, rf1024,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NB-IOT-DefaultPagingDRX ::= ENUMERATED rf128, rf256, rf512, rf1024,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N3IWF-ID-ExtIES NGAP-PROTOCOL-IES ::=
                                                                            M7period ::= INTEGER(1..60, ...)
                                                                                                                                                           MDT-Location-Info ::= SEQUENCE {
                                                                                                                                                                                                 mDT-Location-Information
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAS-PDU ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N3IWF-ID ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 choice-Extensions
                                                                                                                                                                                                                                    iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              n3IWF-ID
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NGAPIESupportInformationResponseList ::= SEQUENCE (SIZE(1.. maxnoofNGAPIESupportInfo)) OF NGAPIESupportInformationResponseItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGAPIESupportInformationRequestList ::= SEQUENCE (SIZE(1.. maxnoofNGAPIESupportInfo)) OF NGAPIESupportInformationRequestItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolExtensionContainer { { NGAPIESupportInformationRequestItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProtocolExtensionContainer { { NGAPIESupportInformationResponseItem-ExtIEs} }
                                                                          OPTIONAL,
                                                                                                                    ProtocolExtensionContainer { { NB-IOT-Paging-eDRXInfo-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ENUMERATED {supported, not-supported, ...},
ENUMERATED {present, not-present, ...},
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGAPIESupportInformationResponseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGAPIESupportInformationRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                NB-IOT-Paging-eDRXInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                       NB-IoT-Paging-TimeWindow
                                      NB-IoT-Paging-eDRXCycle,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGAPIESupportInformationResponseItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolIE-ID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGAPIESupportInformationRequestItem ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                               NB-IoT-UEPriority ::= INTEGER (0..255, ...)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolIE-ID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NextHopChainingCount ::= INTEGER (0..7)
NB-IoT-Paging-eDRXInfo ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NewSecurityContextInd ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NetworkInstance ::= INTEGER (1..256,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NextPagingAreaScope ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ngap-ProtocolIEPresenceInfo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ngap-ProtocollESupportInfo
                                   nB-IoT-Paging-eDRXCycle
nB-IoT-Paging-TimeWindow
iE-Extensions Proto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ngap-ProtocolIE-Id
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ngap-ProtocolIE-Id
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            changed,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    true,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        same,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRESENCE optional PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPTIONAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProtocolExtensionContainer { { NGRAN-TNLAssociationToRemoveItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ProtocolExtensionContainer { {NonDynamic5QIDescriptor-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolIE-SingleContainer { {NGRAN-CGI-ExtIEs} }
                                                                                                                      ProtocolIE-SingleContainer { {NgENB-ID-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CPTransportLayerInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CPTransportLayerInformation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGRAN-TNLASSOCIAtionToRemoveItem-ExtIES NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NonDynamic5QIDescriptor-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
    ID id-CNPacketDelayBudgetDL CRITICALITY ignore EXTEN {
    ID id-CNPacketDelayBudgetUL CRITICALITY ignore EXTEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MaximumDataBurstVolume
                                                     BIT STRING (SIZE(18)),
BIT STRING (SIZE(21)),
                              BIT STRING (SIZE(20)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PriorityLevelQos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AveragingWindow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NGRAN-TNLAssociationToRemoveItem::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tNLAssociationTransportLayerAddressAMF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tNLAssociationTransportLayerAddress
                                                                                                                                                                                                                      NgENB-ID-ExtIES NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGRANTraceID ::= OCTET STRING (SIZE(8))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FiveQI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGRAN-CGI-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                NotifySourceNGRANNode ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NonDynamic5QIDescriptor ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EUTRA-CGI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NID ::= BIT STRING (SIZE(44))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NR-CGI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             maximumDataBurstVolume
                                                          shortMacroNgENB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGRAN-CGI ::= CHOICE {
                                                                                             longMacroNgENB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                choice-Extensions
NgENB-ID ::= CHOICE {
                                                                                                                           choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           priorityLevelQos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 averagingWindow
                              macroNqENB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                              notifySource,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       eUTRA-CGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fiveQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nR-CGI
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Allowed-PNI-NPN-List,
ProtocolIE-SingleContainer { {NPN-PagingAssistanceInformation-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PNI-NPN-MobilityInformation, ProtocolIE-SingleContainer { (NPN-MobilityInformation-ExtIEs) }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CellCAGList,
ProtocolIE-SingleContainer { {NPN-AccessInformation-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ProtocolIE-SingleContainer { {NPN-Support-ExtIEs} }
NotallowedTACs ::= SEQUENCE (SIZE(1..maxnoofAllowedAreas)) OF TAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SNPN-MobilityInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NPN-PagingAssistanceInformation-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NPN-MobilityInformation-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NPN-AccessInformation-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NPN-PagingAssistanceInformation ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPN-Support-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                              NotificationControl ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NPN-MobilityInformation ::= CHOICE
                                                                  NotificationCause ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                NPN-AccessInformation ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pNI-NPN-MobilityInformation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pNI-NPN-Access-Information
choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pNI-NPN-PagingAssistance
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sNPN-MobilityInformation
                                                                                                                                                                                                                                                                                                         notification-requested,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NPN-Support ::= CHOICE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            choice-Extensions
                                                                                                                                       not-fulfilled,
                                                                                                fulfilled,
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OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ow NR-Paging-Time-Window OPTIONAL,
ProtocolExtensionContainer { {NR-PagingeDRXInformation-ExtIEs} }
                                                                                                                                                                ProtocolExtensionContainer { {NR-CGI-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NR-CGIListForWarning ::= SEQUENCE (SIZE(1..maxnoofCellIDforWarning)) OF NR-CGI
                                                                                                                                                                                                                                                                                                                                                                                                                               NR-CGIList ::= SEQUENCE (SIZE(1..maxnoofCellsingNB)) OF NR-CGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NR-PagingeDRXInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NRintegrityProtectionAlgorithms ::= BIT STRING (SIZE(16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TACListInNRNTN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NRencryptionAlgorithms ::= BIT STRING (SIZE(16, ...))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NR-Paging-eDRX-Cycle,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PLMNIdentity,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         hfquarter, hfhalf, hf1, hf2, hf4, hf8, hf16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hf32, hf64, hf128, hf256, hf512, hf1024,
                                                                                                                                                                                                                                                                                              NR-CGI-ExtIES NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NRMobilityHistoryReport ::= OCTET STRING
NRCellidentity ::= BIT STRING (SIZE(36))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NRUERLFReportContainer ::= OCTET STRING
                                                                                              PLMNIdentity,
NRCellIdentity,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NR-PagingeDRXInformation ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NR-Paging-eDRX-Cycle ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NR-Paging-Time-Window ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NRNTNTAIInformation ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           s11, s12, s13, s14, s15, s16,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NRPPa-PDU ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nR-paging-Time-Window iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nR-paging-eDRX-Cycle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           s1, s2, s3, s4, s5,
s6, s7, s8, s9, s10,
                                                                 NR-CGI ::= SEQUENCE
                                                                                                                                   nRCellIdentity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tACListInNRNTN
                                                                                                                                                                iE-Extensions
                                                                                                      pLMNIdentity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            servingPLMN
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ProtocolExtensionContainer { { NRNTNTAIInformation-ExtIEs} } OPTIONAL,

OPTIONAL,

uELocationDerivedTACINNRNTN iE-Extensions Protoco

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OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ProtocolExtensionContainer { {NRV2XServicesAuthorized-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                              NRFrequencyBand-List ::= SEQUENCE (SIZE(1..maxnoofNRCellBands)) OF NRFrequencyBandItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProtocolExtensionContainer { {NRFrequencyBandItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolExtensionContainer { {NRFrequencyInfo-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NRV2XServicesAuthorized-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
NRNTNTAIInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NRFrequencyBandItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NRFrequencyInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                NumberOfBroadcastsRequested ::= INTEGER (0..65535)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NRFrequencyBand-List,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NRFrequencyBand,
                                                                                                                                                                                                                                                                                                                                                               NRFrequencyBand ::= INTEGER (1..1024, ...)
                                                                                                                                                                   NumberOfBroadcasts ::= INTEGER (0..65535)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NRV2XServicesAuthorized ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VehicleUE
PedestrianUE
                                                                                                                                                                                                                                                                                               NRARFCN ::= INTEGER (0.. maxNRARFCN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NRFrequencyBandItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NR-PCI ::= INTEGER (0..1007, ...)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NRARFCN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NRFrequencyInfo ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            frequencyBand-List
iE-Extension
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nr-frequency-band
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             iE-Extension
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pedestrianUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              vehicleUE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nrarfcn
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ProtocolExtensionContainer { {NRUESidelinkAggregateMaximumBitrate-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OverloadStartNSSAIList ::= SEQUENCE (SIZE (1...maxnoofSliceItems)) OF OverloadStartNSSAIItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolIE-SingleContainer { {OverloadResponse-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OverloadResponse
TrafficLoadReductionIndication
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NRUESidelinkAggregateMaximumBitrate-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       permit-high-priority-sessions-and-mobile-terminated-services-only,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      permit-emergency-sessions-and-mobile-terminated-services-only,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SliceOverloadList,
                                                                                                                                                                                                                                                                                                                                                                                                                  BitRate,
                                                                                                                                                                                                                                                                                                                                                                                   NRUESidelinkAggregateMaximumBitrate ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OverloadResponse-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OverloadAction,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OverloadAction ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              reject-non-emergency-mo-dt,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          reject-rrc-cr-signalling,
                                                                                                                                                                                            PedestrianUE ::= ENUMERATED {
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NSAG-ID ::= INTEGER (0..255,
VehicleUE ::= ENUMERATED {
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sliceOverloadResponse
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                                   authorized,
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ProtocolExtensionContainer { { PagingAssisDataforCEcapabUE-ExtIEs} } OPTIONAL,
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ProtocolExtensionContainer { {OverloadStartNSSAIItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolExtensionContainer { {PacketErrorRate-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolExtensionContainer { {PagingAttemptInformation-ExtIEs} }
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IntendedNumberOfPagingAttempts,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CoverageEnhancementLevel,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PagingAttemptInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                  OverloadStartNSSAIItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PacketErrorRate-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EUTRA-CGI,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PagingAttemptCount ::= INTEGER (1..16, ...)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INTEGER (0..9, ...),
                                                                                                                                                                                                                                                                                                                                                                                             PacketErrorRate ::= SEQUENCE {
    pERScalar INTEGER (0..9, ...),
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iE-Extensions
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PagingCauseIndicationForVoiceService ::= ENUMERATED {

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PRESENCE optional }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolExtensionContainer { {PathSwitchRequestSetupFailedTransfer-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                p00, p05, p10, p15, p20, p25, p30, p35, p40, p45, p50, p55, p60, p65, p70, p75, p80, p85, p90, p95, p100,
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ID id-RedundantUL-NGU-UP-TNLInformation
ID id-AdditionalRedundantNGU-UP-TNLInformation
ID id-QosFlowParametersList
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                                                                                                                                                                                                                                                                                                                                                                                                                                              PagingPriority ::= ENUMERATED {
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                                                                                                     PagingDRX ::= ENUMERATED {
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supported,
                                                                                                                                                                                                                                                                                                                                          non-3gpp,
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v128,
v256,
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                                                                                                                                                                                                         OPTIONAL,
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PathSwitchRequestSetupFailedTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
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                                                                                                                                                                       DL-NGU-TNLInformationReused
UserPlaneSecurityInformation
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ID id-RedundantDL-NGU-TNLInformationReused
ID id-AdditionalRedundantDLQosFlowPerTNLInformation
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                                                                                                                                                                                                         userPlaneSecurityInformation
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                                                                                                                                                                            dL-NGU-TNLInformationReused
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PDUSessionResourceAdmittedList ::= SEQUENCE (SIZE(1..maxnoofPDUSessions)) OF PDUSessionResourceAdmittedItem
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Range
ProtocolExtensionContainer { { PC5QoSFlowItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                           ProtocolExtensionContainer { { PC5FlowBitRates-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PDUSessionAggregateMaximumBitRate-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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BitRate,
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                                                                                                                                                                                 PC5QoSFlowItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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handoverRequestAcknowledgeTransfer
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                                                                                                                                                                                                                                                                                                                             PC5FlowBitRates ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                      quaranteedFlowBitRate
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ETSI TS 138 413 V17.1.1 (2022-08)

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OCTET STRING (CONTAINING PDUSessionResourceModifyIndicationUnsuccessfulTransfer),
PDUSessionResourceFailedToModifyListModCfm ::= SEQUENCE (SIZE(1...maxnoofPDUSessions)) OF PDUSessionResourceFailedToModifyItemModCfm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PDUSessionResourceFailedToModifyListModRes :: SEQUENCE (SIZE(1...maxnoofPDUSessions)) OF PDUSessionResourceFailedToModifyItemModRes
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PDUSessionResourceFailedToSetupListCxtFail ::= SEQUENCE (SIZE(11..maxnoofPDUSessions)) OF PDUSessionResourceFailedToSetupItemCxtFail
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PDUSessionResourceFailedToSetupListSURes ::= SEQUENCE (SIZE(1...maxnoofPDUSessions)) OF PDUSessionResourceFailedToSetupItemSURes
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ProtocolExtensionContainer { {PDUSessionResourceHandoverItem-ExtIEs} } OPTIONAL,
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                                                                                                                         ID id-AdditionalUL-NGU-UP-TNLInformation
ID id-CommonNetworkInstance
ID id-AdditionalRedundantUL-NGU-UP-TNLInf
ID id-RedundantCommonNetworkInstance
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                   id-PDUSessionAggregateMaximumBitRate
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ID id-SecurityIndication
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ID id-MBSSessionFailedtoSetupList
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PDUSessionResourceToReleaseListRelCmd ::= SEQUENCE (SIZE(1..maxnoofPDUSessions)) OF PDUSessionResourceToReleaseItemRelCmd
                                                                                                                                                                    PDUSessionResourceToReleaseListHOCmd :: SEQUENCE (SIZE(1...maxnoofPDUSessions)) OF PDUSessionResourceToReleaseItemHOCmd
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PDUSessionResourceToBeSwitchedDLItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
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ProtocolExtensionContainer { {PEIPSassistanceInformation-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProtocolExtensionContainer { {PLMNSupportItem-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLMNSupportList ::= SEQUENCE (SIZE(1..maxnoofPLMNs)) OF PLMNSupportItem
                                                                                                                                              PEIPSassistanceInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
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                                                                                                                                                                                                                                                                                               Periodicity ::= INTEGER (0..640000, ...)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PLMNAreaBasedQMC ::= SEQUENCE {
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iE-Extensions
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iE-Extensions
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Pre-emptionCapability ::= ENUMERATED

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ProtocolExtensionContainer { { QMCDeactivation-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolIE-SingleContainer { {PWSFailedCellIDList-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            UEAppLayerMeasInfoList,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NR-CGIList,
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                                                                                                                                           Pre-emptionVulnerability ::= ENUMERATED {
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shall-not-trigger-pre-emption,
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                         may-trigger-pre-emption,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QosFlowAddOrModifyRequestList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAddOrModifyRequestItem
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                                              ProtocolIE-SingleContainer { {QosCharacteristics-ExtIEs} }
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[ID id-QosMonitoringReportingFrequency CRITICALITY ignore EXTENSION QosMonitoringReportingFrequency PRESENCE optional],
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EXTENSION TransportLayerAddress PRESENCE optional  
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                                                                                                  ProtocolExtensionContainer { {QosFlowFeedbackItem-ExtIEs} } OPTIONAL,
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                                                                ExtendedPacketDelayBudget
                                 ExtendedPacketDelayBudget
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{ID id-SourceNodeTNLAddrInfo
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                                                                                                ProtocolExtensionContainer { {QosFlowWithCauseItem-ExtIEs} } OPTIONAL,
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ProtocolExtensionContainer { {QosFlowParametersItem-ExtIEs} }
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                                                                                                                                                                                                                                       QosFlowWithCauseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QosFlowNotifyItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      uPTransportLayerInformation
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PRESENCE optional } | PRESENCE optional },
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRESENCE optional
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                                           OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CRITICALITY ignore EXTENSION TSCTrafficCharacteristics CRITICALITY ignore EXTENSION RedundantQosFlowIndicator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ProtocolExtensionContainer { { QosFlowPerTNLInformationItem-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QosFlowSetupRequestList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowSetupRequestItem
                                           ProtocolExtensionContainer { { QosFlowPerTNLInformation-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OosFlowPerTNLInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QosFlowItemWithDataForwarding-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
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                                                                                                                                                                                                          QosFlowPerTNLInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
AssociatedQosFlowList,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QosflowPerTNLInformationItem ::= SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            {ID id-TSCTrafficCharacteristics {ID id-RedundantQosFlowIndicator
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associatedQosFlowList
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ProtocolExtensionContainer { {RANStatusTransfer-TransparentContainer-ExtIEs} } OPTIONAL,
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                                     OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ProtocolExtensionContainer { {QoSFlowsUsageReport-Item-ExtIEs} } OPTIONAL.
                                                                                                                                                                                                                                                                                                                                                 QoSFlowsUsageReportList ::= SEQUENCE (SIZE(1...maxnoofQosFlows)) OF QoSFlowsUsageReport-Item
                                     ProtocolExtensionContainer { {QosFlowToBeForwardedItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Range ::= ENUMERATED {m50, m80, m180, m200, m350, m400, m500, m700, m1000, ...}
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DRBsSubjectToStatusTransferList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ENUMERATED {nr, eutra,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VolumeTimedReportList,
                                                                                                                                                                                             QosFlowToBeForwardedItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QosFlowIdentifier,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RANNodeNameVisibleString ::= VisibleString (SIZE(1..150,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RANNodeNameUTF8String ::= UTF8String (SIZE(1.150, ...))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RANStatusTransfer-TransparentContainer ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RANNodeName ::= PrintableString (SIZE(1..150, ...))
QosFlowIdentifier,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RAN-UE-NGAP-ID ::= INTEGER (0..4294967295)
                                                                                                                                                                                                                                                                                                                                                                                                                                   QoSFlowsUsageReport-Item ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RANPagingPriority ::= INTEGER (1..256)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dRBsSubjectToStatusTransferList
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qosFlowIdentifier
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3GPP TS 38.413 version 17.1.1 Release 17

