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**Universal Mobile Telecommunications System (UMTS);
UTRAN Iu interface Radio Access Network Application Part
(RANAP) signalling
(3GPP TS 25.413 version 13.0.0 Release 13)**



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Foreword

This Technical Specification (TS) 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 called Radio Access Network Application Part (RANAP) for the Iu interface. RANAP supports the functions of Iu interface by signalling procedures defined in this document. RANAP is developed in accordance to the general principles stated in TR 23.930 [1], TS 25.410 [2] and TS 25.401 [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 23.930 (version.4.0.0, 2001-04): "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 48.008: "Mobile Switching Centre – Base Station System (MSC - BSS) interface; Layer 3 specification".
- [12] Void
- [13] ITU-T Recommendation X.691 (07/2002): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (07/2002): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (07/2002): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".

- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".
- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".
- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [25] GSM TS 12.20: "Base Station System (BSS) management information".
- [26] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".
- [27] 3GPP TS 43.051: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Overall description - Stage 2".
- [28] Void.
- [29] 3GPP TS 43.059: "Functional stage 2 description of Location Services (LCS) in GERAN".
- [30] 3GPP TS 22.071: "Location Services (LCS); Service description - Stage 1".
- [31] 3GPP TR 25.994 (version.5.0.0): "Measures employed by the UMTS Radio Access Network (UTRAN) to overcome early User Equipment (UE) implementation faults".
- [32] 3GPP TR 25.995 (version.5.0.0): "Measures employed by the UMTS Radio Access Network (UTRAN) to cater for legacy User Equipment (UE) which conforms to superseded versions of the RAN interface specification".
- [33] 3GPP TS 23.195 (version.5.4.0): "Provision of UE Specific Behaviour Information to Network Entities".
- [34] 3GPP TS 49.031: "Location Services (LCS) – Base Station System Application Part LCS Extension – (BSSAP-LE)".
- [35] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [36] 3GPP TS 48.018: "General Packet Radio Service (GPRS); BSS GPRS Protocol (BSSGP)".
- [37] 3GPP TS 32.421: "Subscriber and equipment trace: Trace concepts and requirements".
- [38] 3GPP TS 32.422: "Subscriber and equipment trace: Trace control and Configuration Management".
- [39] 3GPP TS 23.251: "Network sharing - Architecture and functional description".
- [40] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service; Stage 1".
- [41] 3GPP TS 23.246: "Multimedia Broadcast Multicast Service; Architecture and Functional Description".
- [42] 3GPP TS 25.346: "Introduction of the Multimedia Broadcast Multicast Service (MBMS) in the Radio Access Network (RAN); Stage 2".
- [43] 3GPP TS 23.172: "Technical realization of Circuit Switched (CS) multimedia service UDI/RDI fallback and service modification; Stage 2".
- [44] 3GPP TS 29.061 "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".
- [45] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control Protocol".

- [46] 3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".
- [47] 3GPP TS 43.055: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Dual Transfer Mode (DTM) - Stage 2".
- [48] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [49] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".
- [50] 3GPP TS 25.104: "Base Station (BS) radio transmission and reception(FDD)".
- [51] 3GPP TS 25.446: "MBMS Synchronisation Protocol(SYNC)".
- [52] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA), Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; stage 2".
- [53] 3GPP TS 23.007: "Restoration procedures"
- [54] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2"
- [55] 3GPP TS 25.467: "UTRAN architecture for 3G Home Node B (HNB) - Stage 2"
- [56] 3GPP TS 22.220: "Service requirements for Home Node Bs and Home eNode Bs".
- [57] 3GPP TS 29.060: "General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface".
- [58] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".
- [59] 3GPP TS 29.281: "General Packet Radio Service (GPRS); Tunnelling Protocol User Plane (GTPv1-U)".
- [60] 3GPP TS 33.102: "3G Security; Security architecture".
- [61] 3GPP TS 32.240: "Charging management; Charging architecture and principles".
- [62] 3GPP TS 52.008: "Telecommunication management; GSM subscriber and equipment trace".
- [63] 3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".
- [64] 3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".
- [65] 3GPP TS 23.139: "3GPP system – fixed broadband access network interworking".
- [66] BDS-SIS-ICD-2.0: "BeiDou Navigation Satellite System Signal In Space Interface Control Document Open Service Signal (Version 2.0)", December 2013.
- [67] 3GPP TS 23.272: "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".
- [68] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".
- [69] IETF RFC 4119: "A Presence-based GEOPRIV Location Object Format".
- [70] IETF RFC 5139: "Revised Civic Location Format for Presence Information Data Format Location Object".
- [71] IETF RFC 6848: "Specifying Civic Address Extensions in the Presence Information Data Format Location Object (PIDF-LO)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions below apply. Terms and definitions not defined below can be found in TR 21.905 [35].

Cell Load-Based Inter-System Handover: This mechanism, which is contained within a UTRAN RNC, consists of three primary functions:

1. The RNC has the capability to generate and send Cell Load Information towards the target/source system.
2. The RNC has the capability to receive Cell Load Information from the target/source system, and is able to interpret this information.
3. The ability of the RNC to make a handover decision by comparing the Cell Load Information that it has received from the target system with the Cell Load Information it has about its own cells.

Ciphering Alternative: defines both the Ciphering Status (started/not started) together with the Ciphering Algorithm considered altogether.

Core Network operator: as defined in TS 23.251 [39].

Corresponding RNC-ID: RNC-ID corresponding to an eNB ID, which enables a source RNC to address a target eNB for handover purposes via CN elements that cannot interpret an eNB ID (see TS 23.401 [48]).

CSG Cell: a UTRAN cell broadcasting a CSG Indicator and a CSG identity. This cell operates in Closed Access Mode as defined in TS 22.220 [56].

Default CN node: An RNC with an inactive or not implemented NAS Node Selection Function TS 23.236 [26] has one single permanent default CN node per CN domain. It always initiates the Initial UE Message procedure towards its default CN node. If the NAS Node Selection Function is active, then no Default CN node exists.

Directed retry: Directed retry is the process of assigning a User Equipment to a radio resource that does not belong to the serving RNC e.g. in situations of congestion. It is triggered by the RAB Assignment procedure and employs relocation procedures.

Elementary Procedure: RANAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the RNS and the CN. 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 stand alone procedures, which can be active in parallel. Examples on using several RANAP EPs together with each other and EPs from other interfaces can be found in reference TR 25.931 [4].

An EP consists of an initiating message and possibly a response message. Three kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success and/or failure).
- **Class 2:** Elementary Procedures without response.
- **Class 3:** Elementary Procedures with possibility of multiple responses.

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.

Class 3 EPs have one or several response messages reporting both successful, unsuccessful outcome of the requests and temporary status information about the requests. This type of EP only terminates through response(s) or EP timer expiry.

Enhanced relocation: denotes a method where the relocation of the SRNS functionality is prepared via RNSAP means. The CN is not informed until the preparation and execution of the relocation has taken place.

Gateway Core Network: as defined in TS 23.251 [39].

GERAN BSC in Iu mode: In the context of this specification no distinction between an UTRAN RNC and a GERAN BSC in Iu mode is made. The GERAN BSC in Iu mode will behave as a RNC unless explicitly stated (see TS 43.051 [27]).

Hybrid Cell: a UTRAN cell broadcasting a CSG Identity and operating in Hybrid Access Mode as defined in TS 22.220 [56].

Integrity Protection Alternative: defines both the Integrity Protection Status (started/not started) together with the Integrity Protection Algorithm considered altogether.

Local Home Network: as defined in TS 23.060 [21].

Management Based Activation: as defined in TS 32.421 [37].

MBMS Bearer Service: as defined in TS 23.246 [41].

MBMS Iu signalling connection: as defined in TS 25.346 [42].

MBMS RAB: as defined in TS 25.346 [42].

MBMS Service Area: as defined in TS 23.246 [41].

MBMS Service Context: as defined in TS 25.346 [42].

MBMS Session: as defined in TS 25.346 [42].

MBMS session start: as defined in TS 25.346 [42].

MBMS session stop: as defined in TS 25.346 [42].

Multicast Service: as defined in TS 22.146 [40].

Multi-Operator Core Network: as defined in TS 23.251 [39].

Network sharing non-supporting UE: as defined in TS 23.251 [39].

Network sharing supporting UE: as defined in TS 23.251 [39].

Packet System Information: as defined in TS 44.060 [46].

PUESBINE feature: as defined in TS 23.195 [33].

Relocation of SRNS: relocation of SRNS is a UMTS functionality used to relocate the serving RNS role from one RNS to another RNS. This UMTS functionality is realised by several elementary procedures executed in several interfaces and by several protocols and it may involve a change in the radio resources used between UTRAN and UE

It is also possible to relocate the serving RNS role from:

- one RNS within UMTS to another relocation target external to UMTS;
- functionality equivalent to the serving RNS role from another relocation source external to UMTS to another RNS.

RAN Information Management: as defined in TS 48.018 [36].

RNSAP Relocation: see definition in TS 25.467 [55].

Trace Recording Session: as defined in TS 32.421 [37].

Trace Recording Session Reference: as defined in TS 32.421 [37].

Trace Reference: as defined in TS 32.421 [37].

Trace Session: as defined in TS 32.421 [37].

Serving RNC: SRNC is the RNC belonging to SRNS

Serving RNS: role an RNS can take with respect to a specific connection between an UE and UTRAN. There is one serving RNS for each UE that has a connection to UTRAN. The serving RNS is in charge of the radio connection between a UE and the UTRAN. The serving RNS terminates the Iu for this UE

Signalling Based Activation: as defined in TS 32.421 [37].

Source RNC: source RNC is the RNC belonging to source RNS

Source RNS: role, with respect to a specific connection between UTRAN and CN, that RNS takes when it decides to initiate a relocation of SRNS

System Information in GERAN: as defined in TS 44.018 [45].

Target RNC: target RNC is the RNC belonging to target RNS

Target RNS: role an RNS gets with respect to a specific connection between UTRAN and CN when it is being a subject of a relocation of SRNS which is being made towards that RNS

UE Specific Behaviour Information – Iu: as defined in TS 23.195 [33].

3.2 Symbols

Void.

3.3 Abbreviations

Applicable abbreviations can be found in TR 21.905 [35]. For the purposes of the present document, the following abbreviations apply:

AAL2	ATM Adaptation Layer type 2
ALCAP	Access Link Control Application Part
APN	Access Point Name
AS	Access Stratum
ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
BDS	BeiDou Navigation Satellite System
BBF	Broadband Forum
BSC	Base Station Controller
CC	Call Control
CN	Core Network
CRNC	Controlling RNC
CS	Circuit Switched
CSG	Closed Subscriber Group
DCH	Dedicated Channel
DCN	Dedicated Core Network
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel

eNB	E-UTRA NodeB
EP	Elementary Procedure
E-UTRA	Evolved UTRA
E-UTRAN	Evolved UTRAN
GANSS	Galileo and Additional Navigation Satellite Systems
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
GWCN	GateWay Core Network
HNB	Home Node B
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
IRAT	Inter-RAT
L-GW	Local GateWay
LIPA	Local IP Access
LHN	Local Home Network
LHN ID	Local Home Network ID
MBMS	Multimedia Broadcast Multicast Service
MBS	Metropolitan Beacon System
MDT	Minimization of Drive Tests
MM	Mobility Management
MOCN	Multi Operator Core Network
MSC	Mobile services Switching Center
MSISDN	MS International PSTN/ISDN Number
NACC	Network Assisted Cell Change
NAS	Non Access Stratum
NNSF	NAS Node Selection Function
NRT	Non-Real Time
N-PDU	Network – Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PS	Packet Switched
PSI	Packet System Information
PTP	Point To Point
PUESBINE	Provision of UE Specific Behaviour Information to Network Entities
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RAT	Radio Access Technology
RIM	RAN Information Management
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
rSRVCC	reverse Single Radio Voice Call Continuity
RT	Real Time
SAI	Service Area Identifier
SAP	Service Access Point
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
S-GW	Serving GateWay
SI	System Information in GERAN
SIPTO	Selected IP Traffic Offload
SIPTO@LN	Selected IP Traffic Offload at the Local Network

SNA	Shared Network Area
SNAC	Shared Network Area Code
SRNC	Serving RNC
SRNS	Serving RNS
SRVCC	Single Radio Voice Call Continuity
TEID	Tunnel Endpoint Identifier
TMGI	Temporary Mobile Group Identity
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
UESBI-Iu	UE Specific Behaviour Information - Iu
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network

4 General

4.1 Procedure Specification Principles

The principle for specifying the procedure logic is to specify the functional behaviour of the RNC exactly and completely. The CN functional behaviour is left unspecified. The EPs Relocation Preparation, Reset, Reset Resource and Overload Control are exceptions from this principle.

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 of Class 3 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 section 10. For examples on how to use the *Criticality Diagnostics* IE, see Annex A.2.

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. RAB Assignment 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. RAB ASSIGNMENT REQUEST message.
IE	When referring to an information element (IE) in the specification the <i>Information Element Name</i> is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. <i>User Plane Mode</i> IE.
Value of an IE	When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in subclause 9.2 enclosed by quotation marks, e.g. "Abstract Syntax Error (Reject)" or "Geographical Coordinates".