**NR-OTHERSAT** 

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PRESENCE optional },
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTEGER (0..4095)
   OPTIONAL,
ProtocolExtensionContainer { {RecommendedCellItem-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ProtocolExtensionContainer { {RecommendedCellsForPaging-ExtIEs} }
RATRestrictions ::= SEQUENCE (SIZE(1..maxnoofEPLMNsPlusOne)) OF RATRestrictions-Item
                                                                                                                                                                   ProtocolExtensionContainer { {RATRestrictions-Item-ExtIEs} }
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                                                                                                                                   RATRestrictionInformation,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RecommendedCellList,
                                                                                            PLMNIdentity,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RecommendedCellsForPaging ::= SEQUENCE {
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                                                              RATRestrictions-Item ::= SEQUENCE
                                                                                                                                rATRestrictionInformation iE-Extensions
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                                                                                            pLMNIdentity
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ProtocolExtensionContainer { {RedundantPDUSessionInformation-ExtIEs} } OPTIONAL,
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                                                                                                                                                        RecommendedRANNodeItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RedundantPDUSessionInformation ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                            RedirectionVoiceFallback ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RepetitionPeriod ::= INTEGER (0..131071)
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RecommendedRANNodeItem ::= SEQUENCE {
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                                                                                                                                                                                                                                                               RedCapIndication ::= ENUMERATED
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                             aMFPagingTarget
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                                                                                                                                                                                                                                                                                                                                                                                                                 possible,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cell,
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ReportIntervalMDT ::= ENUMERATED { ms120, ms240, ms480, ms102, ms120, ms120, ms240, ms480, ms640, ms102, ms10240, ms100, 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolIE-SingleContainer { {ResetType-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UE-associatedLogicalNG-connectionList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RGLevelWirelineAccessCharacteristics ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRCInactiveTransitionReportRequest ::= ENUMERATED {
rl, r2, r4, r8, r16, r32, r64, rinfinity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ExtendedReportIntervalMDT ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ResetType-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   subsequent-state-transition-report,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RRCEstablishmentCause ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        single-rrc-connected-state-report,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ResetAll,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RRCContainer ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RNC-ID ::= INTEGER (0..4095)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RoutingID ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRCState ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ms20480, ms40960, ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        emergency,
highPriorityAccess,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mcs-PriorityAccess,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ResetType ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    partOfNG-Interface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mo-ExceptionData
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mo-Signalling,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cancel-report,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ...,
notAvailable,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mo-VideoCall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nG-Interface
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mt-Access,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              mo-Data,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            inactive,
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                                                                                                                                                                                                                                                                         ProtocolExtensionContainer { {RIMInformationTransfer-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ENUMERATED {rs-detected, rs-disappeared, ...},
ProtocolExtensionContainer { {RIMInformation-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProtocolExtensionContainer { {SecondaryRATUsageInformation-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INTEGER (0..86399, ...)
ProtocolExtensionContainer { { ScheduledCommunicationTime-ExtIEs}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ::= SEQUENCE (SIZE(1..maxnoofXnTLAs)) OF TransportLayerAddress
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ScheduledCommunicationTime-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                  RIMInformationTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QoSFlowsUsageReportList
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RIMInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                        TargetRANNodeID,
                                                                                                                                                                                                                    SourceRANNodeID,
                                                                                                                                                                                                                                          RIMInformation,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BIT STRING (SIZE(7))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SecondaryRATUsageInformation ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ScheduledCommunicationTime ::= SEQUENCE {
                                                                                                                                                           RIMInformationTransfer ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GNBSetID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GNBSetID ::= BIT STRING (SIZE(22))
                                                                                                         RSN ::= ENUMERATED {v1, v2, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SD ::= OCTET STRING (SIZE(3))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RIMInformation ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    qosFlowsUsageReportList
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                                                                                                                                                                                        targetRANNodeID
                                                                                                                                                                                                                    sourceRANNodeID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rIM-RSDetection
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                                                                                                                                                                                                                                                                         iE-Extensions
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connected,
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ETSI TS 138 413 V17.1.1 (2022-08)

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CRITICALITY ignore EXTENSION MaximumIntegrityProtectedDataRate PRESENCE optional },
                                                                                                                                                                                                  OPTIONAL,
                                                                                                                                                                                                                                      ProtocolExtensionContainer { {SecondaryRATDataUsageReportTransfer-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SecurityKey,
ProtocolExtensionContainer { {SecurityContext-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolExtensionContainer { {SecurityResult-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MaximumIntegrityProtectedDataRate
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProtocolExtensionContainer { {SecurityIndication-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The above IE shall be present if integrity protection is required or preferred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IntegrityProtectionIndication,
                                                                                                                                                                                                                                                                                                                                                                                                 SecondaryRATDataUsageReportTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ConfidentialityProtectionResult,
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SecondaryRATUsageInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
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                                                                                                                                                           SecondaryRATDataUsageReportTransfer ::= SEQUENCE {
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                                                                                                                                                                                               secondaryRATUsageInformation
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iE-Extensions
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OPTIONAL,
                                                                                                     OPTIONAL,
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                                                                                                     ProtocolExtensionContainer { {SensorMeasurementConfiguration-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                   SensorMeasConfigNameList ::= SEQUENCE (SIZE(1..maxnoofSensorName)) OF SensorMeasConfigNameItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRESENCE optional
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ProtocolIE-SingleContainer { {SensorNameConfig-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ServedGUAMIList ::= SEQUENCE (SIZE(1..maxnoofServedGUAMIS)) OF ServedGUAMIItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRITICALITY ignore EXTENSION GUAMITYPE
                                                                                                                                                                                                                                              SensorMeasurementConfiguration-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ENUMERATED {true, ...},
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ENUMERATED {true, ...},
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SensorMeasConfigNameItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENUMERATED {true,
                                                                   SensorMeasConfigNameList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ServedGUAMIItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                            SensorMeasConfig,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SensorNameConfig-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SensorNameConfig,
SensorMeasurementConfiguration ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SensorMeasConfig::= ENUMERATED {setup,...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SensorMeasConfigNameItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SerialNumber ::= BIT STRING (SIZE(16))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               uncompensatedBarometricConfig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AMFName
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GUAMI,
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                                                                      sensorMeasConfigNameList
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choice-Extensions
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                                 sensorMeasConfig
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ueSpeedConfig
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                                                                                                  iE-Extensions
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OPTIONAL
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                                                                                                                      OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OPTIONAL,
                                                                                                                    ProtocolExtensionContainer { {ServiceAreaInformation-Item-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SliceSupportListQMC ::= SEQUENCE (SIZE(1..maxnoofSNSSAlforQMC)) OF SliceSupportQMC-Item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProtocolExtensionContainer { {SliceOverloadItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S-NSSAI,
ProtocolExtensionContainer { {SliceSupportItem-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SliceOverloadList ::= SEQUENCE (SIZE(1..maxnoofSliceItems)) OF SliceOverloadItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SliceSupportList ::= SEQUENCE (SIZE(1..maxnoofSliceItems)) OF SliceSupportItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SharedNGU-MulticastTNLInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                          ServiceAreaInformation-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                                                                                                                                                                                                                                                 ENUMERATED {streaming, mTSI, vR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SliceOverloadItem-ExtIEs NGAP-PROTOCOL-EXTENSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TransportLayerAddress,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TransportLayerAddress,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SharedNGU-MulticastTNLInformation ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                 SgNB-UE-X2AP-ID ::= INTEGER (0..4294967295)
ServiceAreaInformation-Item ::= SEQUENCE
                                                                                    NotAllowedTACs
                           PLMNIdentity,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTP-TEID,
                                                           AllowedTACs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE {
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SliceOverloadItem ::=
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        iP-SourceAddress
                                                                                         notAllowedTACs
                                                                                                                    iE-Extensions
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                           pLMNIdentity
                                                                                                                                                                                                                                                                                                                                                                        ServiceType ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      iE-Extensions
                                                             allowedTACs
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The above IE shall be present if the SON Information IE contains the SON Information Request IE set to "Xn TNL Configuration Info" iE-Extensions

ProtocolExtensionContainer { {SONConfigurationTransfer-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OPTIONAL,
                                                                OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                         OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                         ProtocolExtensionContainer { {SNPN-MobilityInformation-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPTIONAL,
                                                                ProtocolExtensionContainer { {SliceSupportQMC-Item-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SNPN-MobilityInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                       SliceSupportQMC-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            XnTNLConfigurationInfo
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SourceRANNodeID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TargetRANNodeID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SONInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SONInformation-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S-NSSAI-ExtIES NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SONConfigurationTransfer ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                SNPN-MobilityInformation ::= SEQUENCE {
SliceSupportQMC-Item ::= SEQUENCE
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                             S-NSSAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SST,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SONInformation ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SD
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iE-Extensions
                                                                  iE-Extensions
                                                                                                                                                                                                                                                                                                                                              serving-NID
                                s-NSSAI
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PRESENCE mandatory },
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SuccessfulHandoverReportList ::= SEQUENCE (SIZE(1..maxnoofSuccessfulHOReports)) OF SuccessfulHandoverReport-Item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRITICALITY ignore TYPE SuccessfulHandoverReportList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolExtensionContainer { { SuccessfulHandoverReport-Item-ExtIEs} } OPTIONAL,
                                                             OPTIONAL,
                             OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                        ProtocolIE-SingleContainer { { SONInformationReport-ExtIEs} }
                                                          ProtocolExtensionContainer { {SONInformationReply-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SourceNGRANNode-ToTargetNGRANNode-TransparentContainer ::= SEQUENCE {
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                       XnTNLConfigurationInfo
                                                                                                                                                                                         SONInformationReply-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                                                                                                                                                                                                                                                                                                                                                              HOReport,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           { ID id-SuccessfulHandoverReportList
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SONInformationReply ::= SEQUENCE {
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                                                                                                                                                                                                                                                                                                                              SONInformationReport::= CHOICE {
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                             xnTNLConfigurationInfo
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EXTENSION QMCConfigInfo PRESENCE optional EXTENSION NGAPIESUpportInformationRequestListPRESENCE optional
                                                                  PRESENCE optional
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                                                                                                                                                                             ID id-MBS-ActiveSessionInformation-SourcetoTargetList CRITICALITY ignore EXTENSION MBS-ActiveSessionInformation-SourcetoTargetList
                                                                        EXTENSION UEHistoryInformationFromTheUE
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                                     CRITICALITY ignore EXTENSION SGNB-UE-X2AP-ID
                                                                                                                                           CRITICALITY ignore EXTENSION RAN-UE-NGAP-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The octets of the OCTET STRING are encoded according to the specifications of the target system.
                                                                                                           SourceNodeID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -- This IE includes a transparent container from the source RAN node to the target RAN node.
SourceNGRANNode-ToTargetNGRANNode-TransparentContainer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ProtocolExtensionContainer { {SourceRANNodeID-ExtIEs} } OPTIONAL,
                                                                                                        EXTENSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ProtocolIE-SingleContainer { { SourceNodeID-ExtIEs} }
                                                                     CRITICALITY ignore CRITICALITY ignore
                                                                                                                                                                                                                                                      CRITICALITY ignore
                                                                                                                                                                                                                                                                                           CRITICALITY ignore
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SourceToTarget-AMFInformationReroute-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RejectedNSSAI inPLMN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SourceOfUEActivityBehaviourInformation ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RejectedNSSAlinTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SourceToTarget-TransparentContainer ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SourceToTarget-AMFInformationReroute ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ConfiguredNSSAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SourceRANNodeID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                   { ID id-QMCConfigInfo { ID id-NGAPIESupportInformationRequestList
                                                               ID id-UEHistoryInformationFromTheUE
ID id-SourceNodeID
ID id-UEContextReferenceAtSource
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SourceNodeID-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GlobalGNB-ID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GlobalRANNodeID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        subscription-information,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SourceRANNodeID ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAI,
                                        ID id-SgNB-UE-X2AP-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                   SourceNodeID ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rejectedNSSAlinPLMN
                                                                                                                                                                                                                      PRESENCE optional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rejectedNSSAIinTA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          statistics,
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-- This IE includes information from the source Core node to the target Core node for reroute information provide by NSSF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRESENCE optional PRESENCE optional
                                    -- The octets of the OCTET STRING are encoded according to the specifications of the Core network.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EXTENSION ConfiguredTACIndication EXTENSION RAT-Information
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ProtocolExtensionContainer { {SupportedTAItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SupportedTAList ::= SEQUENCE (SIZE(1..maxnoofTACs)) OF SupportedTAItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRITICALITY ignore
CRITICALITY reject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SupportedTAItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                    RejectedNSSAlinPLMN ::= OCTET STRING (SIZE(32))
                                                                                                                                                                                                                                                                                                              ConfiguredNSSAI ::= OCTET STRING (SIZE(128))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BroadcastPLMNList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                          RejectedNSSAlinTA ::= OCTET STRING (SIZE(32))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Suspend-Response-Indication ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Suspend-Request-Indication ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SurvivalTime ::= INTEGER (0..1920000, ...)
                                                                                                    SRVCCOperationPossible ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           {ID id-ConfiguredTACIndication {ID id-RAT-Information
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SuspendIndicator ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SupportedTAItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SST ::= OCTET STRING (SIZE(1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      suspend-requested,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   suspend-indicated,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    broadcastPLMNList
iE-Extensions
                                                                                                                                                                          notPossible,
                                                                                                                                         possible,
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ProtocolExtensionContainer { {TAIBroadcastEUTRA-Item-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAIBroadcastEUTRA ::= SEQUENCE (SIZE(1..maxnoofTAIforWarning)) OF TAIBroadcastEUTRA-Item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAICancelledEUTRA ::= SEQUENCE (SIZE(1..maxnoofTAIforWarning)) OF TAICancelledEUTRA-Item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TAIBroadcastNR ::= SEQUENCE (SIZE(1..maxnoofTAIforWarning)) OF TAIBroadcastNR-Item
                                                                                                                                                                                           TAC, ProtocolExtensionContainer { {TAI-ExtIEs} } OPTIONAL,
                                                               TACLISTINNRNTN ::= SEQUENCE (SIZE(1..maxnoofTACsinNTN)) OF TAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CompletedCellsInTAI-EUTRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CancelledCellsInTAI-EUTRA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAICancelledEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAIBroadcastEUTRA-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TAIBroadcastNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAI,
                                                                                                                                                                                                                                                                                                                                                                    TAI-ExtIES NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAICancelledEUTRA-Item ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAIBroadcastEUTRA-Item ::= SEQUENCE {
                                                                                                                                                                 PLMNIdentity,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TAIBroadcastNR-Item ::= SEQUENCE { TAI,
TAC ::= OCTET STRING (SIZE(3))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  completedCellsInTAI-EUTRA iE-Extensions Protoc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cancelledCellsInTAI-EUTRA
                                                                                                                                 TAI ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            iE-Extensions
                                                                                                                                                                                                                                iE-Extensions
                                                                                                                                                                 pLMNIdentity
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TAICancelledNR ::= SEQUENCE (SIZE(1..maxnoofTAIforWarning)) OF TAICancelledNR-Item

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ProtocolExtensionContainer { {TAIListForInactiveItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProtocolExtensionContainer { {TAIListForPagingItem-ExtIEs} } OPTIONAL,
                                                                                                                      ProtocolExtensionContainer { {TAICancelledNR-Item-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolExtensionContainer { {TAINSAGSupportItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAIListForInactive ::= SEQUENCE (SIZE(1..maxnoofTAIforInactive)) OF TAIListForInactiveItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAIListForPaging ::= SEQUENCE (SIZE(1..maxnoofTAIforPaging)) OF TAIListForPagingItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAINSAGSupportList ::= SEQUENCE (SIZE(1..maxnoofNSAGS)) OF TAINSAGSupportItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TAIListForRestart ::= SEQUENCE (SIZE(1..maxnoofTAlforRestart)) OF TAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAIListForWarning ::= SEQUENCE (SIZE(1..maxnoofTAIforWarning)) OF TAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAIListForInactiveItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ExtendedSliceSupportList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAIListForPagingItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                           CancelledCellsInTAI-NR,
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                                                                                                                                                                                                                                                                                       TAICancelledNR-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TAINSAGSupportItem ::= SEQUENCE { NSAG-ID,
                                          TAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TAIListForInactiveItem ::= SEQUENCE
TAICancelledNR-Item ::= SEQUENCE {
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                                                                              cancelledCellsInTAI-NR iE-Extensions Pro
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PRESENCE optional
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRESENCE optional },
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolExtensionContainer { {TargetNGRANNode-ToSourceNGRANNode-FailureTransparentContainer-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   { ID id-MBS-ActiveSessionInformation-TargettoSourceList CRITICALITY ignore EXTENSION MBS-ActiveSessionInformation-TargettoSourceList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RRCContainer,
ProtocolExtensionContainer { {TargetNGRANNode-ToSourceNGRANNode-TransparentContainer-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CRITICALITY ignore EXTENSION NGAPIESUpportInformationResponseList
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CRITICALITY ignore EXTENSION DAPSResponseInfoList
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRITICALITY reject TYPE TargetRNC-ID PRESENCE mandatory },
                                                                                                           ProtocolExtensionContainer { { TargeteNB-ID-ExtIEs} } OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TargetNGRANNode-ToSourceNGRANNode-FailureTransparentContainer ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ProtocolIE-SingleContainer { {TargetID-ExtIEs} }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     { ID id-NGAPIESupportInformationResponseList
                                                                                                                                                                                                                                                          TargeteNB-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cell-CAGInformation
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                                                                                                                                                                                                                                                                                                                                                                                                                                               TargetRANNodeID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TargeteNB-ID,
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                                   GlobalNqENB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 { ID id-DAPSResponseInfoList
                                                                    EPS-TAI
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TargeteNB-ID ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {ID id-TargetRNC-ID
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          choice-Extensions
                                                                    selected-EPS-TAI
                                                                                                                                                                                                                                                                                                                                                                                                           TargetID ::= CHOICE
                                                                                                                                                                                                                                                                                                                                                                                                                                            targetRANNodeID
                                                                                                           iE-Extensions
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               iE-Extensions
                                   qlobalENB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      targeteNB-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  _
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-- This IE includes a transparent container from the target RAN node to the source RAN node.
-- The octets of the OCTET STRING are encoded according to the specifications of the target system (if applicable).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ProtocolExtensionContainer { {TargetNSSAIInformation-Item-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The octets of the OCTET STRING are encoded according to the specifications of the target system.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TargetToSource-TransparentContainer ::= OCTET STRING -- This IE includes a transparent container from the target RAN node to the source RAN node.
                                    ProtocolExtensionContainer { {TargetNSSAI-Item-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolExtensionContainer { { TargetRANNodeID-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRITICALITY ignore EXTENSION NR-CGI PRESENCE optional },
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProtocolExtensionContainer { {TargetRNC-ID-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TargetNSSAIInformation-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TargettoSource-Failure-TransparentContainer ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TargetRANNodeID-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                     TargetNSSAI-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TargetRNC-ID-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TimerApproachForGUAMIRemoval ::= ENUMERATED {
                                                                                                                                                                                                                                                                                                                                                                                 TargetNSSAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GlobalRANNodeID,
                                                                                                                                                                                                                                                                                                                                                                                                                     IndexToRFSP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ExtendedRNC-ID
                                                                                                                                                                                                                                                                                                                                      TargetNSSAIInformation ::= SEQUENCE {
   S-NSSAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RNC-ID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TargetRANNodeID ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TAI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TargetRNC-ID ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                globalRANNodeID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  extendedRNC-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 {ID id-NR-CGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     iE-Extensions
                                       iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                      iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     apply-timer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       selectedTAI
                                                                                                                                                                                                                                                                                                                                                                                                                     indexToRFSP
                                                                                                                                                                                                                                                                                                                                                                                 targetNSSAI
s-NSSAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           rNC-ID
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uUTimeSyncErrorBudget INTEGER (1..1000000, ...)
-- The above IE shall be present if the Time Distribution Indication IE is set to the value "enabled"
iE-Extensions ProtocolExtensionContainer { {TimeSyncAssistanceInfo-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolExtensionContainer { {TMLAssociationItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TNLAssociationList ::= SEQUENCE (SIZE(1..maxnoofTNLAssociations)) OF TNLAssociationItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BIT STRING (SIZE(32, ...)),
ProtocolIE-SingleContainer { {TNGF-ID-ExtIEs} }
                                                                                                          ENUMERATED {enabled, disabled, ...},
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TimeToWait ::= ENUMERATED {vls, v2s, v5s, v10s, v20s, v60s, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TimeUEStayedInCellEnhancedGranularity ::= INTEGER (0..40950)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CPTransportLayerInformation,
                                                                                                                                                                                                                                                                                                                                                                                 TimeSyncAssistanceInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TNLAssociationItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TNLAddressWeightFactor ::= INTEGER (0..255)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TimeUEStayedInCell ::= INTEGER (0..4095)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TNGF-ID-ExtIES NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cause,
                                                                         TimeSyncAssistanceInfo ::= SEQUENCE { timeDistributionIndication E
TimeStamp ::= OCTET STRING (SIZE(4))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TNLAssociationUsage ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OCTET STRING (SIZE(6))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNAP-ID ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 choice-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TNGF-ID ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tNGF-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         non-ue,
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PRESENCE optional PRESENCE optional
                                                                                                                                                                                                                   OPTIONAL,
                                                                                                                                                         NGRAN-CGI,
UERLFReportContainer OPTIONAL,
ProtocolExtensionContainer { { TooearlyIntersystemHO-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .YIPAddress TransportLayerAddress,
ProtocolExtensionContainer { {TraceActivation-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ProtocolExtensionContainer { {TAIBasedMDT-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EXTENSION MDT-Configuration EXTENSION URI-address
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRITICALITY ignore
CRITICALITY ignore
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterfacesToTrace,
                                                                                                                                                                                                                                                                                                                      TooearlyIntersystemHO-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TransportLayerAddress ::= BIT STRING (SIZE(1..160, ...))
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGRANTraceID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TraceActivation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TraceDepth,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TrafficLoadReductionIndication ::= INTEGER (1..99)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TAIListforMDT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   minimumWithoutVendorSpecificExtension,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     maximumWithoutVendorSpecificExtension,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mediumWithoutVendorSpecificExtension,
                                                                                                       TooearlyIntersystemHO::= SEQUENCE { sourcecellID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      { ID id-MDTConfiguration { ID id-TraceCollectionEntityURI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        traceCollectionEntityIPAddress
                                                                                                                                                                                                                                                                                                                                                                                                                                TraceActivation ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TypeOfError ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAIBasedMDT ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TraceDepth ::= ENUMERATED
                                                                                                                                                                                       UERLFReportContainer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        interfacesToTrace
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  not-understood,
                                                                                                                                                                                                             iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    iE-Extensions
                                                                                                                                                             failurecellID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tAIListforMDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        iE-Extensions
                                                                                                                                   sourcecellID
                                                                                                                                                                                                                                                                                                                                                                                                                                                               nGRANTraceID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  traceDepth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        minimum,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              missing,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           maximum,
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both,
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TimeToTrigger ::= ENUMERATED {ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256, ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560, ms5120}
                                                                                                                                                                                                                                                                                             ProtocolExtensionContainer { {TAIBasedQMC-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolExtensionContainer { {TABasedQMC-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ProtocolExtensionContainer { {TABasedMDT-ExtIEs} } OPTIONAL,
                                                                                                                                                TAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAIListforQMC ::= SEQUENCE (SIZE(1..maxnoofTAforQMC)) OF TAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TALISTFOROMC ::= SEQUENCE (SIZE(1..maxnoofTAforoMC)) OF TAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAListforMDT ::= SEQUENCE (SIZE(1..maxnoofTAforMDT)) OF TAC
                                                                                                                                             TAIListforMDT ::= SEQUENCE (SIZE(1..maxnoofTAforMDT)) OF
TAIBasedMDT-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAIBasedQMC-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TABasedQMC-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TABASEdMDT-ExtIES NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                      TAIListforQMC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TAListforQMC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TAListforMDT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Threshold-RSRQ ::= INTEGER(0..127)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Threshold-SINR ::= INTEGER(0..127)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Threshold-RSRP ::= INTEGER(0..127)
                                                                                                                                                                                                                     TAIBasedQMC ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TABasedQMC ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TABasedMDT ::= SEQUENCE
                                                                                                                                                                                                                                                                                             iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  iE-Extensions
                                                                                                                                                                                                                                                               tAIListforQMC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          iE-Extensions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tAListforQMC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tAListforMDT
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PRESENCE optional },
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolExtensionContainer { {UEAggregateMaximumBitRate-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ProtocolExtensionContainer { { UEAppLayerMeasInfoItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       UEAppLayerMeasInfoList ::= SEQUENCE (SIZE(1..maxnoofUEAppLayerMeas)) OF UEAppLayerMeasInfoItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProtocolExtensionContainer { {TSCTrafficCharacteristics-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolExtensionContainer { {TSCAssistanceInformation-ExtIEs} }
                                                                                                              ProtocolIE-SingleContainer { {TWIF-ID-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TSCTrafficCharacteristics-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                UEAppLayerMeasConfigInfo,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UEAggregateMaximumBitRate-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TSCAssistanceInformation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TSCAssistanceInformation
                                                                                    BIT STRING (SIZE(32, ...)),
                                                                                                                                                                                                                                                                                                                                                                                          BurstArrivalTime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BitRate,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BitRate,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    UEAggregateMaximumBitRate ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TSCTrafficCharacteristics ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                Periodicity,
                                                                                                                                                                                                                                                                                                                              TSCAssistanceInformation ::= SEQUENCE {
                                                                                                                                                                                                            TWIF-ID-ExtIES NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UEAppLayerMeasInfoItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     uEAggregateMaximumBitRateDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  uEAqqreqateMaximumBitRateUL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tSCAssistanceInformationDL
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TWAP-ID ::= OCTET STRING
                                                                                                                   choice-Extensions
                                                       TWIF-ID ::= CHOICE {
                                                                                                                                                                                                                                                                                                                                                                                          burstArrivalTime
                                                                                                                                                                                                                                                                                                                                                                                                                  iE-Extensions
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                                                                                         LWIF-ID
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UE-associatedLogicalNG-connectionList ::= SEQUENCE (SIZE(1..maxnoofNGConnectionsToReset)) OF UE-associatedLogicalNG-connectionItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OPTIONAL,
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                                                                                                                                                                                                                                                                           OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                             OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ProtocolExtensionContainer { { UEAppLayerMeasConfigInfo-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                          AvailableRANVisibleQoEMetrics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              UE-associatedLogicalNG-connectionItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                      OCTET STRING (SIZE(1..8000))
                                                                                                                                                                                                                                                                           ENUMERATED {ongoing,...}
                                                                                                                                                                                                                                                                                                                                     INTEGER (0..15, ...)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UEContextResumeRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                TransportLayerAddress,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QosFlowListWithCause
                                                                                                                                                                                                                                                                                                                                                                     SliceSupportListQMC
                                                                                                                                                                                                                                                                                                                                                                                                    MDT-AlignmentInfo
                                                                                                                                                      OoEReference,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UEAppLayerMeasConfigInfo-ExtIEs NGAP-PROTOCOL-EXTENSION::= {
                                                                                                                                                                                                              AreaScopeOfQMC,
UEAppLayerMeasInfoItem-ExtIEs NGAP-PROTOCOL-EXTENSION::= {
                                                                                                                                                                                        ServiceType,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UE-associatedLogicalNG-connectionItem ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       UEContextRequest ::= ENUMERATED {requested, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UEContextResumeRequestTransfer ::= SEQUENCE
                                                                                                                         UEAppLayerMeasConfigInfo ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UECapabilityInfoRequest ::= ENUMERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AMF-UE-NGAP-ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RAN-UE-NGAP-ID
                                                                                                                                                                                                                                                                                                      containerForAppLayerMeasConfig
                                                                                                                                                                                                                                                                                                                                                                                                                             availableRANVisibleQoEMetrics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gosFlowFailedToResumeList
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                                                                                                                                                                                                                                                                                                                                        measConfigAppLayerID
                                                                                                                                                                                                                                                                           qoEMeasurementStatus
                                                                                                                                                                                                                                                                                                                                                                       sliceSupportListQMC
                                                                                                                                                                                                                                                                                                                                                                                                    mDT-AlignmentInfo
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                                                                                                                                                                                                              areaScopeOfQMC
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                                                                                                                                                           qoEReference
                                                                                                                                                                                        serviceType
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       requested,
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ENUMERATED {battery-powered, battery-powered-not-rechargeable-or-replaceable, not-battery-powered, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ENUMERATED {single-packet, dual-packets, multiple-packets, ...} OPTIONAL,
                                          OPTIONAL,
                                                                        OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        ProtocolExtensionContainer { {UEContextSuspendRequestTransfer-ExtIEs} }
                                                                           ProtocolExtensionContainer { {UEContextResumeResponseTransfer-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UEHistoryInformation ::= SEQUENCE (SIZE(1..maxnoofCellsinUEHistoryInfo)) OF LastVisitedCellItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolIE-SingleContainer { {UEIdentityIndexValue-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENUMERATED {periodically, ondemand, ... }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENUMERATED {stationary, mobile, ...}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             UEContextSuspendRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                UEContextResumeResponseTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                       QosFlowListWithCause
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ScheduledCommunicationTime
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTEGER (1..3600, ...)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       UE-DifferentiationInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                                                                                                   SuspendIndicator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NRMobilityHistoryReport,
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   indexLength10
   BIT STRING (SIZE(10)),
UEContextResumeResponseTransfer ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                                                               UEContextSuspendRequestTransfer ::= SEQUENCE {
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                                          gosFlowFailedToResumeList
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                                                                              iE-Extensions
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UEPresence,
ProtocolExtensionContainer { (UEPresenceInAreaOfInterestItem-ExtIEs) } OPTIONAL,
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OPTIONAL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ProtocolExtensionContainer { {UE-NGAP-ID-pair-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ProtocolIE-SingleContainer { {UEPagingIdentity-ExtIEs} }
                                                                                                                                                                                                                                ProtocolIE-SingleContainer { {UE-NGAP-IDs-ExtIEs} }
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UERadioCapabilityForPagingOfEUTRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LocationReportingReferenceID,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UE-NGAP-ID-pair-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
UEIdentityIndexValue-ExtIEs NGAP-PROTOCOL-IES ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            UEPresence ::= ENUMERATED {in, out, unknown, ...}
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                UEPresenceInAreaOfInterestItem ::= SEQUENCE {
                                                                                                                                                                                                                                                                                                                                  UE-NGAP-IDS-ExtIES NGAP-PROTOCOL-IES ::=
                                                                                                                                                              UE-NGAP-ID-pair,
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                                                                                                                                                                                           AMF-UE-NGAP-ID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RAN-UE-NGAP-ID,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                locationReportingReferenceID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UE-NGAP-ID-pair ::= SEQUENCE{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UEPagingIdentity ::= CHOICE {
                                                                                                                                 UE-NGAP-IDS ::= CHOICE
                                                                                                                                                                                                                                choice-Extensions
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PRESENCE optional },
                                                                                                                                                                                      CRITICALITY ignore EXTENSION UERadioCapabilityForPagingOfNB-IOT
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ProtocolExtensionContainer { {UERadioCapabilityForPaging-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ProtocolExtensionContainer { { UESliceMaximumBitRateItem-ExtIEs} } OPTIONAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProtocolExtensionContainer { {UESecurityCapabilities-ExtIEs} } OPTIONAL,
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                                                                                                                                                    UERadioCapabilityForPaging-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      UESecurityCapabilities-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
                                                                                                                                                                                                                                                                                                                                           UERadioCapabilityForPagingOfNB-IoT ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                UERadioCapabilityForPagingOfEUTRA ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         UERLFReportContainer-ExtIEs NGAP-PROTOCOL-IES ::=
                                                                                                                                                                                                                                                                                                                                                                                                                       UERadioCapabilityForPagingOfNR ::= OCTET STRING
                                                                                                                                                                                         { ID id-UERadioCapabilityForPagingOfNB-IoT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LTEUERLFReportContainer,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         UERadioCapabilityID ::= OCTET STRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UESecurityCapabilities ::= SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nRintegrityProtectionAlgorithms
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           eUTRAencryptionAlgorithms
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UESliceMaximumBitRateItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