5 RANAP Services

RANAP provides the signalling service between UTRAN or GERAN (in Iu mode) and CN that is required to fulfil the RANAP functions described in clause 7. RANAP services are divided into four groups. The first three are based on Service Access Points (SAP) defined in TS 23.110 [16]:

1. General control services: They are related to the whole Iu interface instance between RNC and logical CN domain, and are accessed in CN through the General Control SAP. They utilise connectionless signalling transport provided by the Iu signalling bearer.
2. Notification services: They are related to specified UEs or all UEs in specified area, and are accessed in CN through the Notification SAP. They utilise connectionless signalling transport provided by the Iu signalling bearer.
3. Dedicated control services: They are related to one UE, and are accessed in CN through the Dedicated Control SAP. RANAP functions that provide these services are associated with Iu signalling connection that is maintained for the UE in question. The Iu signalling connection is realised with connection oriented signalling transport provided by the Iu signalling bearer.
4. MBMS control services: They are related to one MBMS Bearer Service. RANAP functions that provide these services are associated with one or several Iu signalling connection that is maintained for the MBMS Bearer Service in question during the MBMS Session. The Iu signalling connection is realised with connection oriented signalling transport provided by the Iu signalling bearer.

6 Services Expected from Signalling Transport

Signalling transport (See TS 25.412 [5]) shall provide two different service modes for the RANAP.

1. Connection oriented data transfer service. This service is supported by a signalling connection between RNC and CN domain. It shall be possible to dynamically establish and release signalling connections based on the need. Each active UE shall have its own signalling connection. Each MBMS Bearer Service during a given MBMS Session shall have one or several signalling connections. The signalling connection shall provide in sequence delivery of RANAP messages. RANAP shall be notified if the signalling connection breaks.
2. Connectionless data transfer service. RANAP shall be notified in case a RANAP message did not reach the intended peer RANAP entity.

7 Functions of RANAP

RANAP protocol has the following functions:

- Relocating serving RNC. This function enables to change the serving RNC functionality as well as the related Iu resources (RAB(s) and Signalling connection) from one RNC to another.
- Overall RAB management. This function is responsible for setting up, modifying and releasing RABs.
- Queuing the setup of RAB. The purpose of this function is to allow placing some requested RABs into a queue, and indicate the peer entity about the queuing.
- Requesting RAB release. While the overall RAB management is a function of the CN, the RNC has the capability to request the release of RAB.
- Release of all Iu connection resources. This function is used to explicitly release all resources related to one Iu connection.
- Requesting the release of all Iu connection resources. While the Iu release is managed from the CN, the RNC has the capability to request the release of all Iu connection resources from the corresponding Iu connection.
- SRNS context forwarding function. This function is responsible for transferring SRNS context from the RNC to the CN for intersystem change in case of packet forwarding.
- Controlling overload in the Iu interface. This function allows adjusting the load in the control plane of the Iu interface.
- Resetting the Iu. This function is used for resetting an Iu interface.
- Sending the UE Common ID (permanent NAS UE identity) to the RNC. This function makes the RNC aware of the UE's Common ID.
- Paging the user. This function provides the CN for capability to page the UE.
- Controlling the tracing of the subscriber or user equipment activity. This function allows setting the trace mode for a given subscriber or user equipment. This function also allows the deactivation of a previously established trace.
- MDT function. This function is to enable the transfer of MDT measurements collected by the UE.
- Transport of NAS information between UE and CN (see TS 24.008 [8]). This function has two sub-classes:
 1. Transport of the initial NAS signalling message from the UE to CN. This function transfers transparently the NAS information. As a consequence also the Iu signalling connection is set up.
 2. Transport of NAS signalling messages between UE and CN, This function transfers transparently the NAS signalling messages on the existing Iu signalling connection. It also includes a specific service to handle signalling messages differently.
- Controlling the security mode in the UTRAN. This function is used to send the security keys (ciphering and integrity protection) to the UTRAN, and setting the operation mode for security functions.
- Controlling location reporting. This function allows the CN to operate the mode in which the UTRAN reports the location of the UE.
- Location reporting. This function is used for transferring the actual location information from RNC to the CN.
- Data volume reporting function. This function is responsible for reporting unsuccessfully transmitted DL data volume over UTRAN for specific RABs.
- Reporting general error situations. This function allows reporting of general error situations, for which function specific error messages have not been defined.

- Location related data. This function allows the CN to either retrieve from the RNC deciphering keys (to be forwarded to the UE) for the broadcast assistance data, or request the RNC to deliver dedicated assistance data to the UE.
- Information Transfer. This function allows the CN to transfer information to the RNC.
- Uplink Information Exchange. This function allows the RNC to transfer or request information to the CN. For instance the RNC has the capability to request MBMS specific information to the CN e.g. the Multicast Service lists for a given UE or the IP Multicast Address and APN for one or several MBMS Bearer Services.
- MBMS RANAP overall function. This function allows the following different sub-functions:
 - MBMS RAB management. This function is responsible for setting up, updating and releasing the MBMS RAB as well as the MBMS Iu signalling connection corresponding to one MBMS Session. The MBMS RAB is defined for the CN PS domain only.
 - MBMS CN (PS domain) de-registration. This function makes the RNC aware that a given Multicast Service is no longer available.
 - MBMS UE linking/de-linking. This function makes the RNC aware that a given UE, with existing Iu-ps signalling connection, has joined/left some Multicast Service(s).
 - Requesting MBMS Service registration/de-registration. While the overall MBMS CN de-registration is a function of the CN (PS domain), the RNC has the capability to register/de-register to a specific Multicast Service.

These functions are implemented by one or several RANAP elementary procedures described in the following clause.

8 RANAP Procedures

8.1 Elementary Procedures

In the following tables, all EPs are divided into Class 1, Class 2 and Class 3 EPs (see subclause 3.1 for explanation of the different classes):

Table 1: Class 1

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Iu Release	IU RELEASE COMMAND	IU RELEASE COMPLETE	
Relocation Preparation	RELOCATION REQUIRED	RELOCATION COMMAND	RELOCATION PREPARATION FAILURE
Relocation Resource Allocation	RELOCATION REQUEST	RELOCATION REQUEST ACKNOWLEDGE	RELOCATION FAILURE
Relocation Cancel	RELOCATION CANCEL	RELOCATION CANCEL ACKNOWLEDGE	
SRNS Context Transfer	SRNS CONTEXT REQUEST	SRNS CONTEXT RESPONSE	
Security Mode Control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	SECURITY MODE REJECT
Data Volume Report	DATA VOLUME REPORT REQUEST	DATA VOLUME REPORT	
Reset	RESET	RESET ACKNOWLEDGE	
Reset Resource	RESET RESOURCE	RESET RESOURCE ACKNOWLEDGE	
Location related Data	LOCATION RELATED DATA REQUEST	LOCATION RELATED DATA RESPONSE	LOCATION RELATED DATA FAILURE
Information Transfer	INFORMATION TRANSFER INDICATION	INFORMATION TRANSFER CONFIRMATION	INFORMATION TRANSFER FAILURE
Uplink Information Exchange	UPLINK INFORMATION EXCHANGE REQUEST	UPLINK INFORMATION EXCHANGE RESPONSE	UPLINK INFORMATION EXCHANGE FAILURE
MBMS Session Start	MBMS SESSION START	MBMS SESSION START RESPONSE	MBMS SESSION START FAILURE
MBMS Session Update	MBMS SESSION UPDATE	MBMS SESSION UPDATE RESPONSE	MBMS SESSION UPDATE FAILURE
MBMS Session Stop	MBMS SESSION STOP REQUEST	MBMS SESSION STOP RESPONSE	
MBMS UE Linking	MBMS UE LINKING REQUEST	MBMS UE LINKING RESPONSE	
MBMS Registration	MBMS REGISTRATION REQUEST	MBMS REGISTRATION RESPONSE	MBMS REGISTRATION FAILURE
MBMS CN De-Registration	MBMS CN DE-REGISTRATION REQUEST	MBMS CN DE-REGISTRATION RESPONSE	
MBMS RAB Release	MBMS RAB RELEASE REQUEST	MBMS RAB RELEASE	MBMS RAB RELEASE FAILURE
Enhanced Relocation Complete	ENHANCED RELOCATION COMPLETE REQUEST	ENHANCED RELOCATION COMPLETE RESPONSE	ENHANCED RELOCATION COMPLETE FAILURE
SRVCC Preparation	SRVCC CS KEYS REQUEST	SRVCC CS KEYS RESPONSE	
UE Radio Capability Match	UE RADIO CAPABILITY MATCH REQUEST	UE RADIO CAPABILITY MATCH RESPONSE	
UE Registration Query	UE REGISTRATION QUERY REQUEST	UE REGISTRATION QUERY RESPONSE	

Table 2: Class 2

Elementary Procedure	Message
RAB Modification Request	RAB MODIFY REQUEST
RAB Release Request	RAB RELEASE REQUEST
Iu Release Request	IU RELEASE REQUEST
Relocation Detect	RELOCATION DETECT
Relocation Complete	RELOCATION COMPLETE
SRNS Data Forwarding Initiation	SRNS DATA FORWARD COMMAND
SRNS Context Forwarding from Source RNC to CN	FORWARD SRNS CONTEXT
SRNS Context Forwarding to Target RNC from CN	FORWARD SRNS CONTEXT
Paging	PAGING
Common ID	COMMON ID
CN Invoke Trace	CN INVOKE TRACE
CN Deactivate Trace	CN DEACTIVATE TRACE
Location Reporting Control	LOCATION REPORTING CONTROL
Location Report	LOCATION REPORT
Initial UE Message	INITIAL UE MESSAGE
Direct Transfer	DIRECT TRANSFER
Overload Control	OVERLOAD
Error Indication	ERROR INDICATION
UE Specific Information	UE SPECIFIC INFORMATION INDICATION
Direct Information Transfer	DIRECT INFORMATION TRANSFER
MBMS RAB Establishment Indication	MBMS RAB ESTABLISHMENT INDICATION
Enhanced Relocation Complete Confirm	ENHANCED RELOCATION COMPLETE CONFIRM
Reroute NAS Request	REROUTE NAS REQUEST

Table 3: Class 3

Elementary Procedure	Initiating Message	Response Message
RAB Assignment	RAB ASSIGNMENT REQUEST	RAB ASSIGNMENT RESPONSE x N (N>=1)

The following applies concerning interference between Elementary Procedures:

- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

8.2 RAB Assignment

8.2.1 General

The purpose of the RAB Assignment procedure is to establish new RABs and/or to enable modifications and/or releases of already established RABs for a given UE. The procedure uses connection oriented signalling.

8.2.2 Successful Operation

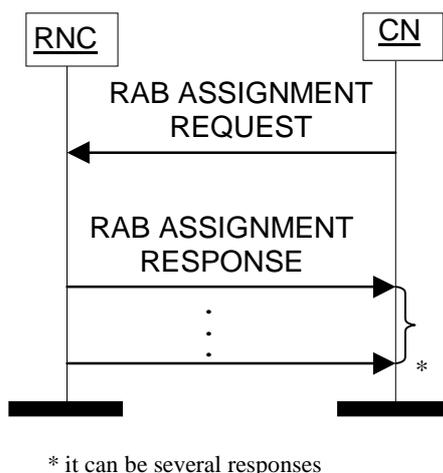


Figure 1: RAB Assignment procedure. Successful operation.

The CN initiates the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T_{RABAssgt} timer.

The CN may request the UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

The CN shall include in the RAB ASSIGNMENT REQUEST message at least one request to either establish/modify or release a RAB.

The message shall contain the information required by the UTRAN to build the new RAB configuration, such as:

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release;
- UE Aggregate Maximum Bit Rate (if available).

For each RAB requested to be established, the message shall contain:

- RAB ID;
- NAS Synchronisation Indicator (only when available);
- RAB parameters (including e.g. Allocation/Retention Priority);
- User Plane Information (i.e. required User Plane Mode and required UP Mode Versions);
- Transport Layer Information;
- PDP Type Information (only for PS) or PDP Type Information extension (only for PS);
- Data Volume Reporting Indication (only for PS);
- DL GTP-PDU sequence number (only when GTP-PDU sequence number is available in cases of intersystem change from GPRS to UMTS or when establishing a RAB for an existing PDP context or in some further cases described in TS 23.060 [21]);

- UL GTP-PDU sequence number (only when GTP-PDU sequence number is available in cases of intersystem change from GPRS to UMTS or when establishing a RAB for an existing PDP context or in some further cases described in TS 23.060 [21]);
- DL N-PDU sequence number (only when N-PDU sequence number is available in case of intersystem change from GPRS to UMTS or in some further cases described in TS 23.060 [21]);
- UL N-PDU sequence number (only when N-PDU sequence number is available in case of intersystem change from GPRS to UMTS or in some further cases described in TS 23.060 [21]).

The RAB ASSIGNMENT REQUEST message shall, if supported, include the *Correlation ID* IE for each RAB established towards a L-GW collocated with the RNC for LIPA operation.

If the *SIPTO Correlation ID* IE is included in the RAB ASSIGNMENT REQUEST message towards the RNC with L-GW function for SIPTO@LN operation, the RNC shall use it for SIPTO@LN operation for the concerned RAB.

For each RAB requested to be modified, the message may contain:

- RAB ID (mandatory);
- NAS Synchronisation Indicator;
- RAB parameters;
- Transport Layer Information;
- User Plane Information.