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UE-UP-CIOT-Support ::= ENUMERATED {supported, ...}
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                                                                                                                                     UL-NAS-Count,
                                                                                            UL-NAS-MAC,
                                                                 ::= SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                               UL-NAS-MAC ::= BIT STRING (SIZE (16))
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UpdateFeedback ::= BIT STRING (SIZE(8, ...))
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                                                                       UserLocationInformation ::= CHOICE
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ProtocolExtensionContainer { {UserLocationInformationEUTRA-ExtIEs} }
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   globalLine-ID GlobalLine-ID,
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INTEGER (0..18446744073709551615),
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    startTimeStamp
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProtocolIE-SingleContainer { {WarningAreaList-ExtIEs} }
BIT STRING (SIZE(16, ...)),
ProtocolIE-SingleContainer { {W-AGF-ID-ExtIEs} }
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                                                                                                                                                                                                                                                     WarningAreaCoordinates ::= OCTET STRING (SIZE(1..1024))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WLANMeasConfigNameList ENUMERATED {true, ...}
                                                                                                                                                                                                                                                                                                                                                                                                             TAIListForWarning,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WarningSecurityInfo ::= OCTET STRING (SIZE(50))
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WarningAreaList-ExtIEs NGAP-PROTOCOL-IES ::= {
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                                                                                                                            W-AGF-ID-ExtIES NGAP-PROTOCOL-IES ::= {
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                                                                                                                                                                                                                                                                                                                                           eUTRA-CGIListForWarning
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  W-AGF-ID
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ProtocolExtensionContainer { { WUS-Assistance-Information-ExtIEs } } OPTIONAL,
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ProtocolExtensionContainer { {XnExtTLA-Item-ExtIEs} }
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  XnGTP-TLAS ::= SEQUENCE (SIZE(1..maxnoofXnGTP-TLAS)) OF TransportLayerAddress
                                                                               PagingProbabilityInformation,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XnTLAs ::= SEQUENCE (SIZE(1..maxnoofXnTLAs)) OF TransportLayerAddress
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                                                                                                                                                                                                                                                                                                                                                                                                         XNEXtTLAS ::= SEQUENCE (SIZE(1..maxnoofXnExtTLAS)) OF XNExtTLA-1tem
                                                                                                                                                                                                                            WUS-Assistance-Information-ExtIEs NGAP-PROTOCOL-EXTENSION ::=
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                                                       WUS-Assistance-Information ::= SEQUENCE {
WLANName ::= OCTET STRING (SIZE (1..32))
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                                                                                 pagingProbabilityInformation
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## 9.4.6 Common Definitions

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::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome }
                                                                                                                                                                                    NGAP-CommonDataTypes { itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-CommonDataTypes (3) }
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    INTEGER (0..65535),
    OBJECT IDENTIFIER
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                                                                             -- Common definitions
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## 9.4.7 Constant Definitions

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                                 -- IE parameter types from other modules.
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id-LocationReportingFailureIndication
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    id-PDUSessionResourceModifyIndication
                                                                                                                                                                                                                                                                                                                                                                                                                                                   id-DownlinkUEAssociatedNRPPaTransport
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                                                                                                                                                              FROM NGAP-CommonDataTypes;
                                                                                                                                                                                                                                                                                                                  id-AMFConfigurationUpdate
                                                                                                                                                                                                                                                 -- Elementary Procedures
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-- Lists

| GER ::= 8 GER ::= 64 GER ::= 16 GER ::= 16 GER ::= 16 GER ::= 256 GER ::= 1024 GER ::= 1024 GER ::= 16 | INTEGER= 8 ************************************     | ProtocolIE-ID ::= 0 ProtocolIE-ID ::= 1 ProtocolIE-ID ::= 2 ProtocolIE-ID ::= 3 ProtocolIE-ID ::= 5 ProtocolIE-ID ::= 5 ProtocolIE-ID ::= 6 ProtocolIE-ID ::= 7 ProtocolIE-ID ::= 9 ProtocolIE-ID ::= 9 ProtocolIE-ID ::= 10 ProtocolIE-ID ::= 11                                                                                                              |
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| NATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | maxnoofTAforQMC  ********************************** | id-AllowedNSSAI id-AMFName id-AMFOVELD id-AMFSECTID id-AMF-TNLASSOCIATIONFAILEDTIST id-AMF-TNLASSOCIATIONSETUPLIST id-AMF-TNLASSOCIATIONTOADGLIST id-AMF-TNLASSOCIATIONTOADGLIST id-AMF-TNLASSOCIATIONTOADGLIST id-AMF-TNLASSOCIATIONTOUPDATELIST id-AMF-TNLASSOCIATIONTOUPDATELIST id-AMF-UE-NGAP-ID id-ASSISTANGEDBTAFOTPAGING id-BroadcastCancelledAreaList |

ETSI

### 540

| id-BroadcastCompletedAreaList                                                               | ProtocoliE-ID ::= 13 |
|---------------------------------------------------------------------------------------------|----------------------|
| id-CancelAllWarningMessages                                                                 | ProtocolIE-ID ::= 14 |
| id-Cause                                                                                    | ProtocoliE-ID ::= 15 |
| id-CellIDListForRestart                                                                     | :<br>:-              |
| id-ConcurrentWarningMessageInd                                                              | ProtocolIE-ID ::= 17 |
| id-CoreNetworkAssistanceInformationForInactive                                              | :<br>:-              |
| id-CriticalityDiagnostics                                                                   | <br>••               |
| id-DataCodingScheme                                                                         | <br>••               |
| id-DefaultPagingDRX                                                                         | ::<br>::             |
| id-DirectForwardingPathAvailability                                                         | ::<br>::             |
| id-EmergencyAreaIDListForRestart                                                            | ProtocolIE-ID ::= 23 |
| id-EmergencyFallbackIndicator                                                               | <br>••               |
| id-EUTRA-CGI                                                                                | <br>••               |
| id-FiveG-S-TMSI                                                                             | ProtocolIE-ID ::= 26 |
| id-GlobalRANNodeID                                                                          | ProtocolIE-ID ::= 27 |
| id-GUAMI                                                                                    | ProtocolIE-ID ::= 28 |
| id-HandoverType                                                                             | ProtocoliE-ID ::= 29 |
| id-IMSVoiceSupportIndicator                                                                 | ::<br>::             |
| id-IndexToRFSP                                                                              | <br>••               |
| id-InfoOnRecommendedCellsAndRANNodesForPaging                                               | ::<br>::             |
| id-LocationReportingRequestType                                                             | ::<br>::             |
| id-MaskedIMEISV                                                                             | <br>                 |
| id-MessageIdentifier                                                                        | ::<br>::             |
| id-MobilityRestrictionList                                                                  | ::<br>::             |
| id-NASC                                                                                     | ::<br>::             |
| id-NAS-PDU                                                                                  | <br>••               |
| id-NASSecurityParametersFromNGRAN                                                           | ::                   |
| id-NewAMF-UE-NGAP-ID                                                                        | ::                   |
| id-NewSecurityContextInd                                                                    | ::<br>::             |
| id-NGAP-Message                                                                             | ProtocolIE-ID ::= 42 |
| id-ngran-cgi                                                                                | <br>••               |
| id-NGRANTraceID                                                                             | <br>••               |
| id-NR-CGI                                                                                   | ::                   |
| id-NRPPa-PDU                                                                                | <br>                 |
| id-NumberOfBroadcastsRequested                                                              | <br>••               |
| id-OldaMF                                                                                   | ::                   |
| id-OverloadStartNSSAIList                                                                   | <br>••               |
| ıd-PagıngDRX                                                                                | <br>••               |
| ıd-Pagıngorıgın                                                                             | <br>••               |
| id-PagingFriority                                                                           | <br>                 |
| id boigongion boson.ceAdmitteabist                                                          | Protocolie in 53     |
| id DDHSoggioupogomage; logucomores                                                          |                      |
| id-FuodessionDesourceraliediosecupaisconches<br>id-DDHsessionDesourceRailedHoSeturiis+HONab |                      |
| id-FDUSessionResourceFailedToSetupListEORc<br>id-PDUSessionResourceFailedToSetupListPSRed   | : ::                 |
| id-PDHSessionResourceFailedToSetupListSHRes                                                 |                      |
| id-PDUSessionResourceHandoverList                                                           |                      |
| id-PDUSessionResourceListCxtRelCpl                                                          | <br>••               |
| id-PDUSessionResourceListHORqd                                                              | ProtocolIE-ID ::= 61 |
| id-PDUSessionResourceModifyListModCfm                                                       | ProtocolIE-ID ::= 62 |
| id-PDUSessionResourceModifyListModInd                                                       | ::                   |
| id-PDUSessionResourceModifyListModReg                                                       | 9 =::                |
| id-PDUSessionResourceModityListModRes                                                       |                      |
| 1d-PDUSessionKesourceNotifyList                                                             | ProtocollE-1D ::= 66 |

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| + C C C C C C C C C C C C C C C C C C C                                                | CC1 GT HT (           |
|----------------------------------------------------------------------------------------|-----------------------|
| id WarmingAreanisc                                                                     |                       |
| td-Wat ii tiigmessagecoii ceii cs                                                      |                       |
| id Warningsecuricyinto                                                                 | Procedire ID :: 124   |
| IG-WGLILLIGIYDE<br>id-addi+ionalIII-NGII-ID-ANIIInformation                            |                       |
| id-DataForwardingNot Dossible                                                          | 12                    |
| id-DL-NGU-UP-TNLInformation                                                            | ::= 1                 |
| id-NetworkInstance                                                                     | ::= 12                |
| id-PDUSessionAggregateMaximumBitRate                                                   | ProtocolIE-ID ::= 130 |
| id-PDUSessionResourceFailedToModifyListModCfm                                          | ProtocolIE-ID ::= 131 |
| id-PDUSessionResourceFailedToSetupListCxtFail                                          | ProtocolIE-ID ::= 132 |
| id-PDUSessionResourceListCxtRelReq                                                     | ProtocolIE-ID ::= 133 |
| id-PDUSessionType                                                                      | ::= 13                |
| id-QosFlowAddOrModifyRequestList                                                       | ::= 1                 |
| id-QosFlowSetupRequestList                                                             | ProtocolIE-ID ::= 136 |
| id-QosFlowToReleaseList                                                                | ProtocolIE-ID ::= 137 |
| id-SecurityIndication                                                                  | ProtocolIE-ID ::= 138 |
| id-UL-NGU-UP-TNLInformation                                                            | := 1                  |
| id-UL-NGU-UP-TNLModifyList                                                             | ProtocolIE-ID ::= 140 |
| id-WarningAreaCoordinates                                                              | ::<br>::              |
| id-PDUSessionResourceSecondaryRATUsageList                                             | := 1                  |
| id-HandoverFlag                                                                        | ::= 14                |
| id-SecondaryRATUsageInformation                                                        | <br>                  |
| id-PDUSessionResourceReleaseResponseTransfer                                           | ::<br>::              |
| id-RedirectionVoiceFallback                                                            | ::<br>::              |
| id-UERetentionInformation                                                              | ProtocolIE-ID ::= 147 |
| id-S-NSSAI                                                                             | ProtocolIE-ID ::= 148 |
| id-PSCellInformation                                                                   | ProtocolIE-ID ::= 149 |
| id-LastEUTRAN-PLMNIdentity                                                             | ProtocolIE-ID ::= 150 |
| id-MaximumIntegrityProtectedDataRate-DL                                                | ProtocolIE-ID ::= 151 |
| id-AdditionalDLForwardingUPTNLInformation                                              | ::= 1                 |
| id-AdditionalDLUPTNLInformationForHOList                                               | ProtocolIE-ID ::= 153 |
| id-AdditionalNGU-UP-TNLInformation                                                     | ProtocolIE-ID ::= 154 |
| id-AdditionalDLQosFlowPerTNLInformation                                                | ::= 1                 |
| id-SecurityResult                                                                      | := 1                  |
| id-ENDC-SONConfigurationTransferDL                                                     | ProtocolIE-ID ::= 157 |
| id-ENDC-SONConfigurationTransferUL                                                     | ::= 1                 |
| id-OldAssociatedQosFlowList-ULendmarkerexpected                                        | ::<br>::              |
| id-CNTypeRestrictionsForEquivalent                                                     | <br>                  |
| id-CNTypeRestrictionsForServing                                                        | <br>••                |
| ld-NewGUAMI                                                                            | <br>                  |
| ld-ULForwarding                                                                        | <br>••                |
| id-ULForwardingUP-TNLInformation                                                       |                       |
| id-CNAssistedRANTuning                                                                 | <br>••                |
| id-CommonNetworkInstance                                                               | <br>••                |
| id-NGRAN-TNLAssociationToRemoveList                                                    | <br>                  |
| id-ThlassociationTransportLayerAddressNGRAN                                            | 9T =::                |
| id TocationDomoutimediations) The                                                      | Protocolie-iu ::= 169 |
| id-bocacionneporcingAddicionalinio                                                     |                       |
| id-bourcerolarger-AMFINILOIMBCLONKEroure<br>id-bdditionalNT-RowardindNPTNT.Information |                       |
| id-Additionalurkorwardingurinininimation<br>id-scmp-mias                               |                       |
| id-SelectedPLMNIdentitv                                                                |                       |
| id-RIMInformationTransfer                                                              | ::= 17                |

| id-GUAMIType                                                            | ProtocoliE-ID ::= 176                          |
|-------------------------------------------------------------------------|------------------------------------------------|
| id-SRVCCOperationPossible                                               | ProtocolIE-ID ::= 177                          |
| id-TargetRNC-ID                                                         | ProtocoliE-ID ::= 178                          |
| id-RAT-Information                                                      | ⊪<br>••                                        |
| id-ExtendedRATRestrictionInformation                                    | <br>••                                         |
| la-Vosmonitoringkequest<br>id-Sanb-IIF-x2ab-in                          | ProtocollE-ID ::= 181 ProtocolTE-ID ::= 182    |
| id-AdditionalRedundantDL-NGU-UP-TNLInformation                          |                                                |
| id-AdditionalRedundantDLQosFlowPerTNLInformation                        | ::                                             |
| id-AdditionalRedundantNGU-UP-TNLInformation                             | <br>                                           |
| id-AdditionalRedundantUL-NGU-UP-TNLInformation                          |                                                |
| ta-CNFacketDetaybuagetDL<br>id-CNPacketDelavBudaetUT.                   | Protocolif-ID ::= 18/<br>Protocolif-ID ::= 188 |
| id-ExtendedPacketDelayBudget                                            |                                                |
| id-RedundantCommonNetworkInstance                                       | <br>                                           |
| id-RedundantDL-NGU-TNLInformationReused                                 | <br>                                           |
| id-RedundantDL-NGU-UP-TNLInformation                                    | ProtocolIE-ID ::= 192                          |
| td-kedundantObbgOsrtOwFeIINbIntOIMaCION<br>id-RedindantOosFlowTndicator | Protocolte-ID ::= 193                          |
| id-RedundantUL-NGU-UP-TNLInformation                                    | ::                                             |
| id-TSCTrafficCharacteristics                                            | ProtocolIE-ID ::= 196                          |
| id-RedundantPDUSessionInformation                                       | :<br>:-                                        |
| id-UsedRSNInformation                                                   | ⊪<br>••                                        |
| id-IAB-Authorized                                                       | <br>••                                         |
| ld-IAB-Supported                                                        | <br>                                           |
| ld-IAbnodeIndication<br>id mp tom nogingaps                             | ProtocollE-ID ::= 201                          |
| td-inb-ioi-Fayingbra<br>id-NB-IoT-Paging-eDRXInfo                       | ! !!                                           |
| id-NB-IoT-DefaultPaqingDRX                                              |                                                |
| id-Enhanced-CoverageRestriction                                         | ⊪<br>••                                        |
| id-Extended-ConnectedTime                                               | ::<br>::                                       |
| id-PagingAssisDataforCEcapabUE                                          | ⊪<br>••                                        |
| id-WUS-Assistance-Information                                           | <br>••                                         |
| id-UE-DifferentiationInfo                                               | <br>••                                         |
| id-NB-IOT-UEPriority                                                    | . !                                            |
| ld-UL-CP-securityiniormation<br>id-Di-CP-securityinformation            | ProtocoliE-ID ::= 211 ProtocoliE-ID ::= 212    |
| id-TAI                                                                  | : ::                                           |
| id-UERadioCapabilityForPagingOfNB-IoT                                   | ProtocoliE-ID ::= 214                          |
| id-LTEV2XServicesAuthorized                                             | :<br>::                                        |
| id-NRV2XServicesAuthorized                                              | <br>                                           |
| id-LTEUESidelinkAggregateMaximumBitrate                                 | ⊪<br>••                                        |
| id-NRUESidelinkAggregateMaximumBitrate                                  | <br>••<br>••                                   |
| Id-FCSQOSFarameters<br>id altornativoOccoarscottist                     | ProtocollE-ID ::= 219                          |
| ta-micerinativegon arabetars c<br>id-CurrentOoSParaSetIndex             | • •                                            |
| id-CEmodeBrestricted                                                    |                                                |
| id-EUTRA-PagingeDRXInformation                                          | ::= 2                                          |
| id-CEmodeBSupport-Indicator                                             | <br>••                                         |
| id-LTEM-Indication                                                      | <br>                                           |
| id-EndIndication                                                        | ProtocolIE-ID ::= 226                          |
| IQ-EDI-SESSIOII<br>id-IIECapahilitvInfoReqiest                          | ProtocollE-ID ::= 22/                          |
| id-bucapability.<br>id-PDUSessionResourceFailedToResumeListRESReg       | ProtocoliE-ID ::= 229                          |
|                                                                         |                                                |

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| id-PDUSessionResourceFailedToResumeListRESRes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | $\sim$                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| id-PDUSessionResourceSuspendListSUSReq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ::= 23                                         |
| id-PDUSessionResourceResumeListRESReq                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ::= 23                                         |
| id-PDUSessionResourceResumeListRESRes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ::= 23                                         |
| 1d-UE-UP-CIOT-Support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | := 23                                          |
| id-Suspend-Request-Indication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ::= 23                                         |
| id-Suspend-Response-Indication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ::= 23                                         |
| 1d-RRC-Resume-Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | = :                                            |
| 1d-KGLeVelWirelineAccesscharacteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ::= 23                                         |
| id-W-AGFIdentityInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | = 5                                            |
| ld-GloballNGF-ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | .:= 24                                         |
| 1d-GIODALIWIF-ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ProtocollE-ID ::= 241                          |
| IQ-GIODAIW-RGE-ID<br>id-HaorI.ocationInformationW-AGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | #7 -::<br>PC =::                               |
| id-UserLocationInformationFNGF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | := 24                                          |
| id-AuthenticatedIndication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ::= 24                                         |
| id-TNGFIdentityInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ⊪<br>••                                        |
| id-TWIFIdentityInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ::= 24                                         |
| id-UserLocationInformationTWIF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | := 2                                           |
| id-DataForwardingResponseERABList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <br>••                                         |
| 1d-IntersystemSONCOnilgurationTransferUL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 7 (                                            |
| IQ-INCELSYSCEMBONCONITIQUIACIONITANISTEIOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Protocolie ID :: 231                           |
| IQ-EQUATION TO CONTRACTOR CONTRACTOR FOR THE CONTRACTOR FOR FOR THE CONTRACTOR FOR FOR FOR FOR FOR FOR FOR FOR FOR F | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1       |
| id_Managemen+BasedMhTPT.MNT.is+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <br>                                           |
| id-MDTConfiguration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |
| id_DrivacvTndicator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |
| id-TraceCollectionEntityURI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ProtocoliE-ID ::= 257                          |
| id-NPN-Support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ::= 2                                          |
| id-NPN-AccessInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ProtocolIE-ID ::= 259                          |
| id-NPN-PagingAssistanceInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ::= 26                                         |
| id-NPN-MobilityInformation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <br>••                                         |
| id-TargettoSource-Failure-TransparentContainer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ::= 26                                         |
| id-NID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ::                                             |
| id-UERadioCapabilityID<br>id menadioCamahilit emmna namat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ProtocollE-ID ::= 264                          |
| IG-UERAGIOCAPADILICY-EUIRA-FOLMAC<br>:d-Dadebembettnfo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | . :                                            |
| id-DAPSResponseInfoList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | : ::                                           |
| id-EarlyStatusTransfer-TransparentContainer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ::                                             |
| id-NotifySourceNGRANNode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | E-ID                                           |
| id-ExtendedSliceSupportList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ::<br>::                                       |
| id-ExtendedTAISliceSupportList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |
| id-ConfiguredTACIndication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ::<br>::                                       |
| 1d-Extended-KANNodename<br>id-Extended-AMFName                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ProtocollE-ID ::= 2/3 ProtocollE-ID ::= 274    |
| id-GlobalCable-ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | := 27                                          |
| id-QosMonitoringReportingFrequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                |
| id-QosFlowParametersList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | E-ID                                           |
| id-QosFlowFeedbackList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ::<br>::                                       |
| id-BurstArrivalTimeDownlink                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ::= 27                                         |
| id-ExtendedUEldentityIndexvalue<br>id-DdnSessionExpertedNEActivityBebavionr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ProtocollE-ID ::= 280<br>ProtocollE-ID ::= 281 |
| id-MicoAllPLMN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 282                                            |
| id-QosFlowFailedToSetupList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ProtocolIE-ID ::= 283                          |

| id-SourcemM.AddrInfo                                       | ProtogolIE-ID ::= 284 |
|------------------------------------------------------------|-----------------------|
| id-ExtendedRenortIntervalMDT                               | 285                   |
| id-SourceNodeTD                                            | 28 = 28               |
| id-NRNTNTAIInformation                                     | ::= 28                |
| id-UEContextReferenceAtSource                              | ::= 2                 |
| id-LastVisitedPSCellList                                   | $\infty$              |
| id-IntersystemSONInformationRequest                        | 6                     |
| id-IntersystemSONInformationReply                          | ::= 29                |
| id-EnergySavingIndication                                  | ::= 29                |
| id-IntersystemResourceStatusUpdate                         | ::= 29                |
| id-SuccessfulHandoverReportList                            | ::= 29                |
| id-MBS-AreaSessionID                                       | := 2                  |
| id-MBS-QoSFlowsToBeSetupList                               | ::= 29                |
| id-MBS-QoSFlowsToBeSetupModList                            | ::<br>::              |
| id-MBS-ServiceArea                                         | 6                     |
| id-MBS-SessionID                                           | ::<br>::              |
| id-MBS-DistributionReleaseRequestTransfer                  | ::<br>::              |
| id-MBS-DistributionSetupRequestTransfer                    | <br>                  |
| id-MBS-DistributionSetupResponseTransfer                   | ::= 30                |
| id-MBS-DistributionSetupUnsuccessfulTransfer               | Ⅱ<br>••               |
| id-MulticastSessionActivationRequestTransfer               | <br> -                |
| id-MulticastSessionDeactivationRequestTransfer             | <br> -                |
| id-MulticastSessionUpdateRequestTransier                   | <br>••                |
| id-MulticastGroupPagingAreaList                            | <br> -                |
| id-MBS-SupportIndicator                                    | ::<br>::              |
| id-MBSSessionFailedtoSetupList                             | ::<br>::              |
| id-MBSSessionFailedtoSetuporModifyList                     | ::= 31                |
| id-MBSSessionSetupResponseList                             | <br> -                |
| id-MBSSessionSetuporModifyResponseList                     | ⊪<br>••               |
| id-MBSSessionSetupFailureTransfer                          | ::= 31                |
| id-MBSSessionSetupRequestTransfer                          | ::<br>::              |
| id-MBSSessionSetupResponseTransfer                         | <br>••                |
| id-MBSSessionToReleaseList                                 | ::                    |
| id-MBSSessionSetupRequestList                              | ::                    |
| id-MBSSessionSetuporModifyRequestList                      | ::= 31                |
| id-MBS-ActiveSessionInformation-SourcetoTargetList         | <br>••                |
| id-MBS-ActiveSessionInformation-TargettoSourceList         | <br>••                |
| id-OnboardingSupport                                       | <br>••                |
| id-TimeSyncAssistanceInto                                  |                       |
| IQ-SULVIVALITME                                            | 128 =::               |
| IA-QMCCOILIGILLO                                           | 2 2                   |
| id-PhisessionDairth                                        |                       |
| id-NR-PagingeDRXInformation                                |                       |
| id-RedCapIndication                                        |                       |
| id-TargetNSSAIInformation                                  | ::= 3                 |
| id-UESliceMaximumBitRateList                               | က                     |
| id-M4ReportAmount                                          | ::= 33                |
| id-M5ReportAmount                                          | ::= 33                |
| id-M6ReportAmount                                          | ::= 33                |
| 1d-M/ReportAmount<br>id TraludabaamMascuramantsTradiaation | ProtocollE-ID ::= 339 |
| id_M6DelayThreshold                                        | 1                     |
| id-PaqingCause                                             |                       |
|                                                            | •                     |

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ProtocolIE-ID ::= 345
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProtocoliE-ID ::= 358
                                                                                                                                                                                                                                                                                                                              ProtocoliE-ID ::= 354
                                                                                                                                                                                                                                                                                                                                                                                   ProtocolIE-ID ::= 356
                                                                                                                                               ProtocolIE-ID ::= 348
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ProtocolIE-ID ::= 353
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ProtocolIE-ID ::= 343
                            ProtocolIE-ID ::= 344
                                                                                      ProtocolIE-ID ::= 346
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                                                                                                                                                                                                                                 ProtocolIE-ID ::= 351
                                                                                                                                                                                                                                                                                                                                                         ProtocolIE-ID ::= 355
                                                                                                                                                                                                                                                                                                                                                                                                                  ProtocolIE-ID ::= 357
                                                                                        id-FiveG-ProSeUEPC5AggregateMaximumBitRate
                                                                                                                                                                                                    id-MBSSessionModificationResponseTransfer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         id-ManagementBasedMDTPLMNModificationList
                                                                                                                                               id-MBSSessionModificationFailureTransfer
                                                                                                                                                                          id-MBSSessionModificationRequestTransfer
                                                                                                                                                                                                                                                                                                                                                                                     id-NGAPIESupportInformationResponseList
id-PagingCauseIndicationForVoiceService
                                                                                                                                                                                                                                                                                                                                                           id-NGAPIESupportInformationRequestList
                                                                                                                                                                                                                                                                                                                                                                                                                                                    id-MBSSessionReleaseResponseTransfer
                                                                                                                     id-FiveG-ProSePC50oSParameters
                            id-PEIPSassistanceInformation
                                                                                                                                                                                                                                        id-MBS-QoSFlowToReleaseList
                                                                                                                                                                                                                                                                id-MBS-SessionTNLInfo5GC
                                                       id-FiveG-ProSeAuthorized
                                                                                                                                                                                                                                                                                                                              id-SourceNodeTNLAddrInfo
                                                                                                                                                                                                                                                                                                                                                                                                                     id-MBS-SessionFSAIDList
                                                                                                                                                                                                                                                                                                 id-TAINSAGSupportList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -- ASN1STOP
```

# Container Definitions 9.4.8

END

```
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-Containers (5) }
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -- IE parameter types from other modules.
                                                                                                                                                                                                                                                                                                     DEFINITIONS AUTOMATIC TAGS ::=
                                                                                 -- Container definitions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ProtocolExtensionID,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ProtocolIE-ID
                                                                                                                                                                                           NGAP-Containers {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PrivateIE-ID,
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-- ASN1START
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                                                                                                                                                                                                                                                                                                                                                            BEGIN
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FROM NGAP-CommonDataTypes

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -- Class Definition for Protocol Extensions
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                                                                                               -- Class Definition for Protocol IEs
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                                                                                                                                                                                Criticality,
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&criticality
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           maxProtocolExtensions,
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                                          FROM NGAP-Constants;
                           maxProtocolIEs
maxPrivateIEs,
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                                                                                                                                                                               &criticality
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   &FirstValue,
                                                                                                                                                                                                                                                                  CRITICALITY
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                                                                                                                                                                                                                                       WITH SYNTAX {
                                                                                                                                                                                                                                                                                              PRESENCE
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                                                                                                                                                                                                 &Value,
                                                                                                                                                                                                                                                                                   TYPE
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({IEsSetParam}{@id}),
({IEsSetParam}{@id})
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ({IEsSetParam}),
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ProtocolIE-Field {{IEsSetParam}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ProtocolIE-Container {NGAP-PROTOCOL-IES : IESSetParam} ::=
                     UNIQUE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGAP-PROTOCOL-IES. &criticality NGAP-PROTOCOL-IES. &Value
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                ProtocolExtensionID
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NGAP-PROTOCOL-EXTENSION ::= CLASS {
                                                                                                                                                                                                                                                                                      -- Class Definition for Private IEs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -- Container for Protocol IE Pairs
                                                                                                                                                                                                                                                                                                                                                                 Criticality,
                                      Criticality,
                                                                                                                                                     &criticality
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                                                           &Extension,
                                                                                                            WITH SYNTAX {
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ProtocolIE-ContainerPairList {INTEGER : lowerBound, INTEGER : upperBound, NGAP-PROTOCOL-IES-PAIR : IEsSetParam} ::=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, NGAP-PROTOCOL-IES : IEsSetParam} ::=
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({ExtensionSetParam}{@id}),
({ExtensionSetParam}{@id}))
                                                                                                                                                                                                                                                                                        ({IEsSetParam}{@id}),
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                                                                                                                                                            ProtocolIE-FieldPair {NGAP-PROTOCOL-IES-PAIR : IESSetParam} ::= SEQUENCE {
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                                                                                                                                                                                                                                         NGAP-PROTOCOL-IES-PAIR.&firstCriticality
ProtocolIE-ContainerPair {NGAP-PROTOCOL-IES-PAIR : IESSetParam}
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                                                                                                                                                                                                                                                                                                                                                                     NGAP-PROTOCOL-IES-PAIR. & SecondValue
                                                                                                                                                                                                                                                                                        NGAP-PROTOCOL-IES-PAIR.&FirstValue
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NGAP-PROTOCOL-EXTENSION. &id
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -- Container Lists for Protocol IE Containers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ProtocolIE-ContainerPair {{IEsSetParam}}
                                    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
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                                                                         ProtocolIE-FieldPair {{IEsSetParam}}
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                                                                                                                                                                                                                                                                                        firstValue
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#### 9.5 Message Transfer Syntax

NGAP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax as specified in ITU-T Rec. X.691 [4].

#### 9.6 Timers

#### TNG<sub>RELOCprep</sub>

- Specifies the maximum time for the Handover Preparation procedure in the source NG-RAN node.

#### $TNG_{RELOCoverall} \\$

- Specifies the maximum time for the protection of the overall handover procedure in the source NG-RAN node.

#### $TXn_{RELOCOverall}$

- Specified in TS 38.423 [24].

#### Handling of Unknown, Unforeseen and Erroneous Protocol Data

#### 10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error.
- Abstract Syntax Error.
- Logical Error.

Protocol errors can occur in the following functions within a receiving node:

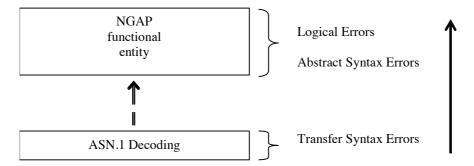


Figure 10.1-1: Protocol Errors in NGAP.

The information stated in subclauses 10.2, 10.3 and 10.4, to be included in the message used when reporting an error, is what at minimum shall be included. Other optional information elements within the message may also be included, if available. This is also valid for the case when the reporting is done with a response message. The latter is an exception to what is stated in subclause 4.1.

#### 10.2 Transfer Syntax Error

A Transfer Syntax Error occurs when the receiver is not able to decode the received physical message. Transfer syntax errors are always detected in the process of ASN.1 decoding. If a Transfer Syntax Error occurs, the receiver should initiate Error Indication procedure with appropriate cause value for the Transfer Syntax protocol error.

Examples for Transfer Syntax Errors are:

- Violation of value ranges in ASN.1 definition of messages. E.g., if an IE has a defined value range of 0 to 10 (ASN.1: INTEGER (0..10)), and 12 will be received, then this will be treated as a transfer syntax error.
- Violation in list element constraints. E.g., if a list is defined as containing 1 to 10 elements, and 12 elements will be received, then this case will be handled as a transfer syntax error.
- Missing mandatory elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).
- Wrong order of elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

#### 10.3 Abstract Syntax Error

#### 10.3.1 General

An Abstract Syntax Error occurs when the receiving functional NGAP entity:

1. receives IEs or IE groups that cannot be understood (unknown IE ID);

- 2. receives IEs for which the logical range is violated (e.g., ASN.1 definition: 0 to 15, the logical range is 0 to 10, while values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message);
- 3. does not receive IEs or IE groups but according to the specified presence of the concerning object, the IEs or IE groups should have been present in the received message.
- 4. receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;
- 5. receives IEs or IE groups but according to the conditional presence of the concerning object and the specified condition, the IEs or IE groups should not have been present in the received message.
- 6. receives IEs or IE groups for a functionality that is not supported.

Cases 1, 2 and 6 (not comprehended IE/IE group) are handled based on received Criticality information. Case 3 (missing IE/IE group) is handled based on Criticality information and Presence information for the missing IE/IE group specified in the version of the specification used by the receiver. Case 4 (IEs or IE groups in wrong order or with too many occurrences) and Case 5 (erroneously present conditional IEs or IE groups) result in rejecting the procedure.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error that belong to cases 1-3 and 6 act according to the Criticality Information and Presence Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclauses 10.3.4 and 10.3.5. The handling of cases 4 and 5 is specified in subclause 10.3.6.