If the *UE Aggregate Maximum Bit Rate* IE is present in the RAB ASSIGNMENT REQUEST message, the UTRAN shall, if supported, store the received UE Aggregate Maximum Bit Rate parameters to control the aggregate data rate of non-GBR traffic for this UE.

The *Transport Layer Information* IE may be present at a RAB modification except in the case when the only other present IE, besides the *RAB ID* IE, is the *NAS Synchronisation Indicator* IE.

At a RAB modification that does not include transfer of the *NAS Synchronisation Indicator* IE, the *RAB Parameters* IE shall be present in the RAB ASSIGNMENT REQUEST message only when any previously set value for this IE is requested to be modified.

At a RAB modification, the *User Plane Information* IE shall be present in the RAB ASSIGNMENT REQUEST message only when any previously set value for this IE is requested to be modified.

For a RAB setup, the *SDU Format Information Parameter* IE in the *RAB Parameters* IE shall be present only if the *User Plane Mode* IE is set to "support mode for pre-defined SDU sizes" and the *Traffic Class* IE is set to either "Conversational" or "Streaming".

For a RAB setup or modification, when the maximum bit rate (respectively the guaranteed bit rate when applicable) to be signalled for the RAB exceeds the maximum value of the *Maximum Bit Rate* IE (respectively *Guaranteed Bit Rate* IE), either the *Extended Maximum Bit Rate* IE (respectively *Extended Guaranteed Bit Rate* IE) shall be included together with the *Maximum Bit Rate* IE (respectively *Guaranteed Bit Rate* IE) set to its maximum value or the *Supported Maximum Bit Rate* IE (respectively *Supported Guaranteed Bit Rate* IE) shall be used.

For a RAB setup or modification, if the *Extended Maximum Bit Rate* IE (respectively *Extended Guaranteed Bit Rate* IE) is present, the RNC shall consider it and ignore the *Maximum Bit Rate* IE (respectively *Guaranteed Bit Rate* IE).

For a RAB if *Extended Maximum Bit Rate* IE (respectively *Extended Guaranteed Bit Rate* IE when applicable) is signalled in one direction RNC shall use the *Extended Maximum Bit Rate* IE (respectively *Extended Guaranteed Bit Rate* IE) also for the other direction for this RAB. If the *Supported Maximum Bit Rate* IE (respectively *Supported Guaranteed Bit Rate* IE) is present, it shall be used in both directions.

For a RAB setup or modification, if the *Supported Maximum Bit Rate* IE (respectively *Supported Guaranteed Bit Rate* IE) is present, the RNC shall consider it and ignore the *Maximum Bit Rate* IE (respectively *Guaranteed Bit Rate* IE).

For a RAB setup, the *RAB Parameters* IE may contain the *Signalling Indication* IE. The *Signalling Indication* IE shall not be present if the *Traffic Class* IE is not set to "Interactive" or if the *CN Domain Indicator* IE is not set to "PS domain".

If the *RAB Parameters* IE is present for a RAB modification, the *SDU Format Information Parameter* IE in the *RAB Parameters* IE shall be present only if the *Traffic Class* IE is set to either "Conversational" or "Streaming" and if

- either the User Plane mode is currently "support mode for pre-defined SDU sizes" and the *User Plane Mode* IE is not contained in the RAB ASSIGNMENT REQUEST message
- or if the *User Plane Mode* IE optionally contained within the RAB ASSIGNMENT REQUEST message is set to "support mode for pre-defined SDU sizes".

If, for a RAB requested to be modified, one (or more) of these IEs except *RAB ID* IE are not present in the RAB ASSIGNMENT REQUEST message the RNC shall continue to use the value(s) currently in use for the not present IEs.

If, for a RAB requested to be modified, the *Signalling Indication* IE is not present and the *Traffic Class* IE is set to "interactive", this indicates that the signalling nature of the RAB is not changed by the modification.

For each RAB requested to be released, the message shall contain:

- RAB ID;
- Cause.

Upon reception of the RAB ASSIGNMENT REQUEST message, the UTRAN shall execute the requested RAB configuration. The CN may indicate that RAB QoS negotiation is allowed for certain RAB parameters and in some cases also which alternative values to be used in the negotiation in the *Alternative RAB parameters values* IE.

If some of the alternative maximum bit rates (respectively alternative guaranteed bit rates when applicable) to be signalled for the RAB exceed the maximum value of the *Alternative Maximum Bit Rate* IE (respectively *Alternative Guaranteed Bit Rate* IE), they shall be included either in the *Extended Alternative Maximum Bit Rate* IE (respectively *Extended Alternative Guaranteed Bit Rate* IE), or in the *Supported Alternative Maximum Bit Rate* IE (respectively *Supported Alternative Guaranteed Bit Rate* IE). If the *Supported Alternative Maximum Bit Rate* IE (respectively *Supported Alternative Guaranteed Bit Rate* IE) is used it shall be used for all alternative bitrate definitions for the RAB.

For a RAB setup or modification, if the *Extended Alternative Maximum Bit Rate* IE (respectively *Extended Alternative Guaranteed Bit Rate* IE) is present, the RNC shall consider these rates together with the bit rates signalled within the *Alternative Maximum Bit Rate* IE (respectively *Alternative Guaranteed Bit Rate* IE) if present.

For an entry in the list or for a discrete value if the *Extended Alternative Maximum Bit Rate* IE (respectively *Extended Alternative Guaranteed Bit Rate* IE when applicable) is signalled in one direction RNC shall use the *Extended Alternative Maximum Bit Rate* IE (respectively *Extended Alternative Guaranteed Bit Rate* IE) also for the other direction of this entry or discrete value. If the *Supported Alternative Maximum Bit Rate* IE (respectively *Supported Alternative Guaranteed Bit Rate* IE) is present it shall be used in both directions for all entries in the list or discrete values.

For a RAB setup or RAB requested to be modified, the RAB ASSIGNMENT REQUEST message may also include an alternative RAB configuration specified in the *Alternative RAB configuration* IE in the *Alternative RAB Parameter Values* IE. If *Alternative RAB configuration* IE for a RAB is included in the RAB ASSIGNMENT REQUEST message, the RNC is allowed after the successful RAB setup or RAB modification to request the CN to trigger the execution of this alternative RAB configuration. No negotiation is allowed during the RAB Assignment procedure between the requested RAB configuration and this alternative RAB configuration.

If the RAB ASSIGNMENT REQUEST message contains a request of a RAB configuration with *Extended Maximum Bit Rate* IE and/or *Extended Guaranteed Bit Rate* IE respectively if *Supported Maximum Bit Rate* IE and/or *Supported Guaranteed Bit Rate* IE are greater than 16 Mbps in *RAB parameters* IE, the CN should indicate that RAB QoS negotiation is allowed. If this RAB Configuration is for a UE that is not able to support the requested bit rates according to the *Access Stratum Release Indicator* IE in TS 25.331 [10]:

- The UTRAN shall, if supported, perform RAB QoS negotiation.
- If RAB QoS negotiation is performed, the RNC shall signal the assigned bit rate indications within the *Assigned RAB Parameter Values* IE in the following way:
 - *Extended Assigned Maximum Bit Rate* IE and *Extended Assigned Guaranteed Bit Rate* IE shall not be set in *Assigned RAB Parameter Values* IE;

- if the *Supported Assigned Maximum Bit Rate IE* and *Supported Assigned Guaranteed Bit Rate IE* are used, they shall be set to a value less than or equal to 16 Mbps.

The same RAB ID shall only be present once in the whole RAB ASSIGNMENT REQUEST message.

The RAB ID shall uniquely identify the RAB for the specific CN domain and for the particular UE, which makes the RAB ID unique over the Iu connection on which the RAB ASSIGNMENT REQUEST message is received. When a RAB ID already in use over that particular Iu instance is used, the procedure is considered as modification of that RAB.

The RNC shall pass the contents of the *RAB ID IE* to the radio interface protocol for each RAB requested to be established or modified.

The RNC shall establish or modify the resources according to the values of the *Allocation/Retention Priority IE* (priority level, pre-emption indicators, queuing) and the resource situation as follows:

- The RNC shall consider the priority level of the requested RAB, when deciding on the resource allocation.
- If the requested RAB is allowed for queuing and the resource situation requires so, the RNC may place the RAB in the establishment queue.
- The priority levels and the pre-emption indicators may (singularly or in combination) be used to determine whether the RAB assignment has to be performed unconditionally and immediately. If the requested RAB is marked as "may trigger pre-emption" and the resource situation requires so, the RNC may trigger the pre-emption procedure which may then cause the forced release of a lower priority RAB which is marked as "pre-emptable". Whilst the process and the extent of the pre-emption procedure is operator-dependent, the pre-emption indicators, if given in the RAB ASSIGNMENT REQUEST message, 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 connection shall be included in the pre-emption process.
 5. If the *Pre-emption Vulnerability IE* is set to "not pre-emptable", then this connection shall not be included in the pre-emption process.
 6. If the *Priority Level IE* is set to "no priority" the given values for the *Pre-emption Capability IE* and *Pre-emption Vulnerability IE* shall not be considered. Instead the values "shall not trigger pre-emption" and "not pre-emptable" shall prevail.
- If the *Allocation/Retention Priority IE* is not given in the RAB ASSIGNMENT REQUEST message, the allocation request shall not trigger the pre-emption process and the connection may be pre-empted and considered to have the value "lowest" as priority level. Moreover, queuing shall not be allowed.
- The UTRAN pre-emption process shall keep the following rules:
 1. UTRAN shall only pre-empt RABs with lower priority, in ascending order of priority.
 2. The pre-emption may be done for RABs belonging to the same UE or to other UEs.

If the *NAS Synchronisation Indicator IE* is contained in the RAB ASSIGNMENT REQUEST message, the RNC shall pass it to the radio interface protocol for transfer to the UE.

If the RAB ASSIGNMENT REQUEST message includes the *PDP Type Information IE* or *PDP Type Information extension IE*, the UTRAN may use it to configure any compression algorithms.

If included, the *Service Handover IE* tells if the requested RAB

- should be handed over to GSM, i.e. from a NAS point of view, the requested RAB should be handed over to GSM as soon as possible although the final decision whether to perform a handover to GSM is still made in the UTRAN.

- should not be handed over to GSM, i.e. from a NAS point of view, the requested RAB should remain in UMTS as long as possible although the final decision whether to perform a handover to GSM is still made in the UTRAN.
- shall not be handed over to GSM, i.e. the requested RAB shall never be handed over to GSM. This means that the UTRAN shall not initiate handover to GSM for the UE unless the RABs with this indication have first been released with the normal release procedures.

The value of the *Service Handover* IE is valid throughout the lifetime of the RAB or until changed by a RAB modification.

The *Service Handover* IE shall only influence decisions made regarding UTRAN-initiated inter-system handovers.

If the *Service Handover* IE is not included during RAB Setup and all subsequent RAB Modifications, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

If included, the *E-UTRAN Service Handover* IE tells if the requested RAB is allowed to be handed over to E-UTRAN.

If the E-UTRAN service handover function is supported,

- The RNC shall not trigger handover or redirection to E-UTRAN for a UE with a signalling connection only;
- The RNC shall not trigger handover or redirection to E-UTRAN for a UE if all established RABs have *E-UTRAN Service Handover* IE set to 'Handover to E-UTRAN shall not be performed'.

The value of the *E-UTRAN Service Handover* IE is valid throughout the lifetime of the RAB or until changed by a RAB modification.

If the *E-UTRAN Service Handover* IE is not included during RAB Setup and all subsequent RAB Modifications, the decision whether to perform an inter-system mobility to E-UTRAN, e.g., handover or redirection, is only an internal UTRAN matter.

The UTRAN shall report to the CN, in the first RAB ASSIGNMENT RESPONSE message, the result for all the requested RABs, such as:

- List of RABs successfully established or modified.
- List of RABs released.
- List of RABs queued.
- List of RABs failed to establish or modify.
- List of RABs failed to release.

The same RAB ID shall only be present once in the whole RAB ASSIGNMENT RESPONSE message.

For each RAB successfully established towards the PS domain or towards the CS domain when an ALCAP is not used, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully released towards the PS domain, for which data volume reporting had been requested when the RAB was established, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message. The *DL Data Volumes* IE shall contain in the *Unsuccessfully Transmitted DL Data Volume* IE the total amount of unsuccessfully transmitted DL data for the RAB since its establishment and may contain the *Data Volume Reference* IE.

For each RAB successfully released towards the PS domain, the RNC shall include in the RAB ASSIGNMENT RESPONSE message the *DL GTP-PDU Sequence Number* IE and the *UL GTP-PDU Sequence Number* IE, if available and if the release was initiated by the UTRAN.

The RNC shall report in the RAB ASSIGNMENT RESPONSE message at least one RAB:

- setup/modified or
- released or

- queued or
- failed to setup/modify or
- failed to release.

If any alternative RAB parameter values have been used when establishing or modifying a RAB, these RAB parameter values shall be included in the RAB ASSIGNMENT RESPONSE message within the *Assigned RAB Parameter Values* IE.

If any alternative RAB parameter values have been used from the *Extended Alternative Maximum Bit Rate* IE (respectively *Extended Alternative Guaranteed Bit Rate* IE), these RAB parameter values shall be included in the RAB ASSIGNMENT RESPONSE message within the *Extended Assigned Maximum Bit Rate* IE (respectively *Extended Assigned Guaranteed Bit Rate* IE).