#### 10.3.2 Criticality Information

In the NGAP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended, i.e., the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.4.

In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.
- Ignore IE and Notify Sender.
- Ignore IE.

The comprehension of different IEs or IE groups within a standard version or between standard versions is not mandated. Any IE or IE group that is not supported shall be considered not comprehended, even if another IE or IE group for that EP from that standard version is comprehended, and action based on criticality shall be applied.

The comprehension of different EPs within a standard version or between different standard versions is not mandated. Any EP that is not supported shall be considered not comprehended, even if another EP from that standard version is comprehended, and action based on criticality shall be applied.

#### 10.3.3 Presence Information

For many IEs/IE groups which are optional according to the ASN.1 transfer syntax, NGAP specifies separately if the presence of these IEs/IE groups is optional or mandatory with respect to RNS application by means of the presence field of the concerning object of class NGAP-PROTOCOL-IES, NGAP-PROTOCOL-IES-PAIR, NGAP-PROTOCOL-EXTENSION or NGAP-PRIVATE-IES.

The presence field of the indicated classes supports three values:

- 1. Optional;
- 2. Conditional;

#### 3. Mandatory.

If an IE/IE group is not included in a received message and the presence of the IE/IE group is mandatory or the presence is conditional and the condition is true according to the version of the specification used by the receiver, an abstract syntax error occurs due to a missing IE/IE group.

If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

#### 10.3.4 Not comprehended IE/IE group

#### 10.3.4.1 Procedure Code

The receiving node shall treat the different types of received criticality information of the *Procedure Code* IE according to the following:

#### **Reject IE:**

- If a message is received with a *Procedure Code* IE marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

#### **Ignore IE and Notify Sender:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

#### **Ignore IE:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the *Procedure Code* IE, the *Triggering Message* IE, and the *Procedure Criticality* IE in the *Criticality Diagnostics* IE.

#### 10.3.4.1A Type of Message

When the receiving node cannot decode the *Type of Message* IE, the Error Indication procedure shall be initiated with an appropriate cause value.

#### 10.3.4.2 IEs other than the Procedure Code and Type of Message

The receiving node shall treat the different types of received criticality information of an IE/IE group other than the *Procedure Code* IE and *Type of Message* IE according to the following:

#### Reject IE:

- If a message *initiating* a procedure is received containing one or more IEs/IE group marked with "*Reject IE*" which the receiving node does not comprehend; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the rejection of one or more IEs/IE group using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.
- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing one or more IEs/IE groups marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall terminate the procedure and initiate the Error Indication procedure.
- If a *response* message is received containing one or more IEs marked with "*Reject IE*", that the receiving node does not comprehend, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

#### **Ignore IE and Notify Sender:**

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups, and report in the response message of the procedure that one or more IEs/IE groups have been ignored. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.
- if a message *initiating* a procedure that does not have a message to report the outcome of the procedure is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups, and initiate the Error Indication procedure to report that one or more IEs/IE groups have been ignored.
- If a *response* message is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups and initiate the Error Indication procedure.

#### **Ignore IE:**

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using the understood IEs/IE groups.
- If a *response* message is received containing one or more IEs/IE groups marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using the understood IEs/IE groups.

When reporting not comprehended IEs/IE groups marked with "Reject IE" or "Ignore IE and Notify Sender" using a response message defined for the procedure, the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group.

When reporting not comprehended IEs/IE groups marked with "Reject IE" or "Ignore IE and Notify Sender" using the Error Indication procedure, the Procedure Code IE, the Triggering Message IE, Procedure Criticality IE, and the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group.

#### 10.3.5 Missing IE or IE group

The receiving node shall treat the missing IE/IE group according to the criticality information for the missing IE/IE group in the received message specified in the version of this specification used by the receiver:

#### Reject IE:

- if a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "Reject IE"; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the missing IEs/IE groups using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.
- if a received message *initiating* a procedure that does not have a message to report unsuccessful outcome is missing one or more IEs/IE groups with specified criticality "*Reject IE*", the receiving node shall terminate the procedure and initiate the Error Indication procedure.
- if a received *response* message is missing one or more IEs/IE groups with specified criticality "*Reject IE*, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

#### Ignore IE and Notify Sender:

- if a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "Ignore IE and Notify Sender", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and report in the response message of the procedure that one or more IEs/IE groups were missing. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.
- if a received message *initiating* a procedure that does not have a message to report the outcome of the procedure is missing one or more IEs/IE groups with specified criticality "*Ignore IE and Notify Sender*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.
- if a received *response* message is missing one or more IEs/IE groups with specified criticality "*Ignore IE and Notify Sender*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.

#### **Ignore IE:**

- if a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "*Ignore IE*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message.
- if a received *response* message is missing one or more IEs/IE groups with specified criticality "*Ignore IE*", the receiving node shall ignore that those IEs/IE groups are missing and continue with the procedure based on the other IEs/IE groups present in the message.

When reporting missing IEs/IE groups with specified criticality "Reject IE" or "Ignore IE and Notify Sender" using a response message defined for the procedure, the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group.

When reporting missing IEs/IE groups with specified criticality "Reject IE" or "Ignore IE and Notify Sender" using the Error Indication procedure, the Procedure Code IE, the Triggering Message IE, Procedure Criticality IE, and the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group.

### 10.3.6 IEs or IE groups received in wrong order or with too many occurrences or erroneously present

If a message with IEs or IE groups in wrong order or with too many occurrences is received or if IEs or IE groups with a conditional presence are present when the condition is not met (i.e., erroneously present), the receiving node shall behave according to the following:

- If a message *initiating* a procedure is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the cause value "Abstract Syntax Error (Falsely Constructed Message)" using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.
- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall terminate the procedure and initiate the Error Indication procedure, and use cause value "Abstract Syntax Error (Falsely Constructed Message)".
- If a *response* message is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

When determining the correct order only the IEs specified in the specification version used by the receiver shall be considered.

#### 10.4 Logical Error

Logical error situations occur when a message is comprehended correctly, but the information contained within the message is not valid (i.e., semantic error), or describes a procedure which is not compatible with the state of the receiver. In these conditions, the following behaviour shall be performed (unless otherwise specified) as defined by the class of the elementary procedure, irrespective of the criticality information of the IEs/IE groups containing the erroneous values.

#### Class 1:

Where the logical error occurs in a request message of a class 1 procedure, and the procedure has a message to report this unsuccessful outcome, this message shall be sent with an appropriate cause value. Typical cause values are:

- Semantic Error.
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 1 procedure, and the procedure does not have a message to report this unsuccessful outcome, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

Where the logical error exists in a response message of a class 1 procedure, the procedure shall be considered as unsuccessfully terminated and local error handling shall be initiated.

#### Class 2:

Where the logical error occurs in a message of a class 2 procedure, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

#### 10.5 Exceptions

The error handling for all the cases described hereafter shall take precedence over any other error handling described in the other subclauses of clause 10.

- If any type of error (Transfer Syntax Error, Abstract Syntax Error or Logical Error) is detected in the ERROR INDICATION message, it shall not trigger the Error Indication procedure in the receiving Node but local error handling.
- In case a response message or Error Indication message needs to be returned, but the information necessary to
  determine the receiver of that message is missing, the procedure shall be considered as unsuccessfully terminated
  and local error handling shall be initiated.
- If an error that terminates a procedure occurs, the returned cause value shall reflect the error that caused the termination of the procedure even if one or more abstract syntax errors with criticality "ignore and notify" have earlier occurred within the same procedure.
- If an AP ID error is detected, the error handling as described in subclause 10.6 shall be applied.

#### 10.6 Handling of AP ID

NOTE:

The "first message", the "first returned message" and the "last message" as used below correspond to messages for a UE-associated logical connection. The "first message" has a new AP ID from the sending node and the "first returned message" is the first response message, which has a new AP ID from the node sending the "first returned message". Thereafter the two AP IDs are included in all messages over the UE-associated logical connection unless otherwise allowed by the specification. The "last message" is a message sent by a node in order to complete the termination of a given UE-associated logical connection, such that no other messages for the same connection are expected in either direction. The nodes should ensure as far as possible that previously allocated AP ID are not immediately reused.

If a node receives a first returned message that includes an unknown local AP ID, the receiving node shall initiate an Error Indication procedure with inclusion of the received AP IDs from the peer node and an appropriate cause value. Both nodes shall initiate a local release of any established UE-associated logical connection (for the same NG interface) having these AP IDs as local or remote identifier.

If a node receives a message (other than the first or first returned messages) including an erroneous AP ID that is either an unknown local AP ID, or an inconsistent remote AP ID (i.e. it is different to the remote AP ID stored previously for this UE-associated logical connection) for the same NG interface:

- if this message is not the last message for this UE-associated logical connection, the node shall initiate an Error Indication procedure with inclusion of the received AP ID(s) from the peer node and an appropriate cause value. Both nodes shall initiate a local release of any established UE-associated logical connection (for the same NG interface) having the erroneous AP ID as either the local or remote identifier.
- if this message is the last message for this UE-associated logical connection, the receiving node shall initiate a local release of any established UE-associated logical connection (for the same NG interface) having the erroneous AP ID as either the local or remote identifier.

## Annex A (informative): Change history

|                    |                  |                        |      |                                                  |     | Change history                                                                                        |                  |
|--------------------|------------------|------------------------|------|--------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|------------------|
| Date               | Meeting          | Tdoc                   | CR   | Rev                                              | Cat | Subject/Comment                                                                                       | New <sub>.</sub> |
| 0017.01            | Do //orl-        | D0 474000              |      |                                                  |     | TO dedute:                                                                                            | version          |
| 2017-04            | R3#95b           | R3-171209              | -    | -                                                | -   | TS skeleton                                                                                           | 0.0.0            |
| 2017-04            | R3#95b           | R3-171311              | -    | -                                                | -   | Incorporated agreed TPs from R3#95b                                                                   | 0.0.1            |
| 2017-05            | R3#96            | R3-171480<br>R3-171975 | -    | -                                                | -   | Update of title page and change history                                                               | 0.0.2            |
| 2017-05            | R3#96            |                        | -    | -                                                | -   | Incorporated agreed TPs from R3#96                                                                    | 0.1.0            |
| 2017-07            | R3 NR#2          | R3-172604              | -    | <del>  -</del>                                   | -   | Incorporated agreed TPs from R3 NR#2 Adhoc                                                            | 0.2.0            |
| 2017-08            | R3#97            | R3-173447              | -    | -                                                | -   | Incorporated agreed TPs from R3#97                                                                    | 0.3.0            |
| 2017-10            | R3#97b           | R3-174239              | -    | -                                                | -   | Incorporated agreed TPs from R3#97b                                                                   | 0.4.0            |
| 2017-12            | R3#98            | R3-175056              | -    | -                                                | -   | Incorporated agreed TPs from R3#98                                                                    | 0.5.0            |
| 2018-01            | R3 NR#1          | R3-180651              | -    | -                                                | -   | Incorporated agreed TPs from R3 NR Adhoc 1801                                                         | 0.6.0            |
| 2018-03            | R3#99            | R3-181588              | -    | -                                                | -   | Incorporated agreed TPs from R3#99                                                                    | 0.7.0            |
| 2018-04<br>2018-05 | R3#99b<br>R3#100 | R3-182524              | -    | -                                                | -   | Incorporated agreed TPs from R3#99b                                                                   | 0.8.0            |
| 2018-05            |                  | R3-183592              | -    | <u> </u>                                         | -   | Incorporated agreed TPs from R3#100                                                                   |                  |
| 2018-06            | RAN#80<br>RAN#80 | RP-180737              | -    | <u> </u>                                         | -   | For approval Specification approved at TSG-RAN and placed under change                                | 1.0.0<br>15.0.0  |
|                    |                  | -                      | -    | _                                                |     | control                                                                                               |                  |
| 2018-09            | RAN#81           | RP-181922              | 0001 | 2                                                | F   | NR Corrections (38.413 Baseline CR covering RAN3-101 agreements)                                      | 15.1.0           |
| 2018-12            | RAN#82           | RP-182448              | 0003 | 2                                                | F   | Baseline CR for TS 38.413                                                                             | 15.2.0           |
| 2019-03            | RAN#83           | RP-190556              | 0005 | 3                                                | F   | NGAP Corrections for UP Security Handling in DC during PDU Session Lifetime                           | 15.3.0           |
| 2019-03            | RAN#83           | RP-190555              | 0008 | 2                                                | F   | Separate UL/DL limits for UE's maximum IP rate                                                        | 15.3.0           |
| 2019-03            | RAN#83           | RP-190554              | 0009 | 1                                                | F   | Data volume reporting for MR-DC with 5GC                                                              | 15.3.0           |
| 2019-03            | RAN#83           | RP-190554              | 0010 | 3                                                | F   | Correction of PDU Session split at handover                                                           | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0011 | 1                                                | F   | Correction of EPS Voice Fallback                                                                      | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0012 | <del>-</del>                                     | F   | Correction of slice support over NG                                                                   | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0014 | 1                                                | F   | Rapporteur updates for TS 38.413                                                                      | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0015 | -                                                | F   | Correction of User Location Information IE presence in HANDOVER                                       | 15.3.0           |
|                    |                  |                        |      |                                                  |     | NOTIFY                                                                                                |                  |
| 2019-03            | RAN#83           | RP-190556              | 0019 | 1                                                | F   | Correction to RRC state report                                                                        | 15.3.0           |
| 2019-03            | RAN#83           | RP-190555              | 0021 | -                                                | F   | Support of RAN initiated multiple SCTP associations                                                   | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0023 | -                                                | F   | Corrections on RAN/AMF Configuration Update                                                           | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0024 | 2                                                | F   | Correction of EPC interworking                                                                        | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0025 | 1                                                | F   | Correction of Emergency Fallback                                                                      | 15.3.0           |
| 2019-03            | RAN#83           | RP-190202              | 0027 | 3                                                | F   | Transfer of the PSCell information to Core Network                                                    | 15.3.0           |
| 2019-03            | RAN#83           | RP-190558              | 0028 | 1                                                | F   | Release due to pre-emption                                                                            | 15.3.0           |
| 2019-03            | RAN#83           | RP-190558              | 0029 | -                                                | F   | Handling of APID for the first returned message                                                       | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0037 | -                                                | F   | Clarification on the usage of TNL information                                                         | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0044 | 1                                                | F   | NG Setup Correction and UE context retention                                                          | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0045 | 1                                                | F   | UE AMBR handling in PDU Session Resouce Setup procedure                                               | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0046 | 1                                                | F   | Remove the second tunnel in the PDU session split, 5GC initiated                                      | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0048 | 1                                                | F   | When NG-RAN node fails to set up a QoS flow for IMS voice                                             | 15.3.0           |
| 2019-03            |                  | RP-190556              | 0052 | -                                                | F   | Correction of ASN.1 for PDU Session Resource Modify Response                                          | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0053 | 1                                                | F   | Cause value in RRC fallback case                                                                      | 15.3.0           |
| 2019-03            | RAN#83           | RP-190556              | 0058 | 2                                                | F   | S-NSSAI update during EPS to 5GS handover                                                             | 15.3.0           |
| 2019-03            | RAN#83           | RP-190561              | 0064 | 1                                                | F   | Introduction of TNL Address discovery for EN-DC (using new container)                                 | 15.3.0           |
| 2019-03            | RAN#83           | RP-190200              | 0066 | -                                                | F   | Correction of ASN.1 for SON Configuration Transfer and PDU                                            | 15.3.0           |
| 2019-07            | RAN#84           | RP-191394              | 0099 | 1                                                | F   | Session Resource Modify Request Transfer Rapporteur updates for TS 38.413                             | 15.4.0           |
| 2019-07            | RAN#84<br>RP-84  | RP-191394<br>RP-191397 | 0099 | 2                                                | F   | Support of ongoing re-mapping on source side during SDAP mobility                                     | 15.4.0           |
| 2019-07            | RP-84            | RP-191397              | 0041 | 1                                                | F   | NGAP Further Clarification of S-NSSAI Update for EPS to 5GS HO                                        | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0007 | <del>                                     </del> | F   | CR38413 for Clarification on PDU Session resource modify                                              | 15.4.0           |
| 2019-07            | RP-84            | RP-191397              | 0071 | 1                                                | F   | Correction of Core Network Type Restrictions                                                          | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0073 | 1                                                | F   | Correction of PDU Session Release                                                                     | 15.4.0           |
| 2019-07            | RP-84            | RP-191395              | 0077 | 2                                                | F   | Removal of multiple SCTP associations                                                                 | 15.4.0           |
| _010 01            | 1 54             | 1.1. 101000            | 3304 |                                                  | , i | PS: This CR was not implemented as it was not based on the latest version of the spec.                | 13.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0095 |                                                  | F   | Correction on Error Indication procedure                                                              | 15.4.0           |
| 2019-07            | RP-84            | RP-191394<br>RP-191394 | 0095 |                                                  | F   | Location Report Request Type                                                                          | 15.4.0           |
| 2019-07            | RP-84<br>RP-84   | RP-191394<br>RP-191394 | 0101 | 2                                                | F   | GUAMI update in case of AMF change                                                                    | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0101 | 2                                                | F   | Data forwarding and QoS flow remapping                                                                | 15.4.0           |
| 2019-07            | RP-84            | RP-191397              | 0102 | 1                                                | F   | Correction of CN Assistance Information                                                               | 15.4.0           |
| 2019-07            | RP-84            | RP-191397              | 0112 | <del>                                     </del> | F   | Correction of Network Instance                                                                        | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0117 | 1                                                | F   | Correction of AMF UE NGAP ID                                                                          | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0130 | 1                                                | F   | Adding PSCell to the User Location Information                                                        | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0135 | <del>- '</del>                                   | F   | Correction on Handover Command message                                                                | 15.4.0           |
| 2019-07            | RP-84            | RP-191394              | 0148 |                                                  | F   | Correction of Handover Command message  Correction of duplicated descriptions on additional UL tunnel | 15.4.0           |
|                    | 111-04           | 111 131034             | 0140 | 1                                                | '   |                                                                                                       | 13.4.0           |
| 2019-07            |                  |                        |      |                                                  |     | information                                                                                           |                  |

| 0010.00                                                                                                                                                                                                                                                                                                          | DD or                                                                                                                                                                                                                                                                                                                                                                                                                                   | DD 100100                                                                                                                                                                                                                                                                                                                                                                                                                           | 0101                                                                                                                                                                                                                                 |                                                                                                                                                                                            |                                       | Correction of accuracy signalling as a settler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.5.0                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2019-09                                                                                                                                                                                                                                                                                                          | RP-85<br>RP-85                                                                                                                                                                                                                                                                                                                                                                                                                          | RP-192166<br>RP-192167                                                                                                                                                                                                                                                                                                                                                                                                              | 0161<br>0178                                                                                                                                                                                                                         | 1                                                                                                                                                                                          | F                                     | Correction of secured signalling connection  PDU Session fail in Path Switch Request procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.5.0<br>15.5.0                                                                                                                                                                                                                                                                                                                                                     |
| 2019-09                                                                                                                                                                                                                                                                                                          | RP-85                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192167                                                                                                                                                                                                                                                                                                                                                                                                                           | 0176                                                                                                                                                                                                                                 | 2                                                                                                                                                                                          | F                                     | Reroute NSSF provided information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15.5.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-09                                                                                                                                                                                                                                                                                                          | RP-85                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192166                                                                                                                                                                                                                                                                                                                                                                                                                           | 0199                                                                                                                                                                                                                                 |                                                                                                                                                                                            | F                                     | Correction of Handover Command message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.5.0                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                  | 55                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1 102100                                                                                                                                                                                                                                                                                                                                                                                                                            | 3100                                                                                                                                                                                                                                 |                                                                                                                                                                                            | '                                     | 555561 Or Harlas vol. Sommand Mossage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | .5.5.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-09                                                                                                                                                                                                                                                                                                          | RP-85                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192167                                                                                                                                                                                                                                                                                                                                                                                                                           | 0220                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | NGAP correction of Initial Context Setup procedure text                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.5.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-09                                                                                                                                                                                                                                                                                                          | RP-85                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192167                                                                                                                                                                                                                                                                                                                                                                                                                           | 0226                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | Rapporteur cleanup of IE semantics descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15.5.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192915                                                                                                                                                                                                                                                                                                                                                                                                                           | 0256                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | Correction of NAS transparent container                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192915                                                                                                                                                                                                                                                                                                                                                                                                                           | 0258                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | Missing procedural texts for NG interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192915                                                                                                                                                                                                                                                                                                                                                                                                                           | 0261                                                                                                                                                                                                                                 |                                                                                                                                                                                            | F                                     | Correction of Handover Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192915                                                                                                                                                                                                                                                                                                                                                                                                                           | 0262                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | Correction of S-NSSAI coding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192916                                                                                                                                                                                                                                                                                                                                                                                                                           | 0269                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | FL                                    | Correction of Port Number IE in tabular                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192915                                                                                                                                                                                                                                                                                                                                                                                                                           | 0276                                                                                                                                                                                                                                 | 2                                                                                                                                                                                          | F                                     | Enable inclusion of the Backup AMF Name IE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86<br>RP-86                                                                                                                                                                                                                                                                                                                                                                                                                          | RP-192916<br>RP-192896                                                                                                                                                                                                                                                                                                                                                                                                              | 0281<br>0286                                                                                                                                                                                                                         | 2                                                                                                                                                                                          | F                                     | Correction of NG Handover                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15.6.0<br>15.6.0                                                                                                                                                                                                                                                                                                                                                     |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192896<br>RP-192916                                                                                                                                                                                                                                                                                                                                                                                                              | 0300                                                                                                                                                                                                                                 | 3                                                                                                                                                                                          | F                                     | Addition of abnormal cases for location report procedure CR to 38.413 on clarifications to Xn TNL Configuration Info                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192916<br>RP-192916                                                                                                                                                                                                                                                                                                                                                                                                              | 0300                                                                                                                                                                                                                                 |                                                                                                                                                                                            | F                                     | CR for Clarification on purpose of path switch request                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-193055                                                                                                                                                                                                                                                                                                                                                                                                                           | 0304                                                                                                                                                                                                                                 |                                                                                                                                                                                            | F                                     | Correction of Xn TNL Configuration Info                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.6.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192912                                                                                                                                                                                                                                                                                                                                                                                                                           | 0051                                                                                                                                                                                                                                 | 7                                                                                                                                                                                          | В                                     | Support of Direct Data forwarding for handover between 4G and 5G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16.0.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192908                                                                                                                                                                                                                                                                                                                                                                                                                           | 0137                                                                                                                                                                                                                                 | 6                                                                                                                                                                                          | В                                     | CR to 38.413 for signalling design for RIM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 16.0.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192916                                                                                                                                                                                                                                                                                                                                                                                                                           | 0143                                                                                                                                                                                                                                 | 3                                                                                                                                                                                          | В                                     | The GUAMI and GUMMEI usage for EPS/5GS interworking                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.0.0                                                                                                                                                                                                                                                                                                                                                               |
| 2019-12                                                                                                                                                                                                                                                                                                          | RP-86                                                                                                                                                                                                                                                                                                                                                                                                                                   | RP-192913                                                                                                                                                                                                                                                                                                                                                                                                                           | 0266                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | С                                     | Extending the MDBV Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 16.0.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200424                                                                                                                                                                                                                                                                                                                                                                                                                           | 0234                                                                                                                                                                                                                                 | 6                                                                                                                                                                                          | В                                     | Support of SRVCC from 5G to 3G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200422                                                                                                                                                                                                                                                                                                                                                                                                                           | 0291                                                                                                                                                                                                                                 | 2                                                                                                                                                                                          | В                                     | Introduction of NR-U                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200425                                                                                                                                                                                                                                                                                                                                                                                                                           | 0314                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | F                                     | Addition of the PSCell information in the path update procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200428                                                                                                                                                                                                                                                                                                                                                                                                                           | 0317                                                                                                                                                                                                                                 |                                                                                                                                                                                            | Α                                     | Correction of Warning Security Information in ETWS primary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020.02                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200429                                                                                                                                                                                                                                                                                                                                                                                                                           | 0319                                                                                                                                                                                                                                 | $\vdash \vdash \vdash$                                                                                                                                                                     | ^                                     | notification  Correction of tabular for Xn TNL Configuration Info                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16 1 0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200429<br>RP-200425                                                                                                                                                                                                                                                                                                                                                                                                              | 0319                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | A<br>F                                | NGAP Rapporteur corrections                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 16.1.0<br>16.1.0                                                                                                                                                                                                                                                                                                                                                     |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200425                                                                                                                                                                                                                                                                                                                                                                                                                           | 0320                                                                                                                                                                                                                                 | 4                                                                                                                                                                                          | В                                     | E2E delay measurement for QoS monitoring for URLLC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200419                                                                                                                                                                                                                                                                                                                                                                                                                           | 0331                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | В                                     | Inter-system direct forwarding with shared SgNB/gNB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200428                                                                                                                                                                                                                                                                                                                                                                                                                           | 0335                                                                                                                                                                                                                                 | $\vdash$                                                                                                                                                                                   | A                                     | Correction of RAN paging priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200428                                                                                                                                                                                                                                                                                                                                                                                                                           | 0337                                                                                                                                                                                                                                 | 1                                                                                                                                                                                          | A                                     | PDU session resource in UE context release                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-03                                                                                                                                                                                                                                                                                                          | RP-87-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-200423                                                                                                                                                                                                                                                                                                                                                                                                                           | 0347                                                                                                                                                                                                                                 | 2                                                                                                                                                                                          | В                                     | Introducing Radio Capability Optimisation (RACS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16.1.0                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                      |                                                                                                                                                                                            | 1                                     | (The CR is not implemented. The CR was marked agreed by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I                                                                                                                                                                                                                                                                                                                                                                    |
| į .                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                      |                                                                                                                                                                                            |                                       | mietaka while the Williamst wat a marketa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
| 0000                                                                                                                                                                                                                                                                                                             | DE 07                                                                                                                                                                                                                                                                                                                                                                                                                                   | DD 22:                                                                                                                                                                                                                                                                                                                                                                                                                              | 000-                                                                                                                                                                                                                                 | <u> </u>                                                                                                                                                                                   |                                       | mistake while the WI is not yet complete)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 100-                                                                                                                                                                                                                                                                                                                                                                 |
| 2020-07                                                                                                                                                                                                                                                                                                          | RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-201077                                                                                                                                                                                                                                                                                                                                                                                                                           | 0063                                                                                                                                                                                                                                 | 13                                                                                                                                                                                         | В                                     | BL CR to 38.413: Support for IAB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16.2.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-07                                                                                                                                                                                                                                                                                                          | RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                                                 | RP-201079                                                                                                                                                                                                                                                                                                                                                                                                                           | 0082                                                                                                                                                                                                                                 | 15                                                                                                                                                                                         | В                                     | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16.2.0                                                                                                                                                                                                                                                                                                                                                               |
| 2020-07<br>2020-07                                                                                                                                                                                                                                                                                               | RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                                      | RP-201079<br>RP-201088                                                                                                                                                                                                                                                                                                                                                                                                              | 0082<br>0120                                                                                                                                                                                                                         | 15<br>10                                                                                                                                                                                   | B<br>B                                | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                                                                     |
| 2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                                                                                    | RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                           | RP-201079<br>RP-201088<br>RP-201086                                                                                                                                                                                                                                                                                                                                                                                                 | 0082<br>0120<br>0153                                                                                                                                                                                                                 | 15<br>10<br>11                                                                                                                                                                             | B<br>B                                | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                                                           |
| 2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                                                                         | RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                           | RP-201079<br>RP-201088<br>RP-201086<br>RP-201335                                                                                                                                                                                                                                                                                                                                                                                    | 0082<br>0120<br>0153<br>0156                                                                                                                                                                                                         | 15<br>10<br>11<br>11                                                                                                                                                                       | B<br>B<br>B                           | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                                                 |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                                                              | RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                           | RP-201079<br>RP-201088<br>RP-201086<br>RP-201335<br>RP-201088                                                                                                                                                                                                                                                                                                                                                                       | 0082<br>0120<br>0153<br>0156<br>0157                                                                                                                                                                                                 | 15<br>10<br>11                                                                                                                                                                             | B<br>B<br>B<br>B                      | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                                                           |
| 2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                                                                         | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                                                | RP-201079<br>RP-201088<br>RP-201086<br>RP-201335                                                                                                                                                                                                                                                                                                                                                                                    | 0082<br>0120<br>0153<br>0156                                                                                                                                                                                                         | 15<br>10<br>11<br>11<br>9                                                                                                                                                                  | B<br>B<br>B                           | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                                       |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                                                   | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                                          | RP-201079<br>RP-201088<br>RP-201086<br>RP-201335<br>RP-201088<br>RP-201074<br>RP-201087                                                                                                                                                                                                                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168                                                                                                                                                                                         | 15<br>10<br>11<br>11<br>9<br>10                                                                                                                                                            | B<br>B<br>B<br>B<br>B                 | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                             | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                               | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086                                                                                                                                                                                                                                                                                                                                                     | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173                                                                                                                                                                         | 15<br>10<br>11<br>11<br>9<br>10                                                                                                                                                            | B<br>B<br>B<br>B<br>B                 | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                         |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                             | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                                               | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086                                                                                                                                                                                                                                                                                                                                                     | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173                                                                                                                                                                         | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8                                                                                                                                           | B B B B B B B                         | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                                         |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                                  | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086 RP-201086 RP-201081                                                                                                                                                                                                                                                                                                                                 | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192                                                                                                                                                         | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8                                                                                                                                           | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                                               |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                                       | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                              | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082                                                                                                                                                                                                                                                                                                                       | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237                                                                                                                                                 | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11                                                                                                                         | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                           |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                            | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                                   | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082                                                                                                                                                                                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280                                                                                                                                         | 15<br>10<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                                    | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                 |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                                 | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                                        | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201080                                                                                                                                                                                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290                                                                                                                                 | 15<br>10<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                                    | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                                 |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                      | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                             | RP-201079 RP-201088 RP-201086 RP-201335 RP-201087 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201080 RP-201079                                                                                                                                                                                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290                                                                                                                                 | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                              | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                       |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                           | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                  | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201080 RP-201079 RP-201078                                                                                                                                                                                                                                                                                         | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313                                                                                                                         | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                              | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                                      | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                             | RP-201079 RP-201088 RP-201086 RP-201335 RP-201087 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201080 RP-201079                                                                                                                                                                                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290                                                                                                                                 | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                              | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                                       |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                  | RP-201079 RP-201088 RP-201086 RP-201335 RP-201087 RP-201086 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201078 RP-201078                                                                                                                                                                                                                                                                     | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347                                                                                                                 | 15<br>10<br>11<br>11<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7<br>9<br>4<br>6                                                                                                          | B B B B B B B A                       | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                                           | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                  | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201080 RP-201079 RP-201078                                                                                                                                                                                                                                                                                         | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313                                                                                                                         | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7                                                                                                              | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                     | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                                  | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201078 RP-201075                                                                                                                                                                                                                                                                     | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357                                                                                                         | 15<br>10<br>11<br>11<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7<br>9<br>4<br>6                                                                                                          | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                   |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                                                                                     | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                                       | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201079 RP-201075 RP-201083 RP-201085 RP-201091                                                                                                                                                                                                                                                 | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357                                                                                                         | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>2                                                                                                          | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                              | RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e<br>RP-88-e                                                                                                                                                                                                                                                            | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201074 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201082 RP-201079 RP-201079 RP-201075 RP-201083 RP-201085                                                                                                                                                                                                                                                 | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357                                                                                                         | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>8<br>10<br>11<br>11<br>10<br>7<br>9<br>4<br>6<br>2                                                                                          | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                                                         |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                                                   | RP-88-e                                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201075 RP-201083 RP-201085 RP-201091 RP-201091                                                                                                                                                                                                                                                 | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372                                                                 | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>6<br>2                                                                                                     | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction on AS rekeying handling                                                                                                                                                                                                                                                                                                                                                                                                     | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                                 |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                  | RP-88-e                                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201080 RP-201079 RP-201075 RP-201083 RP-201085 RP-201091 RP-201091 RP-201091 RP-201090                                                                                                                                                                                                         | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372<br>0389                                                         | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>6<br>2                                                                                                     | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction to PDU SESSION RESOURCE MODIFY CONFIRM                                                                                                                                                                                                                                                                                                                                                                                      | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                                       |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07                                             | RP-88-e                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201089 RP-201075 RP-201091 RP-201091 RP-201091 RP-201091 RP-201091 RP-201090 RP-201090                                                                                                                                                                                                         | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372<br>0389<br>0392                                                 | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>6<br>2<br>5<br>1<br>1<br>3<br>1<br>1                                                                       | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction to PDU SESSION RESOURCE MODIFY CONFIRM Selected PLMN ID for untrusted non-3GPP access                                                                                                                                                                                                                                                                                                                                       | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                                             |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07 | RP-88-e                                                                                                                                                                                                                 | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201075 RP-201075 RP-201083 RP-201085 RP-201091 RP-201091 RP-201091 RP-201090 RP-201090                                                                                                                                                                                               | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372<br>0379<br>0389<br>0395                                         | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>6<br>2<br>5<br>1<br>1<br>3<br>1<br>1<br>2                                                                  | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction on AS rekeying handling Correction to PDU SESSION RESOURCE MODIFY CONFIRM Selected PLMN ID for untrusted non-3GPP access Correstion on PDU Session Resrouce Modification Procedures                                                                                                                                                                                                                                         | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                                         |
| 2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07<br>2020-07            | RP-88-e                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201075 RP-201075 RP-201083 RP-201085 RP-201091 RP-201091 RP-201090 RP-201090 RP-201090                                                                                                                                                                                               | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372<br>0379<br>0389<br>0395<br>0401                                 | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>2<br>5<br>1<br>1<br>3<br>1<br>1<br>2<br>1                                                                        | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CloT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CloT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction to PDU SESSION RESOURCE MODIFY CONFIRM Selected PLMN ID for untrusted non-3GPP access Correstion on PDU Session Resrouce Modification Procedures QoS monitoring for URLLC                                                                                                                                                                                                                                                   | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                                     |
| 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07                                                                  | RP-88-e                                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201079 RP-201075 RP-201075 RP-201083 RP-201085 RP-201091 RP-201091 RP-201090 RP-201090 RP-201090 RP-201090                                                                                                                                                                 | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0357<br>0362<br>0364<br>0365<br>0371<br>0372<br>0379<br>0389<br>0392<br>0401<br>0408                         | 15<br>10<br>11<br>11<br>10<br>10<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>2<br>5<br>1<br>1<br>3<br>1<br>1<br>4                                                                       | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB Introduction of NR_IIOT support to TS 38.413 Introduction of NB-IoT Paging and eDRX aspects Common CP/UP aspects of CIoT UEs when connected to 5GC Introduction of NB-IoT related NG-AP procedures Introduction of CP UP NB-IoT Others Support of NR V2X over NG Introduction of eMTC connected to 5GC Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC Introduction of Suspend-Resume CR for introducing WWC in RAN Addition of SON features Addition of MDT feature Introduction of Non-Public Networks Support of Ethernet Header Compression Introducing Radio Capability Optimisation (RACS) Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message Baseline CR for introducing Rel-16 NR mobility enhancement ASN.1 Correction of the Data Forwarding Response E-RAB List IE NGAP Rapporteur corrections Correction of Revoke E-RAB ID Voice fallback triggered by PDU session resource setup Correction to PDU SESSION RESOURCE MODIFY CONFIRM Selected PLMN ID for untrusted non-3GPP access Correstion on PDU Session Resrouce Modification Procedures QoS monitoring for URLLC Correction of S-NSSAI range                                                                                                                                                                                                                       | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                                                           |
| 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07 2020-07                                          | RP-88-e                                                                                                                                                                                         | RP-201079 RP-201088 RP-201086 RP-201335 RP-201088 RP-201087 RP-201086 RP-201086 RP-201086 RP-201086 RP-201081 RP-201082 RP-201082 RP-201080 RP-201079 RP-201078 RP-201075 RP-201075 RP-201083 RP-201085 RP-201091 RP-201090 RP-201090 RP-201090 RP-201090 RP-201090 RP-201090 RP-201090                                                                                                                                             | 0082<br>0120<br>0153<br>0156<br>0157<br>0168<br>0172<br>0173<br>0188<br>0192<br>0237<br>0280<br>0290<br>0313<br>0347<br>0365<br>0364<br>0365<br>0371<br>0372<br>0379<br>0389<br>0395<br>0401<br>0408                                 | 15<br>10<br>11<br>11<br>11<br>9<br>10<br>10<br>11<br>10<br>7<br>9<br>4<br>6<br>2<br>5<br>1<br>1<br>3<br>1<br>1<br>1<br>2<br>4<br>4<br>3                                                    | B B B B B B B B B B B B B B B B B B B | BL CR to 38.413: Support for IAB  Introduction of NR_IIOT support to TS 38.413  Introduction of NB-IoT Paging and eDRX aspects  Common CP/UP aspects of CIoT UEs when connected to 5GC  Introduction of NB-IoT related NG-AP procedures  Introduction of CP UP NB-IoT Others  Support of NR V2X over NG  Introduction of eMTC connected to 5GC  Introduction of Control Plane CIoT 5GS Optimisation for NB-IOT and eMTC  Introduction of Suspend-Resume  CR for introducing WWC in RAN  Addition of SON features  Addition of MDT feature  Introduction of Non-Public Networks  Support of Ethernet Header Compression  Introducing Radio Capability Optimisation (RACS)  Clarification the usage of the New AMF UE NGAP ID included in the UE CONTEXT MODIFICATION REQUEST message  Baseline CR for introducing Rel-16 NR mobility enhancement  ASN.1 Correction of the Data Forwarding Response E-RAB List IE  NGAP Rapporteur corrections  Correction of Revoke E-RAB ID  Voice fallback triggered by PDU session resource setup  Correction to PDU SESSION RESOURCE MODIFY CONFIRM  Selected PLMN ID for untrusted non-3GPP access  Correstion on PDU Session Resrouce Modification Procedures  QoS monitoring for URLLC  Correction of S-NSSAI range  Support of PSCell/SCell-only operation mode                                                                                                                                                | 16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0<br>16.2.0                                                   |
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| 0000 00            | DD 00 -            | DD 004055              | 0440         | 4 | Λ.       | Fallows area of visual continuous and                                                                            | 1000             |
|--------------------|--------------------|------------------------|--------------|---|----------|------------------------------------------------------------------------------------------------------------------|------------------|
| 2020-09<br>2020-09 | RP-89-e<br>RP-89-e | RP-201955<br>RP-201955 | 0443<br>0445 | 1 | A<br>A   | Failure case of user location report  Multiple location reporting requests and report                            | 16.3.0<br>16.3.0 |
| 2020-09            | RP-89-e            | RP-201955              | 0462         |   | F        | Correction of asn.1 in NGAP Elementary Procedure List                                                            | 16.3.0           |
| 2020-09            | RP-89-e            | RP-201955              | 0463         | 1 | F        | Corrections to 38.413 on node name type                                                                          | 16.3.0           |
| 2020-12            | RP-90-e            | RP-202314              | 0410         | 1 | F        | Correction on Coverage Enhancement Restrictions                                                                  | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202314              | 0411         | 2 | F        | Correction on immediate suspension                                                                               | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202310              | 0414         | 1 | F        | Add the support for updating RG Level Wireline Access                                                            | 16.4.0           |
|                    |                    |                        |              |   |          | Characteristics and Global Cable ID                                                                              |                  |
| 2020-12            | RP-90-e            | RP-202314              | 0483         | 2 | F        | Correction of usage of the Extended Connected Time                                                               | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202312              | 0484         | 1 | F        | Support of release on CAG subscription change                                                                    | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202313              | 0485         | - | F        | Removal of duplicate import                                                                                      | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202311              | 0486         | 1 | F        | Correction of Redundant Tunnel Setup                                                                             | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202314              | 0499         | 1 | F        | CR38413 for clarification on UE-associated signalling for NBIOT                                                  | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202315              | 0501         | 1 | F        | procedures in Rel-16 CR38413 for clarification on UE-associated signalling in Rel-16                             | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202315              | 0505         | 1 | A        | Clarification on an abnormal condition in PDU Session Resource                                                   | 16.4.0           |
| 2020-12            | 111 -30-6          | 111 -202313            | 0303         | ' | ^        | Modify Procedure                                                                                                 | 10.4.0           |
| 2020-12            | RP-90-e            | RP-202313              | 0507         | 1 | F        | Introduction of reporting frequency for Qos monitoring for URLLC                                                 | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202310              | 0511         | 1 | F        | Introducing AQP in path switch request acknowledge message                                                       | 16.4.0           |
| 2020-12            | RP-90-e            | RP-202312              | 0512         | 1 | F        | Introducing UE radio capability ID in Connection Establishment                                                   | 16.4.0           |
|                    |                    |                        |              |   |          | Indication                                                                                                       |                  |
| 2020-12            | RP-90-e            | RP-202314              | 0514         |   | F        | Correction of RAN CP Relocation                                                                                  | 16.4.0           |
| 2021-03            | RP-91-e            | RP-210239              | 0355         | 5 | Α        | Clarification of AS re-keying in the UE Context Modification                                                     | 16.5.0           |
|                    |                    |                        |              |   |          | procedure                                                                                                        |                  |
| 2021-03            | RP-91-e            | RP-210235              | 0508         | 4 | F        | Introducing QoS parameters update at Xn handover                                                                 | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210239              | 0520         | 2 | F        | Including the Redundant UL NG-U UP TNL Information in the Modify                                                 | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210232              | 0533         | 1 | F        | Request Correction of SNPN failures                                                                              | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210232              | 0534         | 1 | F        | Update on QoS monitoring control                                                                                 | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210237              | 0537         | 2 | F        | Correction on RAT Information Handling                                                                           | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210237              | 0541         |   | F        | Correction of NAT information randing  Correction to NRPPa Transport procedure description                       | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210237              | 0544         | - | F        | Correction to NAFFA Transport procedure description  Correction on UE identity index for eMTC UE in RRC_INACTIVE | 16.5.0           |
| 2021-03            | RP-91-e            | RP-210237              | 0557         | 2 | F        | Clarification of Secondary RAT in mobility restrictions                                                          | 16.5.0           |
| 2021-05            | RP-92-e            | RP-211315              | 0477         | 3 | F        | Clarification on TAI Slice Support List                                                                          | 16.6.0           |
| 2021-06            | RP-92-e            | RP-211333              | 0522         | 3 | F        | Introducing Maximum Integrity Protected Data Rate after EPC to                                                   | 16.6.0           |
| 2021 00            | 111 32 0           | 111 211000             | 0322         | J | •        | 5GC handover                                                                                                     | 10.0.0           |
| 2021-06            | RP-92-e            | RP-211333              | 0547         | 2 | F        | Supporting use of UE Radio Capability for Paging in                                                              | 16.6.0           |
|                    |                    |                        |              |   |          | RRC_INACTIVE                                                                                                     |                  |
| 2021-06            | RP-92-e            | RP-211333              | 0556         | 2 | Α        | Interactions with other procedures for the UE TNLA BINDING                                                       | 16.6.0           |
|                    |                    |                        |              |   |          | RELEASE                                                                                                          |                  |
| 2021-06            | RP-92-e            | RP-211333              | 0574         | 1 | F        | Correction of PDU Session Resource Modification                                                                  | 16.6.0           |
| 2021-06            | RP-92-e            | RP-211334              | 0583         | 1 | Α        | Correction on Abnormal Conditions in Handover Preparation                                                        | 16.6.0           |
| 0004.00            | DD 00 -            | DD 044004              | 0000         | _ |          | Procedure for R16                                                                                                | 40.00            |
| 2021-06            | RP-92-e            | RP-211334              | 0603         | 2 | F        | Cause value on NG for insufficient UE capabilities CR 38.413                                                     | 16.6.0           |
| 2021-06            | RP-92-e            | RP-211333              | 0610         | - | F        | Correction on the use of the Core Network Assistance Information for RRC INACTIVE IE                             | 16.6.0           |
| 2021-06            | RP-92-e            | RP-211324              | 0614         | 2 | F        | Correction on Extended UE Identity Index Value                                                                   | 16.6.0           |
| 2021-09            | RP-93-e            | RP-211882              | 0376         | 7 | F        | NAS Non-Delivery                                                                                                 | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211881              | 0431         | 4 | F        | Correction on Expected UE activity behaviour                                                                     | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211881              | 0626         | - | F        | Correction of MICO mode                                                                                          | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211876              | 0631         | _ | F        | Correction of Mico Hode  Correcting Presence of the Cell CAG Information IE in ASN.1                             | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211882              | 0633         | 1 | A        | Deactivation of the MICO mode indication                                                                         | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211881              | 0637         | 1 | F        | Correction of NAS PDU Non Delivery                                                                               | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211882              | 0641         | 1 | F        | On IEs with reject criticality in the source and target transparent                                              | 16.7.0           |
|                    |                    |                        |              |   |          | container                                                                                                        |                  |
| 2021-09            | RP-93-e            | RP-211881              | 0645         | 1 | F        | Missing QoS Flows not Admitted List in HANDOVER COMMAND                                                          | 16.7.0           |
| 2021-09            | RP-93-e            | RP-211883              | 0646         | - | F        | Clarification on the specified maximum length of the Routing ID                                                  | 16.7.0           |
|                    |                    |                        |              |   |          | Octet String                                                                                                     |                  |
| 2021-09            | RP-93-e            | RP-211882              | 0660         |   | F        | Correction CR on Network instance                                                                                | 16.7.0           |
| 2021-12            | RP-94-e            | RP-212863              | 0663         | 1 | F        | Correction of Data Volume Report                                                                                 | 16.8.0           |
| 2021-12            | RP-94-e            | RP-212863              | 0671         | 1 | F        | Adding reference for coding of Common Network Instance                                                           | 16.8.0           |
| 2021-12            | RP-94-e            | RP-212869              | 0679         | 1 | F        | Clarification of UE with CAG information in UE subscription                                                      | 16.8.0           |
| 2021-12            | RP-94-e            | RP-212868              | 0688         | 1 | F        | (NGAP CR) support the UE Radio Capability for Paging in RACS                                                     | 16.8.0           |
| 0004 10            | DD 0.1             | DD 040074              | 0000         |   |          | Context                                                                                                          | 10.00            |
| 2021-12            | RP-94-e            | RP-212871              | 0693         | 1 | F        | Redundant network instance for split PDU session                                                                 | 16.8.0           |
| 2021-12            | RP-94-e            | RP-212864              | 0713         | 1 | F        | Allocation of TNL addresses for intra-system data forwarding                                                     | 16.8.0           |
| 2022-03            | RP-95-e            | RP-220278              | 0619         | 3 | <u> </u> | Support of dynamic ACL during handover and dual connectivity                                                     | 16.9.0           |
| 2022-03            | RP-95-e            | RP-220243              | 0691         | 2 | F        | Direct data forwarding for 4G to 5G handover                                                                     | 16.9.0           |
| 2022-03            | RP-95-e            | RP-220280              | 0727         | 1 | F        | Propagation of user consent related information during Xn inter-<br>PLMN handover                                | 16.9.0           |
| 2022-03            | RP-95-e            | RP-220278              | 0735         |   | F        | Correction on PDU Session Resource Setup procedure                                                               | 16.9.0           |
| 2022 00            |                    |                        |              |   |          |                                                                                                                  |                  |
| 2022-03            | RP-95-e            | RP-220279              | 0742         | 2 | F        | Correction of SNPN setup failure                                                                                 | 16.9.0           |