For a RAB if the *Extended Assigned Maximum Bit Rate* IE (respectively *Extended Assigned Guaranteed Bit Rate* IE when applicable) is signalled in one direction RNC shall signal the *Extended Assigned Maximum Bit Rate* IE (respectively *Extended Assigned Guaranteed Bit Rate* IE) also in the other direction for this RAB. If the *Supported Assigned Maximum Bit Rate* IE (respectively *Supported Assigned Guaranteed Bit Rate* IE) is used it shall be used in both directions.

If any alternative RAB parameter values have been used from the *Supported Alternative Maximum Bit Rate Information* IE (respectively *Supported Alternative Guaranteed Bit Rate Information* IE), these RAB parameter values shall be included in the RAB ASSIGNMENT RESPONSE message within the *Supported Assigned Maximum Bit Rate* IE (respectively *Supported Assigned Guaranteed Bit Rate* IE).

For the CS domain, when an ALCAP is used, UTRAN shall report the successful outcome of a specific RAB to establish or modify only after the Iu user plane at RNL level is ready to be used in UL and DL. At a RAB establishment, the transport network control plane signalling required to set up the transport bearer shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification when *Transport Layer Address* (IE) and *Iu Transport Association* IEs are included, the RNC shall establish a new transport bearer. The transport network control plane signalling shall then use the included *Transport Layer Address* IE and *Iu Transport Association* IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If *Transport Layer Address* (IE) and *Iu Transport Association* IEs are not included, then the RNC may modify the already existing transport bearer.

For the PS domain or for the CS domain when an ALCAP is not used, when they are present at a RAB modification, the RNC shall use the embedded *Transport Layer Address* IE and *Iu Transport Association* IEs as the termination point of the new transport bearer.

For the PS domain or for the CS domain when an ALCAP is not used, for each RAB successfully modified, if the RNC has changed the *Transport Layer Address* IE and/or the *Iu Transport Association* IE, it shall include the new value(s) in the RAB ASSIGNMENT RESPONSE message.

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane, if necessary.

Re-initialisation of the user plane shall not be performed if:

- the *RAB Parameters* IE is not included, for example during transfer of *NAS Synchronisation Indicator* IE;
- the *RAB Parameters* IE is included but the *SDU Format Information Parameter* IE is not changed for the existing RAB and the *NAS Synchronisation Indicator* IE is not included.

Re-initialisation of the user plane shall be performed if the *RAB Parameters* IE and *NAS Synchronisation Indicator* IE are included.

If the RNC can not initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the rules for initialisation of the respective user plane mode versions, as described in TS 25.415 [6], the RAB Assignment shall fail with the cause value "RNC unable to establish all RFCs".

In case of establishment of a RAB for the PS domain, the CN must be prepared to receive user data before the RAB ASSIGNMENT RESPONSE message has been received.

If none of the RABs have been queued, the CN shall stop timer $T_{RABAssgt}$ and the RAB Assignment procedure terminates. In that case, the procedure shall also be terminated in the UTRAN.

When the request to establish or modify one or several RABs is put in a queue, the UTRAN shall start the timer $T_{QUEUING}$. This timer specifies the maximum time for queuing of the request for establishment or modification. The same timer $T_{QUEUING}$ supervises all RABs of the request being queued.

For each RAB that is queued the following outcomes are possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer $T_{QUEUING}$.

For RABs indicated as queued in the first RAB ASSIGNMENT RESPONSE message, the UTRAN shall report the outcome of the queuing for every RAB individually or for several RABs in subsequent RAB ASSIGNMENT RESPONSE message(s). This is left to implementation. The UTRAN shall stop $T_{QUEUING}$ when all RABs have been either successfully established or modified or failed to establish or modify. The RAB Assignment procedure is then terminated both in the CN and the UTRAN when all RABs have been responded to.

When the CN receives the response that one or several RABs are queued, it shall expect the UTRAN to provide the outcome of the queuing function for each RAB before expiry of the $T_{RABAssgt}$ timer. In case the timer $T_{RABAssgt}$ expires, the CN shall consider the RAB Assignment procedure terminated and the RABs not reported shall be considered as failed.

In case the timer $T_{QUEUING}$ expires, the RAB Assignment procedure terminates in the UTRAN for all queued RABs, and the UTRAN shall respond for all of them in one RAB ASSIGNMENT RESPONSE message. The RAB Assignment procedure shall also be terminated in the CN.

In case a request to modify or release a RAB contains the RAB ID of a RAB being queued, the RAB shall be taken out of the queue and treated according to the second request. The first request shall be responded to as a RAB failed to setup or modify with the cause value "Request superseded".

If the UTRAN failed to modify a RAB, it shall keep the RAB as it was configured prior to the modification request.

When UTRAN reports unsuccessful establishment/modification of a RAB, the cause value should be precise enough to enable the core network to know the reason for unsuccessful establishment/modification. Typical cause values are: "Requested Traffic Class not Available", "Invalid RAB Parameters Value", "Requested Maximum Bit Rate not Available", "Requested Maximum Bit Rate for DL not Available", "Requested Maximum Bit Rate for UL not Available", "Requested Guaranteed Bit Rate not Available", "Requested Guaranteed Bit Rate for DL not Available", "Requested Guaranteed Bit Rate for UL not Available", "Requested Transfer Delay not Achievable", "Invalid RAB Parameters Combination", "Condition Violation for SDU Parameters", "Condition Violation for Traffic Handling Priority", "Condition Violation for Guaranteed Bit Rate", "User Plane Versions not Supported", "Iu UP Failure", "Iu Transport Connection Failed to Establish", " $T_{QUEUING}$ Expiry".

If the RAB ID of a RAB requested to be released is unknown in the RNC, this shall be reported as a RAB failed to release with the cause value "Invalid RAB ID".

The RNC may indicate an impending directed retry attempt to GSM by sending a RAB ASSIGNMENT RESPONSE message with a RAB ID included in the list of RABs failed to setup and a cause value of "Directed Retry".

The RNC shall be prepared to receive a RAB ASSIGNMENT REQUEST message containing a *RABs To Be Released* IE at any time and shall always reply to it. If there is an ongoing RAB Assignment procedure for a RAB indicated within the *RABs To Be Released* IE, the RNC shall discard the preceding RAB Assignment procedure for that specific RAB, release any related resources and report the released RAB within the RAB ASSIGNMENT RESPONSE message.

After sending a RAB ASSIGNMENT RESPONSE message containing RAB ID within the *RABs Released* IE, the RNC shall be prepared to receive a new establishment request for a RAB identified by the same RAB ID.

In case SIPTO at Iu-PS functionality is supported by the UTRAN, the following applies in addition for the successful operation of the RAB Assignment procedure:

- If the *MSISDN* IE is present in the RAB ASSIGNMENT REQUEST message, then the UTRAN may offload the RAB(s) where the *Offload RAB Parameters* IE is present in the *RABs To Be Setup Or Modified Item IEs* IE. The

Access Point Name IE and the *Charging Characteristics* IE within the *Offload RAB Parameters* IE and the *MSISDN* IE may only be used for the SIPTO at Iu-PS function and according to the description in TS 23.060 [21].

8.2.2.1 Successful Operation for GERAN Iu-mode

For GERAN Iu-mode the following shall apply in addition for the successful operation of the RAB Assignment procedure:

- In case of GERAN Iu-mode, for a RAB requested to be setup or modified from the CS domain, the RAB ASSIGNMENT REQUEST message may contain the *GERAN BSC Container* IE in order to provide GERAN-specific information to GERAN (see TS 43.051 [27]).
- In case of GERAN Iu-mode (only for CS), if the BSC cannot provide an appropriate RAB corresponding to the content of the *GERAN BSC Container* IE (if received), the BSC shall report unsuccessful RAB establishment/modification indicating the cause value "GERAN Iu-mode Failure" and the *GERAN Classmark* IE in the *GERAN Iu mode specific RABs Failed To Setup Or Modify List* IE within the RAB ASSIGNMENT RESPONSE message.

8.2.3 Unsuccessful Operation

The unsuccessful operation for this Class 3 Elementary procedure is described under the Successful Operation chapter.

8.2.4 Abnormal Conditions

For a RAB requested to be modified, if only the *RAB ID* IE, the *NAS Synchronisation Indicator* IE and the *Transport Layer Information* IE are included in the *First Setup or Modify Item* IE, the RAB shall not be modified, and the corresponding *RAB ID* IE and *Cause* IE shall be included in the "RABs Failed To Setup Or Modify List" in the RAB ASSIGNMENT RESPONSE message.

If, for a RAB requested to be setup towards the PS domain, any of the following IEs:

- *PDP Type Information*.
- *PDP Type Information extension*.
- *Data Volume Reporting Indication*.

is not present, the RNC shall continue with the procedure.

Interactions with Relocation Preparation/Enhanced Relocation procedure:

If the relocation or enhanced relocation becomes necessary during the RAB Assignment procedure, the RNC may interrupt the ongoing RAB Assignment procedure and initiate the Relocation Preparation or Enhanced Relocation procedure as follows:

1. The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
 - for all queued RABs;
 - for RABs not already established or modified, and
 - for RABs not already released;
 with the cause "Relocation triggered".
2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
 - for RABs already established or modified but not yet reported to the CN, and
 - for RABs already released but not yet reported to the CN.
3. The RNC shall report the outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.

4. The RNC shall either invoke relocation by sending a RELOCATION REQUIRED message to the active CN node(s) or enhanced relocation by sending the Iur ENHANCED RELOCATION REQUEST message to the target RAN node.
5. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

Directed retry from UMTS to GSM (CS domain only):

In the case where the RNC has no RAB configuration for a particular UE in the CS domain, and the RNC receives a RAB ASSIGNMENT REQUEST message for that UE requesting the establishment of one RAB only, a directed retry to perform inter-system handover to GSM may be initiated. In this case the RNC may interrupt the ongoing RAB Assignment procedure and initiate the Relocation Preparation procedure as follows:

1. The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification of that RAB with the cause "Directed retry".
2. The RNC shall report the outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
3. The RNC shall invoke relocation by sending a RELOCATION REQUIRED message to the active CN node, with the cause "Directed Retry".
4. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

For a RAB setup or modification, if the *Supported Maximum Bit Rate* IE (respectively *Supported Guaranteed Bit Rate* IE) is present in the *RAB Parameters* IE, the RNC shall ignore the corresponding bitrate and/or extended bitrate definition in this IE.

For a RAB setup or modification, if the *Supported Alternative Maximum Bit Rate* IE (respectively *Supported Alternative Guaranteed Bit Rate* IE) is present in the *Alternative RAB Parameter Values* IE, the RNC shall ignore the corresponding alternative bitrate and/or extended alternative bitrate definitions in this IE.

For a RAB setup or modification, if both the *Correlation ID* IE and the *SIPTO Correlation ID* IE are present for the same RAB, the RNC shall consider the establishment of the corresponding RAB as failed.

8.3 RAB Release Request

8.3.1 General

The purpose of the RAB Release Request procedure is to enable the UTRAN to request the release of one or several radio access bearers. The procedure uses connection oriented signalling.

8.3.2 Successful Operation

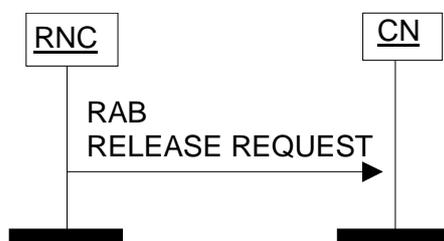


Figure 2: RAB Release Request procedure. Successful operation.

The RNC initiates the procedure by generating a RAB RELEASE REQUEST message towards the CN. The *RABs To Be Released* IE shall indicate the list of RABs requested to release and the *Cause* IE associated to each RAB shall indicate the reason for the release, e.g. "RAB pre-empted", "Release due to UTRAN Generated Reason", "Radio Connection With UE Lost".

The RNC shall indicate the *Cause* IE set to "GTP Resources Unavailable" for the reasons specified in TS 23.007 [53].

Upon reception of the RAB RELEASE REQUEST message, the CN should normally initiate the appropriate release procedure for the RABs identified in the RAB RELEASE REQUEST message as defined below. It is up to the CN to decide how to react to the request.

Interaction with Iu Release Command:

If no RABs will remain according to the RAB RELEASE REQUEST message, the CN should initiate the Iu Release procedure if it does not want to keep the Iu signalling connection. The cause value to use is "No Remaining RAB".

Interaction with RAB Assignment (release RAB):

If the CN decides to release some or all indicated RABs, the CN should invoke the RAB Assignment procedure (release RAB) to this effect.

8.3.3 Abnormal Conditions

Not applicable.

8.4 Iu Release Request

8.4.1 General

The purpose of the Iu Release Request procedure is to enable the UTRAN to request the CN to release the Iu connection for a particular UE due to some UTRAN generated reason (e.g. "O&M Intervention", "Unspecified Failure", "User Inactivity", "Repeated Integrity Checking Failure", "Release due to UE generated signalling connection release", "Radio Connection With UE Lost", "Access Restricted Due to Shared Networks"). The procedure uses connection oriented signalling.

8.4.2 Successful Operation



Figure 3: Iu Release Request procedure. Successful operation.