| 2022-03 | RP-95-e | RP-220280 | 0746 | 1  | F | Value range misalignment for MDT M1, M8 and M9 configuration    | 16.9.0 |
|---------|---------|-----------|------|----|---|-----------------------------------------------------------------|--------|
| 2022-03 | RP-95-e | RP-220279 | 0751 | 1  | F | Clarification of the usage of an IE in case of DAPS HO          | 16.9.0 |
| 2022-03 | RP-95-e | RP-220277 | 0752 | 1  | F | Correction of intra-system Data Forwarding                      | 16.9.0 |
| 2022-03 | RP-95-e | RP-220243 | 0760 | 2  | F | Direct data forwarding for mobility between DC and SA           | 16.9.0 |
| 2022-03 | RP-95-e | RP-220225 | 0490 | 10 | В | Introduction of NTN                                             | 17.0.0 |
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| 2022-03 | RP-95-e | RP-220220 | 0594 | 8  | В | Supporting enhanced private network                             | 17.0.0 |
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| 2022-03 | RP-95-e | RP-220229 | 0615 | 8  | В | CR to 38.413 on QoE measurement configuration                   | 17.0.0 |
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| 2022-03 | RP-95-e | RP-220236 | 0666 | 3  | D | NGAP rapporteur corrections                                     | 17.0.0 |
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| 2022-03 | RP-95-e | RP-220232 | 0682 | 5  | В | Supporting network slicing enhancement                          | 17.0.0 |
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| 2022-06 | RP-96   | RP-221145 | 0765 | 1  | D | NGAP rapporteur corrections                                     | 17.1.0 |
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| 2022-06 | RP-96   | RP-221134 | 0828 | 1  | F | NGAP corrections on MBS feature                                 | 17.1.0 |
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| 2022-06 | RP-96   | RP-221143 | 0841 | 2  | F | CR to 38.413 on corrections to configuration details            | 17.1.0 |
| 2022-06 | RP-96   | RP-221134 | 0843 | 1  | F | Introduction of broadcast session release required procedure    | 17.1.0 |
| 2022-06 | RP-96   | RP-221153 | 0851 | 2  | A | Correction to Frequency Band Info in MDT Configuration          | 17.1.0 |
| 2022-06 | RP-96   | RP-221141 | 0853 | -  | F | Inter-system energy saving corrections                          | 17.1.0 |
| 2022-06 | RP-96   | RP-221141 | 0854 | -  | F | Correction on user consent modification                         | 17.1.0 |
| 2022-06 | 55      | ==        |      |    | • | Table of Contents error update                                  | 17.1.1 |
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### History

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|------------------|-------------|-------------|--|--|--|--|--|
| V17.0.0          | May 2022    | Publication |  |  |  |  |  |
| V17.1.1          | August 2022 | Publication |  |  |  |  |  |
|                  |             |             |  |  |  |  |  |
|                  |             |             |  |  |  |  |  |
|                  |             |             |  |  |  |  |  |