The RNS controlling the Iu connection(s) of that particular UE initiates the procedure by generating an IU RELEASE REQUEST message towards the affected CN domain(s). The procedure may be initiated for instance when the contact with a particular UE is lost or due to user inactivity.

The IU RELEASE REQUEST message shall indicate the appropriate cause value for the requested Iu connection release. It is up to the CN to decide how to react to the request.

Interactions with Iu Release procedure:

The Iu Release procedure should be initiated upon reception of an IU RELEASE REQUEST message when the cause is different than "User Inactivity". When the cause is set to "User Inactivity", it is optional to initiate the Iu Release procedure.

8.4.3 Abnormal Conditions

Not applicable.

8.5 Iu Release

8.5.1 General

The purpose of the Iu Release procedure is to enable the CN to release an Iu connection for a particular UE and all UTRAN resources related only to that Iu connection. The procedure uses connection oriented signalling.

The Iu Release procedure can be initiated for at least the following reasons:

- Completion of transaction between the UE and the CN.
- UTRAN-generated reasons, e.g. reception of an IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of a Relocation Resource Allocation procedure.
- Detection of two Iu connections in the same domain toward one UE.

The Iu release procedure should also be initiated when there is a period of Iu signalling inactivity with no existing RAB.

8.5.2 Successful Operation

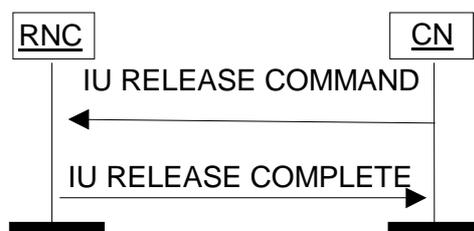


Figure 4: Iu Release procedure. Successful operation.

The CN initiates the procedure by sending an IU RELEASE COMMAND message to the UTRAN.

After the IU RELEASE COMMAND message has been sent, the CN shall not send further RANAP connection-oriented messages on this particular connection.

The IU RELEASE COMMAND message shall include a *Cause* IE indicating the reason for the release (e.g. "Successful Relocation", "Normal Release", "Release due to UTRAN Generated Reason", "Relocation Cancelled", "No Remaining RAB").

When the RNC receives the IU RELEASE COMMAND message:

1. Clearing of the related UTRAN resources is initiated. However, the UTRAN shall not clear resources related to other Iu signalling connections the UE might have. The Iu transport bearers for RABs subject to data forwarding and other UTRAN resources used for the GTP-PDU forwarding process, are released by the RNC only when the timer $T_{DATAfwd}$ expires.
2. The RNC returns any assigned Iu user plane resources to idle i.e. neither uplink user data nor downlink user data can be transferred over the Iu interface anymore. Then the RNC sends an IU RELEASE COMPLETE message to the CN. (The RNC does not need to wait for the release of UTRAN radio resources or for the transport network layer signalling to be completed before returning the IU RELEASE COMPLETE message.) When an IU RELEASE COMPLETE message is sent, the procedure is terminated in the UTRAN.

If the IU RELEASE COMMAND message included the *End Of CSFB* IE, the RNC may use the indication to determine which of the existing mechanisms that should be used to move the UE to E UTRAN.

If the IU RELEASE COMMAND message includes the *Out Of UTRAN* IE, the RNC may use the indication to determine whether to explicitly release the RRC connection.

If the IU RELEASE COMMAND message included the *Last E-UTRAN PLMN Identity* IE, the RNC may take this information into account when selecting the target cell or frequency and then act as defined in TS 23.272 [67].

In case the UE has been linked to Multicast Service(s) in UTRAN and the RNC receives the IU RELEASE COMMAND message from PS domain or from CS domain when no Iu signalling connection exists towards the other domain the RNC shall perform UE de-linking as described in TS 25.346 [42].

The IU RELEASE COMPLETE message shall include within the *RABs Data Volume Report List* IE for each RAB towards the PS domain successfully addressed and for which data volume reporting was requested during RAB establishment, the total amount of unsuccessfully transmitted DL data for the RAB since its establishment.

If the release was initiated by the UTRAN, for each RAB towards the PS domain for which the *DL GTP-PDU Sequence Number* IE and/or the *UL GTP-PDU Sequence Number* IE are (is) available, the RNC shall include the available sequence number(s) in the *RABs Released Item* IE (within the *RAB Released List* IE) in the IU RELEASE COMPLETE message.

The *RAB Release Item* IE shall not be present if there is no sequence number to be reported for that RAB.

Reception of an IU RELEASE COMPLETE message terminates the procedure in the CN.

Interaction with Trace:

In case of simultaneous Iu signalling connections for both CS and PS domains, if a trace session was activated by both domains, the successful release of one of the connections should not close this trace session. If the trace session was activated by only one domain and the Iu connection for this domain is successfully released, this trace session shall be stopped in UTRAN.

8.5.3 Abnormal Conditions

If the Iu Release procedure is not initiated towards the source RNC from the CN before the expiry of timer $T_{RELOCoverall}$, the source RNC should initiate the Iu Release Request procedure towards the CN with a cause value " $T_{RELOCoverall}$ expiry".

8.6 Relocation Preparation

8.6.1 General

The purpose of the Relocation Preparation procedure is to prepare relocation of SRNS either with involving the UE or without involving the UE. The relocation procedure shall be co-ordinated over all Iu signalling connections existing for the UE in order to allow Relocation co-ordination in the target RNC. The procedure uses connection oriented signalling.

The source RNC shall not initiate the Relocation Preparation procedure for an Iu signalling connection if a Prepared Relocation exists in the RNC for that Iu signalling connection or if a Relocation Preparation procedure is ongoing for that Iu signalling connection or in the case of a MOCN configuration if the Rerouting Function is ongoing.

8.6.2 Successful Operation

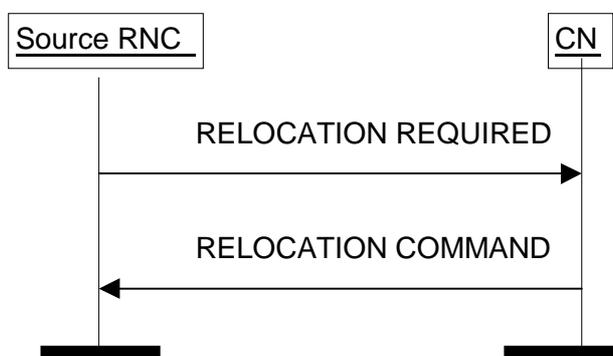


Figure 5: Relocation Preparation procedure. Successful operation.

The source RNC initiates the procedure by sending a RELOCATION REQUIRED message. The source RNC shall decide whether to initiate an intra-system Relocation or an inter-system handover.

The source RNC shall indicate the appropriate cause value for the Relocation in the *Cause* IE. Typical cause values are "Time critical Relocation", "Resource optimisation relocation", "Relocation desirable for radio reasons", "Directed Retry", "Reduce Load in Serving Cell", "Access Restricted Due to Shared Networks", "No Iu CS UP relocation".

The source RNC shall determine whether the relocation of SRNS shall be executed with or without involvement of the UE. The source RNC shall set accordingly the *Relocation Type* IE to "UE involved in relocation of SRNS" or "UE not involved in relocation of SRNS".

In case of intra-system Relocation, the source RNC:

- shall indicate in the *Source ID* IE the RNC-ID of the source RNC and in the *Target ID* IE the RNC-ID of the target RNC only including the RAC if the message is sent towards the PS domain;
- shall in case SRVCC is performed include the *SRVCC HO Indication* IE in the RELOCATION REQUIRED message. The value of *SRVCC HO Indication* IE shall be set by the source RNC. In case the source RNC decides to involve at the target side only CS domain, the *SRVCC HO Indication* IE shall be set to "CS only", to "PS and CS" in case CS and PS domain at the target side shall be involved;

NOTE: The *Number of Iu Instances* IE within the *Source RNC to Target RNC Transparent Container* IE shall be set according to the *SRVCC HO Indication* IE.

- shall include in the RELOCATION REQUIRED message the *Source to Target Transparent Container* IE. This container shall be encoded according to the *Source RNC to Target RNC Transparent Container* IE definition. The *Source RNC to Target RNC Transparent Container* IE shall include:
 - the *Relocation Type* IE and the *Number of Iu Instances* IE containing the number of Iu signalling connections existing for the UE.
 - the *Integrity Protection Key* IE from the last received domain on which the Security Mode Control procedure has been successfully performed, and the associated *Chosen Integrity Protection Algorithm* IE that has been selected for this domain.
 - the *Ciphering Key* IE for the signalling data from the last received domain on which the Security Mode Control procedure has been successfully performed if the ciphering has been started, together with the associated *Chosen Encryption Algorithm* IE that has been selected for this domain. If the ciphering has not been started, the RNC may include the *Ciphering Key* IE and the *Chosen Encryption Algorithm* IE if they are available.
 - for each domain where the Security Mode Control procedure has been successfully performed in the source RNC, the *Chosen Encryption Algorithm* IE of CS (PS respectively) user data corresponding to the ciphering alternative that has been selected for this domain. If the Security Mode Control procedure had not been successful or performed for one domain or had proposed no ciphering alternative, the *Chosen Encryption Algorithm* IE for the user data of this domain shall not be included. When both the CS and the PS user data *Chosen Encryption Algorithm* IEs are provided, they shall be the same.
 - the *RRC Container* IE. If the *Relocation Type* IE is set to "UE not involved in relocation of SRNS" and the UE is using DCH(s), DSCH(s), USCH(s), HS-DSCH and/or E-DCH, the *Source RNC to Target RNC Transparent Container* IE shall:
 - for each RAB include the RAB ID, the *CN Domain Indicator* IE and the mapping between each RAB subflow and transport channel identifier(s) over Iur, i.e. if the RAB is carried on a DCH(s), the DCH ID(s) shall be included, and when it is carried on DSCH(s), USCH(s), HS-DSCH and/or E-DCH, the DSCH ID(s), USCH ID(s), HS-DSCH MAC-d Flow ID and/or E-DCH MAC-d Flow ID respectively shall be included.
 - only in the case the active SRBs in SRNC are not all mapped onto the same DCH, include the *SRB TrCH Mapping* IE containing for each SRB the SRB ID and the associated transport channel identifier over Iur, i.e. if the SRB is carried on a DCH, the DCH ID shall be included, and when it is carried on DSCH, USCH, HS-DSCH and/or E-DCH, the DSCH ID, USCH ID, HS-DSCH MAC-d Flow ID and/or E-DCH MAC-d Flow ID respectively shall be included.
 - the *d-RNTI* IE, if the *Relocation Type* IE is set to "UE not involved in relocation of SRNS".
 - the *Target Cell ID* IE, if the *Relocation Type* IE is set to "UE involved in relocation of SRNS".

- in the *PS RAB To Be Replaced* IE the RAB ID of the voice RAB which is relocated from the PS to the CS CN domain, in case SRVCC is performed.
- the *d-RNTI for No IuCS UP* IE, if the source RNC doesn't have an Iu-CS user plane connection, the *Relocation Type* IE is set to "UE involved in relocation of SRNS" and the reason for the relocation is the source RNC cannot support CS service. The *Cause* IE shall be set as "No Iu CS UP relocation" in the RELOCATION REQUIRED message.
- the *MBMS Linking Information* IE, if available, in case the UE has been linked to at least one Multicast Service.
- the *UE History Information* IE and the source RNC shall add the stored information to the *Last Visited Cell List* IE, in case the source RNC is configured to collect UE history information.
- the *Subscriber Profile ID for RAT/Frequency priority* IE if available in the source RNC.
- the *Management Based MDT Allowed* IE only or the *Management Based MDT Allowed* IE and the *Management Based MDT PLMN List* IE, if this has been provided to the RNC and the serving PLMN of the relocation target is included in the *Management Based MDT PLMN List*.
- the *Last E-UTRAN PLMN Identity* IE if available in the source RNC.
- may in case a Trace Recording Session is active in the Source RNC due to a Signalling Based Activation (see TS 32.421 [37]), include the *Trace Recording Session Information* IE containing information identifying the Trace Record being generated in the *Source RNC to Target RNC Transparent Container* IE.

In case of inter-system handover to GSM CS domain, the RNC:

- the source RNC shall indicate in the *Source ID* IE the Service Area Identifier and in the *Target ID* IE the cell global identity of the cell in the target system;
- shall include the *MS Classmark 2* and *MS Classmark 3* IEs received from the UE in the RELOCATION REQUIRED message to the CN;
- shall include the *Old BSS to New BSS Information* IE within the RELOCATION REQUIRED message only if the information is available. This information shall include, if available, the current traffic load in the source cell, i.e. prior to the inter-system handover attempt. This information shall also include the source cell identifier the included traffic load values correspond to. In the case the UE is using, prior to the inter-system handover attempt, radio resources of more than one cell, it is implementation specific for which cell the source RNC should report the current traffic load and the cell identifier.
- shall in case SRVCC is performed include the *SRVCC HO Indication* IE in the RELOCATION REQUIRED message. The value of *SRVCC HO Indication* IE shall be set to "CS only" by the source RNC;

In case of inter-system handover to GSM PS domain, the RNC:

- shall indicate in the *Source ID* IE the Service Area Identifier, in the *Target ID* IE the cell global identity of the cell in the target system and shall also indicate routing area code for the relevant cell in the target system;
- shall include the *Source BSS to Target BSS Transparent Container* IE within the RELOCATION REQUIRED message to the CN. It may indicate in this container whether it requests to receive the SI/PSI container from the external inter-system handover target in the RELOCATION COMMAND message.

In case of inter-system handover towards the GSM CS domain and GSM PS domain in parallel, the source RNC:

- shall include in the *Target ID* IE the same cell global identity of the cell in the target system for CS domain and PS domain and set the appropriate information about the nature of the CS/PS inter-system handover (see TS 43.055 [47]) in the *Old BSS to New BSS Information* IE and *Source BSS to Target BSS Transparent Container* IE accordingly.
- shall in case SRVCC is performed include the *SRVCC HO Indication* IE in the RELOCATION REQUIRED message. The value of *SRVCC HO Indication* IE shall be set to "PS and CS" by the source RNC;

In case of inter-system handover to E-UTRAN (as specified in TS 23.401 [48]), the RNC:

- shall indicate in the *Source ID IE* the RNC-ID of the source RNC and in the *Target ID IE* either the eNB-ID or the Corresponding RNC-ID of the target eNodeB in the target system (see subclause 9.2.1.25);
- shall include the *Source to Target Transparent Container IE* within the RELOCATION REQUIRED message. The information in the container shall be encoded according to the *Source eNB to Target eNB Transparent Container IE* definition as specified in TS 36.413 [49].
- shall, in case rSRVCC is performed, include the *rSRVCC HO Indication IE* in the RELOCATION REQUIRED message. The value of *rSRVCC HO Indication IE* shall be set to "PS only" by the source RNC.

When the source RNC sends the RELOCATION REQUIRED message, it shall start the timer $T_{\text{RELOCprep}}$.

When the preparation including resource allocation in the target system is ready and the CN has decided to continue the relocation of SRNS, the CN shall send a RELOCATION COMMAND message to the source RNC and the CN shall start the timer $T_{\text{RELOCcomplete}}$.

If the *CSG Id IE* and no *Cell Access Mode IE* are received in the RELOCATION REQUIRED message, the CN shall perform the access control according to the CSG Subscription Data of that UE and if the access control is successful, or if one of the RABs has some particular ARP values (see TS 23.060 [21]), it shall continue the relocation and propagate the target *CSG Id IE* to the target side. If the access control is unsuccessful but at least one of the RABs has some particular ARP values (see TS 23.060 [21]) the CN shall also provide the *CSG Membership Status IE* set to "non-member" to the target side.

If the *CSG Id IE* and the *Cell Access Mode IE* set to "hybrid" are received in the RELOCATION REQUIRED message, the CN shall provide the *CSG Membership Status IE* of the UE and the target CSG Id to the target side.

If the *Target To Source Transparent Container IE* or the *L3 information IE* or the *Target BSS to Source BSS Transparent Container IE* is received by the CN from the relocation target, it shall be included in the RELOCATION COMMAND message.

The RELOCATION COMMAND message may also contain the *Inter-System Information Transparent Container IE*.

In case of SRVCC operation, when the target system is GERAN the RELOCATION COMMAND message shall contain the *SRVCC Information IE*.

In case of rSRVCC operation, the RELOCATION COMMAND message shall contain the *rSRVCC Information IE*.

If the *Target BSS to Source BSS Transparent Container IE* is received in the RELOCATION COMMAND message, only the value part of the UE related containers received shall be sent to the UE.

For each RAB successfully established in the target system and originating from the PS domain, the RELOCATION COMMAND message shall contain at least one pair of Iu transport address and Iu transport association to be used for the forwarding of the DL N-PDU duplicates towards the relocation target. If more than one pair of Iu transport address and Iu transport association is included, the source RNC shall select one of the pairs to be used for the forwarding of the DL N-PDU duplicates towards the relocation target. Upon reception of the RELOCATION COMMAND message from the PS domain, the source RNC shall start the timer T_{DATAfwd} .

The Relocation Preparation procedure is terminated in the CN by transmission of the RELOCATION COMMAND message.

If the target system (including target CN) does not support all existing RABs, the RELOCATION COMMAND message shall contain a list of RABs indicating all the RABs that are not supported by the target system. This list may include information on RABs from the PS domain not existing in the source RNC which shall be ignored by the source RNC. This list is contained in the *RABs to Be Released IE*. The source RNC shall use this list to avoid transferring associated contexts where applicable and may use this list e.g. to decide if to cancel the relocation or not. The resources associated with not supported RABs shall not be released until the relocation is completed. This is in order to make a return to the old configuration possible in case of a failed or cancelled relocation.

Upon reception of the RELOCATION COMMAND message the source RNC shall stop the timer $T_{\text{RELOCprep}}$, start the timer $T_{\text{RELOCoverall}}$ and terminate the Relocation Preparation procedure. The source RNC is then defined to have a Prepared Relocation for that Iu signalling connection.

When the Relocation Preparation procedure is successfully terminated and when the source RNC is ready, the source RNC should trigger the execution of relocation of SRNS.

Interactions with the SRVCC Preparation procedure:

In case of SRVCC operation, the *Source RNC to Target RNC Transparent Container* IE shall include the *Integrity Protection Key* IE, the *Ciphering Key* IE for the signalling data and the SRVCC Information as received during the SRVCC Preparation procedure.

Interactions with the rSRVCC Preparation procedure:

In case of rSRVCC operation, the RNC shall only initiate the Relocation Preparation procedure on the Iu-CS signalling connections existing for the UE.

Interactions with other procedures:

If, after a RELOCATION REQUIRED message is sent and before the Relocation Preparation procedure is terminated, the source RNC receives a RANAP message initiating another connection oriented RANAP class 1 or class 3 procedure (except IU RELEASE COMMAND message, which shall be handled normally) via the same Iu signalling connection, the source RNC shall either:

1. cancel the Relocation Preparation procedure i.e. execute the Relocation Cancel procedure with an appropriate value for the *Cause* IE, e.g. "Interaction with other procedure", and after successful completion of the Relocation Cancel procedure, the source RNC shall continue the initiated RANAP procedure;

or

2. terminate the initiated RANAP procedure without any changes in UTRAN by sending the appropriate response message with the cause value "Relocation Triggered" to the CN. The source RNC shall then continue the relocation of SRNS.

If during the Relocation Preparation procedure the source RNC receives a DIRECT TRANSFER message it shall be handled normally up to the anticipated limit according to section 14.12.4.2 TS 25.331 [10].

If during the Relocation Preparation procedure the source RNC receives connection oriented RANAP class 2 messages (with the exception of DIRECT TRANSFER message) it shall decide to either execute the procedure immediately or suspend it. In case the relocation is cancelled, the RNC shall resume any suspended procedures (if any).

After the Relocation Preparation procedure is successfully terminated, all RANAP messages (except IU RELEASE COMMAND message, which shall be handled normally) received via the same Iu signalling bearer shall be ignored by the source RNC.

8.6.2.1 Successful Operation for GERAN Iu-mode

The relocation between UTRAN and GERAN Iu-mode shall be considered in the Relocation Preparation procedure as intra-system relocation from RANAP point of view.

For GERAN Iu-mode and to support Relocation towards a GERAN BSC in Iu mode the following shall apply in addition for the successful operation of the Relocation Preparation procedure:

- In case of a Relocation to GERAN Iu-mode (only for CS), the RNC shall include, if available, the *GERAN Classmark* IE within the RELOCATION REQUIRED message in those cases where the transmission of the *GERAN Classmark IE* is required, as defined in TS 43.051 [27].

8.6.3 Unsuccessful Operation

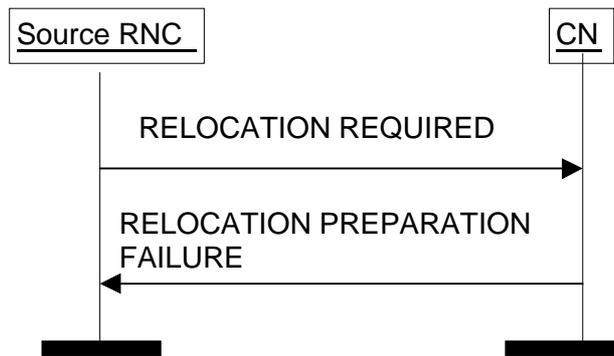


Figure 6: Relocation Preparation procedure. Unsuccessful operation.

If the CN or target system is not able to even partially accept the relocation of SRNS, or a failure occurs during the Relocation Preparation procedure in the CN, or the CN decides not to continue the relocation of SRNS, the CN shall send a RELOCATION PREPARATION FAILURE message to the source RNC.

The RELOCATION PREPARATION FAILURE message shall contain the appropriate value for the *Cause* IE, e.g. " $T_{RELOCalloc}$ expiry", "Relocation Failure in Target CN/RNC or Target System", "Relocation not supported in Target RNC or Target System", "Relocation Target not allowed", "No Radio Resources Available in Target Cell" or "Traffic Load In The Target Cell Higher Than In The Source Cell".

Transmission of the RELOCATION PREPARATION FAILURE message terminates the procedure in the CN. Reception of the RELOCATION PREPARATION FAILURE message terminates the procedure in UTRAN.

When the Relocation Preparation procedure is unsuccessfully terminated, the existing Iu signalling connection can be used normally.

If the Relocation Preparation procedure is unsuccessfully terminated, the CN shall release the possibly existing Iu signalling connection for the same UE and related to the same relocation of SRNS towards the target RNC by initiating the Iu Release procedure towards the target RNC with an appropriate value for the *Cause* IE, e.g. "Relocation Cancelled".

The RELOCATION PREPARATION FAILURE message may contain the *Inter-System Information Transparent Container* IE.

If the *CSG Id* IE and no *Cell Access Mode* IE are received in the RELOCATION REQUIRED message and the access control is unsuccessful and if none of the RABs has some particular ARP values (see TS 23.060 [21]), the CN shall send the RELOCATION PREPARATION FAILURE message with an appropriate cause value to the source RNC. Upon reception, the source RNC may decide to prevent relocation for that UE towards CSG cells with corresponding CSG Id.

Interactions with Relocation Cancel procedure:

If there is no response from the CN to the RELOCATION REQUIRED message before timer $T_{RELOCprep}$ expires in the source RNC, the source RNC shall cancel the Relocation Preparation procedure by initiating the Relocation Cancel procedure with the appropriate value for the *Cause* IE, e.g. " $T_{RELOCprep}$ expiry".

8.6.4 Abnormal Conditions

If the target RNC indicated in the RELOCATION REQUIRED message is not known to the CN:

1. The CN shall reject the relocation of SRNS by sending a RELOCATION PREPARATION FAILURE message to the source RNC with *Cause* IE set to "Unknown target RNC".
2. The CN shall continue to use the existing Iu connection towards the source RNC.

NOTE: In case two CN domains are involved in the SRNS Relocation Preparation procedure and the Source RNC receives the *Target RNC to Source RNC Transparent Container IE* via two CN domains, it may check whether the content of the two *Target RNC to Source RNC Transparent Container IE* is the same. In case the Source RNC receives two different *Target RNC to Source RNC Transparent Container IE*s, the RNC behaviour is left implementation-specific.

NOTE: In case two CN domains are involved in the SRNS Relocation Preparation procedure due to the inter-system handover towards the GSM CS domain and GSM PS domain in parallel and the Source RNC receives the *L3 Information IE* from CS domain and the *Target BSS to Source BSS Transparent Container IE* from PS domain, it may check whether the content of the *L3 Information IE* and the content of the *Target BSS to Source BSS Transparent Container IE* is the same. In case the Source RNC receives two IEs with different contents, the RNC behaviour is left implementation-specific.

8.6.5 Co-ordination of Two Iu Signalling Connections

If the RNC decides to initiate the Relocation Preparation procedure for a UTRAN to UTRAN relocation, the RNC shall initiate simultaneously a Relocation Preparation procedure on all Iu signalling connections existing for the UE. The source RNC shall also include the same *Source RNC to Target RNC Transparent Container IE*, *Relocation Type IE*, *Source ID IE* and *Cause IE* in the RELOCATION REQUIRED message towards the two domains.

For intersystem handover to GSM, the Relocation Preparation procedure shall be initiated either only towards the circuit-switched CN or only towards the packet-switched CN, if the inter-system handover towards the GSM CS domain and GSM PS domain in parallel is not supported. Otherwise the Relocation Preparation procedure shall be simultaneously initiated towards both the circuit-switched CN and the packet-switched CN.

The source RNC shall not trigger the execution of relocation of SRNS unless it has received a RELOCATION COMMAND message from all Iu signalling connections for which the Relocation Preparation procedure has been initiated, except for the case where there is at least one of the RABs that has a particular ARP value (see TS 23.060 [21]).

If the source RNC receives a RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate the Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection, except for the case where there is at least one of the RABs that has a particular ARP value (see TS 23.060 [21]) in the other domain.

8.7 Relocation Resource Allocation

8.7.1 General

The purpose of the Relocation Resource Allocation procedure is to allocate resources from a target RNS for a relocation of SRNS. The procedure shall be co-ordinated over all Iu signalling connections existing for the UE. The procedure uses connection oriented signalling.

NOTE: In case of SRVCC operation, the procedure shall be co-ordinated in the domains which the source RNC decides to involve in the SRVCC operation.

8.7.2 Successful Operation

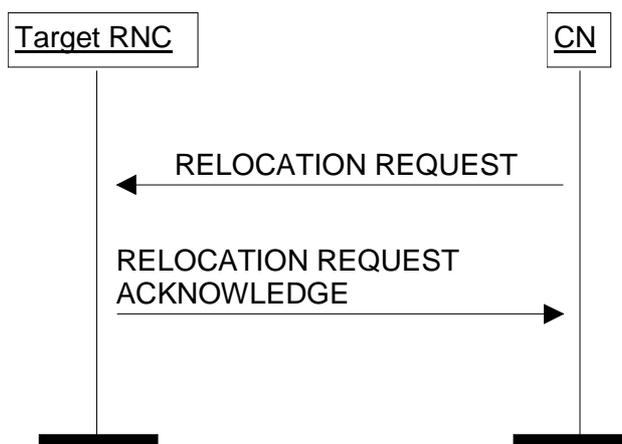


Figure 7: Relocation Resource Allocation procedure. Successful operation.

The CN initiates the procedure by generating a RELOCATION REQUEST message. In a UTRAN to UTRAN relocation, the message shall contain the information (if any) required by the UTRAN to build at least the same set of RABs as existing for the UE before the relocation, except the relocation due to SRVCC operation. The CN may indicate that RAB QoS negotiation is allowed for certain RAB parameters and in some cases also which alternative values to be used in the negotiation.

The RELOCATION REQUEST message may also include an alternative RAB configuration for a RAB specified in the *Alternative RAB configuration* IE in the *Alternative RAB Parameter Values* IE. If *Alternative RAB configuration* IE for a RAB is included in the RELOCATION REQUEST message, the target RNC is allowed after the successful relocation to request the CN to trigger the execution of this alternative RAB configuration. No negotiation is allowed during the Relocation Resource Allocation procedure between the requested RAB configuration and this alternative RAB configuration.

When the CN transmits the RELOCATION REQUEST message, it shall start the timer $T_{\text{RELOCalloc}}$.

When a RELOCATION REQUEST message is sent from a CN node towards an RNC for which the sending CN node is not the default CN node, the *Global CN-ID* IE shall be included.

Upon reception of the RELOCATION REQUEST message, the target RNC shall initiate allocation of requested resources.

The RELOCATION REQUEST message shall contain the following IEs:

- *Permanent NAS UE Identity* IE (if available);
- *Cause* IE;
- *CN Domain Indicator* IE;
- *Source RNC To Target RNC Transparent Container* IE;
- *Iu Signalling Connection Identifier* IE;
- *Integrity Protection Information* IE (if available);
- *SNA Access Information* IE (if available);
- *UESBI-Iu* IE (if available);
- *Selected PLMN identity* IE if in MOCN or GWCN configuration;
- *CN MBMS Linking Information* IE (if available);
- *UE Aggregate Maximum Bit Rate* IE (if available);
- *Anchor PLMN Identity* IE (if available).

For each RAB requested to relocate (or to be created e.g. in the case of inter-system handover), the message shall contain the following IEs:

- *RAB-ID* IE;
- *NAS Synchronisation Indicator* IE (if the relevant NAS information is provided by the CN);
- *RAB parameters* IE;
- *User Plane Information* IE;
- *Transport Layer Address* IE;
- *Iu Transport Association* IE;
- *Data Volume Reporting Indication* IE (only for PS);
- *PDP Type Information* IE (only for PS).

The RELOCATION REQUEST message may include the following IE:

- *Encryption Information* IE (shall not be included if the *Integrity Protection Information* IE is not included);
- *CSG Membership Status* IE (shall be included in cases of relocation of CSG capable UEs to hybrid cells);
- *PDP Type Information extension* IE (may be included if *PDP Type Information* IE is included).

For each RAB requested to relocate the message may include the following IEs:

- *Service Handover* IE;
- *Alternative RAB Parameter Values* IE;
- *E-UTRAN Service Handover* IE.

The following information elements received in RELOCATION REQUEST message require the same special actions in the RNC as specified for the same IEs in the RAB Assignment procedure:

- *RAB-ID* IE;
- *User plane Information* IE (i.e. required User Plane Mode and required User Plane Versions);
- *Priority level* IE, *Pre-emption Capability* IE and *Pre-emption Vulnerability* IE;
- *Service Handover* IE;
- *E-UTRAN Service Handover* IE.

The *SDU Format Information Parameter* IE in the *RAB Parameters* IE shall be present only if the *User Plane Mode* IE is set to "support mode for pre-defined SDU sizes" and the *Traffic Class* IE is set to either "Conversational" or "Streaming".

For a RAB setup, the *RAB Parameters* IE may contain the *Signalling Indication* IE. The *Signalling Indication* IE shall not be present if the *Traffic Class* IE is not set to "Interactive" or if the *CN Domain Indicator* IE is not set to "PS domain".

If the RELOCATION REQUEST message includes the Permanent NAS UE identity (i.e. IMSI), the RNC shall associate the permanent identity to the RRC Connection of that user and shall save it for the duration of the RRC connection.

If the RELOCATION REQUEST message includes the *PDP Type Information* IE or *PDP Type Information extension* IE, the UTRAN may use this IE to configure any compression algorithms.

If the *CSG Id* IE is received in the RELOCATION REQUEST message, the UTRAN shall validate it by comparing it with the CSG ID broadcast by the target cell. If it is valid and if the *CSG Membership Status* IE is received set to "member", the target RNC may apply appropriate handling to the UE.

If the *CSG Membership Status* IE and the *CSG Id* IE are received in the RELOCATION REQUEST message and the *CSG Id* does not correspond to the *CSG Id* broadcast by the target cell, the RNC may provide the QoS to the UE as for a non member and shall send back in the RELOCATION REQUEST ACKNOWLEDGE message the actual *CSG Id* broadcast by the target cell.

If the target RNC receives the *CSG Id* IE and the *CSG Membership Status* IE is set to "non-member" in the RELOCATION REQUEST message and the target cell is a CSG cell and at least one of the RABs has some particular ARP values (see TS 23.060 [21]) the RNC shall send back the RELOCATION REQUEST ACKNOWLEDGE to the CN accepting those RABs and failing the other RABs,

The *Cause* IE shall contain the same value as the one received in the related RELOCATION REQUIRED message.

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN. The value for the *Iu Signalling Connection Identifier* IE shall be allocated so as to uniquely identify an Iu signalling connection for the involved CN node. The RNC shall store and remember this identifier for the duration of the Iu connection.

The RNC shall, if supported, use the *UESBI-Iu* IE when included in the RELOCATION REQUEST message. If *UESBI-Iu* IE contains an IMEISV the RNC may use this information to determine the characteristics of the UE for subsequent handling.

If the *CN MBMS Linking Information* IE is included in the RELOCATION REQUEST message, the RNC shall, if supported, use the *CN MBMS Linking Information* IE to perform suitable UE linking as described in TS 25.346 [42].

The algorithms within the *Integrity Protection Information* IE and the *Encryption Information* IE shall be ordered in preferred order with the most preferred first in the list.

The *Permitted Encryption Algorithms* IE within the *Encryption Information* IE may contain "no encryption" within an element of its list in order to allow the RNC not to cipher the respective connection. This can be done either by not starting ciphering or by using the UEA0 algorithm. In the absence of the *Encryption Information* IE, the RNC shall not start ciphering.

The *Source To Target Transparent Container* IE is encoded as the *Source RNC To Target RNC Transparent Container* IE. The following applies for the *Source RNC To Target RNC Transparent Container* IE:

- In case of intra-system relocation, if no *Integrity Protection Key* IE (*Ciphering Key* IE respectively) is provided within the *Source RNC to Target RNC Transparent Container* IE, the target RNC shall not start integrity protection (ciphering respectively).
- In case of intra-system relocation, when an *Ciphering Key* IE is provided within the *Source RNC to Target RNC Transparent Container* IE, the target RNC may select to use a ciphering alternative where an algorithm is used. It shall in this case make use of this key to cipher its signalling data whatever the selected algorithm. The *Encryption Key* IE that is contained within the *Encryption Information* IE of the RELOCATION REQUEST message shall never be considered for ciphering of signalling data.
- In case of intra-system relocation, when an *Integrity Protection Key* IE is provided within the *Source RNC to Target RNC Transparent Container* IE, the target RNC shall select one integrity algorithm to start integrity and shall in this case make use of this key whatever the selected algorithm. The integrity protection key that is contained within the *Integrity Protection Information* IE of the RELOCATION REQUEST message shall never be considered.
- In case of intra-system relocation, when a *Trace Recording Session Information* IE is provided within the *Source RNC to Target RNC Transparent Container* IE, the Target RNC should store that information to include it in a potential future Trace Record for that UE.
- If the *Subscriber Profile ID for RAT/Frequency priority* IE is contained in the *Source RNC to Target RNC Transparent Container* IE, the target RNC shall store the received Subscriber Profile ID for RAT/Frequency priority and use it as defined in TS 36.300 [52].
- If the *CSFB Information* IE is contained in the *Source RNC to Target RNC Transparent Container* IE, the target RNC may apply special treatment.
- The RELOCATION REQUEST message may contain the *Cell Load Group Information* IE in the *Source RNC to Target RNC Transparent Container* IE.

- If the *Management Based MDT Allowed IE* only or the *Management Based MDT Allowed IE* and the *Management Based MDT PLMN List IE*, is contained in the *Source RNC to Target RNC Transparent Container IE*, the target RNC shall use it, if supported, to allow subsequent selection of the UE for management based MDT as defined in TS 32.422 [38].
- If the *Last E-UTRAN PLMN Identity IE* is contained in the *Source RNC to Target RNC Transparent Container IE*, the target RNC may store the received last E-UTRAN PLMN Identity and use it as defined in TS 23.272 [67].

In case of inter-system relocation, the integrity protection and ciphering information to be considered shall be the ones received in the *Integrity Protection Information IE* and *Encryption Information IE* of the RELOCATION REQUEST message.

The *Global CN-ID IE* contains the identity of the CN node that sent the RELOCATION REQUEST message, and it shall, if included, be stored together with the Iu signalling connection identifier. If the *Global CN-ID IE* is not included, the RELOCATION REQUEST message shall be considered as coming from the default CN node for the indicated CN domain.

The following additional actions shall be executed in the target RNC during the Relocation Resource Allocation procedure:

If included in the RELOCATION REQUEST ACKNOWLEDGE message, the *Target to Source Transparent Container IE* shall be encoded as the *Target RNC to Source RNC Transparent Container IE*.

If the *Relocation Type IE* is set to "UE involved in relocation of SRNS":

- except the relocation due to SRVCC operation, the target RNC should not accept a requested RAB if the RAB did not exist in the source RNC before the relocation. In case of SRVCC operation, the target RNC may accept CS RAB even if it did not exist in the source RNC before the relocation.
- The target RNC may accept a requested RAB only if the RAB can be supported by the target RNC.
- Other RABs shall be rejected by the target RNC in the RELOCATION REQUEST ACKNOWLEDGE message with an appropriate value in the *Cause IE*, e.g. "Unable to Establish During Relocation".
- The target RNC shall include information adapted to the resulting RAB configuration in the target to source RNC transparent container to be included in the RELOCATION REQUEST ACKNOWLEDGE message sent to the CN. If the target RNC supports triggering of the Relocation Detect procedure via the Iur interface, the RNC shall assign a d-RNTI for the context of the relocation and include it in the container. If two CNs are involved in the relocation of SRNS, the target RNC may, however, decide to send the container to only one CN.
- If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the RELOCATION REQUEST ACKNOWLEDGE message within the *Assigned RAB Parameter Values IE*.
- If *d-RNTI for No IuCS UP IE* is contained in the RELOCATION REQUEST message, the target RNC shall use this information to configure the resource for the UE over Iur during the relocation.

If the *Relocation Type IE* is set to "UE not involved in relocation of SRNS":

- The target RNC shall not accept a requested RAB if the RAB did not exist in the source RNC before the relocation.
- The target RNC may accept a RAB only if the radio bearer(s) for the RAB either exist(s) already and can be used for the RAB by the target RNC, or do(es) not exist before the relocation but can be established in order to support the RAB in the target RNC.
- If existing radio bearers are not related to any RAB that is accepted by the target RNC, the radio bearers shall be ignored during the relocation of SRNS and the radio bearers shall be released by the radio interface protocols after completion of relocation of SRNS.
- If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the RELOCATION REQUEST ACKNOWLEDGE message within the *Assigned RAB Parameter Values IE*. It should be noted that the usage of alternative RAB parameter values is not applicable to the UTRAN initiated relocation of type "UE not involved in relocation of SRNS".

If the *UE History Information* IE is included in the RELOCATION REQUEST message and the target RNC is configured to collect the information, the target RNC shall, if supported, collect information defined in the *UE History Information* IE.

After all necessary resources for accepted RABs including the initialised Iu user plane, are successfully allocated, the target RNC shall send a RELOCATION REQUEST ACKNOWLEDGE message to the CN.

For each RAB successfully setup the RNC shall include the following IEs:

- *RAB ID*
- *Transport Layer Address* (when no ALCAP has been used)
- *Iu Transport Association* (when no ALCAP has been used)

Two pairs of *Transport Layer Address* IE and *Iu Transport Association* IE may be included for RABs established towards the PS domain.

For each RAB the RNC is not able to setup during the Relocation Resource Allocation procedure, the RNC shall include the *RAB ID* IE and the *Cause* IE within the *RABs Failed To Setup* IE. The resources associated with the RABs indicated as failed to set up shall not be released in the CN until the relocation is completed. This is in order to make a return to the old configuration possible in case of a failed or cancelled relocation.

The RELOCATION REQUEST ACKNOWLEDGE message sent to the CN shall, if applicable and if not sent via the other CN domain, include the *Target RNC To Source RNC Transparent Container* IE. This container shall be transferred by the CN to the source RNC or the external relocation source while completing the Relocation Preparation procedure.

If the target RNC supports cell load-based inter-system handover, then in the case of inter-system handover, the *New BSS to Old BSS Information* IE may be included in the RELOCATION REQUEST ACKNOWLEDGE message. This information shall include, if available, the current traffic load in the target cell assuming a successful completion of the handover in progress.

In case of inter-system relocation, the RNC shall include the *Chosen Integrity Protection Algorithm* IE (*Chosen Encryption Algorithm* IE respectively) within the RELOCATION REQUEST ACKNOWLEDGE message, if, and only if the *Integrity Protection Information* IE (*Encryption Information* IE respectively) was included in the RELOCATION REQUEST message.

In case of intra-system relocation, the RNC shall include the *Chosen Integrity Protection Algorithm* IE (*Chosen Encryption Algorithm* IE respectively) within the RELOCATION REQUEST ACKNOWLEDGE message, if, and only if the *Integrity Protection Key* IE (*Ciphering Key* IE respectively) was included within the *Source RNC-to-Target RNC transparent container* IE.

If one or more of the RABs that the target RNC has decided to support cannot be supported by the CN, then these failed RABs shall not be released towards the target RNC until the relocation is completed.

If the *NAS Synchronisation Indicator* IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the UE.

If the *SNA Access Information* IE is contained in the RELOCATION REQUEST message, the target RNC shall store this information and use it to determine whether the UE has access to radio resources in the UTRAN. The target RNC shall consider that the UE is authorised to access only the PLMNs identified by the *PLMN identity* IE in the *SNA Access Information* IE. If the *Authorised SNAs* IE is included for a given PLMN (identified by the *PLMN identity* IE), then the target RNC shall consider that the access to radio resources for the concerned UE is restricted to the LAs contained in the SNAs identified by the *SNAC* IEs.

If the *SNA Access Information* IE is not contained in the RELOCATION REQUEST message, the target RNC shall consider that no access restriction applies to the UE in the UTRAN.

Transmission and reception of a RELOCATION REQUEST ACKNOWLEDGE message terminate the procedure in the UTRAN and in the CN respectively.

Before reporting the successful outcome of the Relocation Resource allocation procedure, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. If the RNC cannot initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the

rules for initialisation of the respective user plane mode versions, as described in TS 25.415 [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

If the *Selected PLMN identity* IE is contained in the RELOCATION REQUEST message, the target RNC shall use this information to send it to the UE.

If the *UE Aggregate Maximum Bit Rate* IE is included in the RELOCATION REQUEST message, the UTRAN shall, if supported, store the received UE Aggregate Maximum Bit Rate parameters to control the aggregate data rate of non-GBR traffic for this UE.

In case SIPTO at Iu-PS functionality is supported by the UTRAN, the following applies in addition for the successful operation of the Relocation Resource Allocation procedure:

- If the *MSISDN* IE is present in the RELOCATION REQUEST message, then the UTRAN may offload the RAB(s) where the *Offload RAB Parameters* IE is present in the *RABs To Be Setup Item IEs* IE. The *Access Point Name* IE and the *Charging Characteristics* IE within the *Offload RAB Parameters* IE and the *MSISDN* IE may only be used for the SIPTO at Iu-PS function and according to the description in TS 23.060 [21].

If the *Power Saving Indicator* IE is included in the RELOCATION REQUEST message the RNC shall if supported, store this information and use it when determining to send the UE back to the PSM mode if the value is "PSM Configured" or to send the UE back to the eDRX mode in Idle if the value is "eDRX Configured", as defined in TS 23.682 [68].

Interactions with Uplink Information Exchange procedure:

In case of UTRAN to UTRAN CS only relocation, if the RELOCATION REQUEST message includes the *MBMS Linking Information* IE in the *Source RNC To Target RNC Transparent Container* IE, the RNC shall, if supported, initiate the Uplink Information Exchange procedure to retrieve the Multicast Service list for the UE, create relevant MBMS Service Context, store this information and perform the relevant UE linking as defined in TS 25.346 [42].

8.7.2.1 Successful Operation for GERAN Iu-mode

The relocation between UTRAN and GERAN Iu-mode shall be considered in the Relocation Resource Allocation procedure as intra-system relocation from RANAP point of view.

For GERAN Iu-mode and to support Relocation towards a GERAN BSC in Iu mode the following shall apply in addition for the successful operation of the Relocation Resource Allocation procedure:

- In case of GERAN Iu-mode, for RAB requested to be relocated from the CS domain, the RELOCATION REQUEST message may contain the *GERAN BSC Container* IE in order to provide GERAN specific information to the target BSC (see TS 43.051 [27]).

8.7.3 Unsuccessful Operation

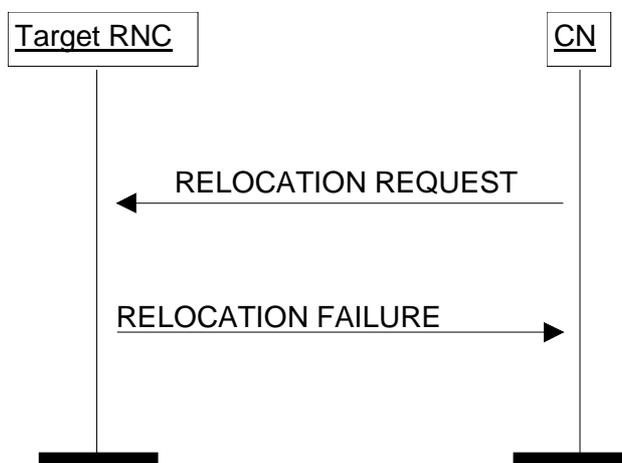


Figure 8: Relocation Resource Allocation procedure: Unsuccessful operation.

If the target RNC cannot even partially accept the relocation of SRNS or a failure occurs during the Relocation Resource Allocation procedure in the target RNC, the target RNC shall send a RELOCATION FAILURE message to the CN. The RELOCATION FAILURE message shall contain the *Cause* IE with an appropriate value.

If the target RNC cannot support any of the integrity protection (ciphering respectively) alternatives provided in the *Integrity Protection Information* IE or *Encryption Information* IE, it shall return a RELOCATION FAILURE message with the cause "Requested Ciphering and/or Integrity Protection algorithms not supported".

If the target RNC cannot support the relocation due to PUESBINE feature, it shall return a RELOCATION FAILURE message with the cause "Incoming Relocation Not Supported Due To PUESBINE Feature".

If the target RNC does not receive the *CSG Membership Status* IE but does receive the *CSG Id* IE in the RELOCATION REQUEST message and the *CSG Id* IE is not valid, it shall send the RELOCATION FAILURE message to the CN with an appropriate cause value.

If the *CSG Id* IE is not received in the RELOCATION REQUEST message and the access control for the relocation to a CSG cell is unsuccessful and if none of the RABs has some particular ARP values (see TS 23.060 [21]), the target RNC shall return a RELOCATION FAILURE message with an appropriate cause value, e.g. "Relocation Target not allowed".

Transmission and reception of a RELOCATION FAILURE message terminate the procedure in the UTRAN and in the CN respectively.

When the CN receives a RELOCATION FAILURE message from the target RNC, it shall stop timer $T_{\text{RELOCalloc}}$ and shall assume possibly allocated resources within the target RNC completely released.

In case of inter-system handover, and if the target RNC supports cell load-based inter-system handover, then

- the *NewBSS to Old BSS Information* IE may be included in the RELOCATION FAILURE message. This information shall include, if available, the current traffic load in the target cell.
- the RELOCATION FAILURE message shall contain the *Cause* IE with an appropriate value, e.g. "No Radio Resources Available in Target Cell" or "Traffic Load In The Target Cell Higher Than In The Source Cell".
- If the *Cause* IE received in the RELOCATION REQUEST message contains the value "Reduce Load in Serving Cell" and the load in the target cell is greater than in the source cell then, if the target cell is not in a congested or blocked state, the RNC shall return a RELOCATION FAILURE message which may include the cause "Traffic Load In The Target Cell Higher Than In The Source Cell".
- When the RNC returns a RELOCATION FAILURE message with the cause "Traffic Load In The Target Cell Higher Than In The Source Cell", it shall also include the *NewBSS to Old BSS Information* IE. This information shall include the current traffic load in the target cell.

8.7.3.1 Unsuccessful Operation for GERAN Iu-mode

For GERAN Iu-mode and to support Relocation towards a GERAN BSC in Iu mode the following shall apply in addition for the unsuccessful operation of the Relocation Resource Allocation procedure:

- In case a Relocation to GERAN Iu-mode fails (only for CS), because the Target BSC cannot provide an appropriate RAB corresponding to the content of the *GERAN BSC Container* IE (if received), the Target BSC shall report the unsuccessful Relocation Resource Allocation by indicating the cause value "GERAN Iu-mode Failure" within the RELOCATION FAILURE message and shall include the *GERAN Classmark* IE.

8.7.4 Abnormal Conditions

If after reception of the RELOCATION REQUEST message, the target RNC receives another RELOCATION REQUEST message on the same Iu connection, then the target RNC shall discard the latter message and the original Relocation Resource Allocation procedure shall continue normally.

If the target RNC receives a *Source RNC to Target RNC Transparent Container* IE containing *Chosen Integrity Protection (Encryption respectively) Algorithm* IE without *Integrity Protection (Ciphering respectively) Key* IE, it shall return a RELOCATION FAILURE message with the cause "Conflict with already existing Integrity protection and/or Ciphering information".

Interactions with Iu Release procedure:

If the CN decides to not continue the Relocation Resource Allocation procedure (e.g. due to $T_{\text{RELOCalloc}}$ expiry) before the Relocation Resource Allocation procedure is completed, the CN shall stop timer $T_{\text{RELOCalloc}}$ (if timer $T_{\text{RELOCalloc}}$ has not already expired) and the CN shall, if the Iu signalling connection has been established or later becomes established, initiate the Iu Release procedure towards the target RNC with an appropriate value for the *Cause IE*, e.g. "Relocation Cancelled".

NOTE: In case two CN domains are involved in the Relocation Resource Allocation procedure, the target RNC may check whether the content of the two *Source RNC to Target RNC Transparent Container IEs* or the two *SNA Access Information IEs* is the same. In case the target RNC receives two different *Source RNC to Target RNC Transparent Container IEs* or two different *SNA Access Information IEs*, the RNC behaviour is left implementation specific.

8.7.5 Co-ordination of Two Iu Signalling Connections

Co-ordination of two Iu signalling connections during Relocation Resource Allocation procedure shall be executed by the target RNC when the *Number of Iu Instances IE* received in the *Source RNC to Target RNC Transparent Container IE* in the RELOCATION REQUEST message indicates that two CN domains are involved in relocation of SRNS.

When both the CS and PS user data *Chosen Encryption Algorithm IE* are received within the *Source RNC to Target RNC Transparent Container IE* and if these two received *Chosen Encryption Algorithm IE* are not the same, the target RNC shall fail the Relocation Resource Allocation procedure by sending back a RELOCATION FAILURE message.

The integrity protection (ciphering respectively) alternatives provided in the *Integrity Protection Information IE* (*Encryption Information IE* respectively) of the RELOCATION REQUEST messages received from both CN domains shall have at least one common alternative, otherwise the Relocation Resource Allocation shall be failed by sending back a RELOCATION FAILURE message.

If two CN domains are involved, the following actions shall be taken by the target RNC:

- The target RNC shall utilise the *Permanent NAS UE Identity IE*, received explicitly from each CN domain within the RELOCATION REQUEST messages, to co-ordinate both Iu signalling connections.
- The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE messages only after all expected RELOCATION REQUEST messages are received and analysed, except for the case where there is at least one of the RABs that has a particular ARP value (see TS 23.060 [21]).
- In case the SRVCC operation is performed and the source system is E-UTRAN, the target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE message to the CN in CS domain if the relocation of SRNS is accepted for the CS domain but not accepted for the PS domain.
- If the relocation is to a target CSG cell where the UE is a non-member of the target CSG, and where there is at least one of the RABs that has a particular ARP value (see TS 23.060 [21]) in one domain, the target RNC shall accept those RABs with a particular ARP value (see TS 23.060 [21]) and fail the other RABs, and send RELOCATION REQUEST ACKNOWLEDGE messages without waiting for the RELOCATION REQUEST message in the other domain.
- If the target RNC decides to send the *Target RNC to Source RNC Transparent Container IE* via the two CN domains, the target RNC shall ensure that the same *Target RNC to Source RNC Transparent Container IE* is included in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via the two CN domains and related to the same relocation of SRNS.

If the target RNC receives the *UESBI-Iu IE* on the Iu-CS but not on the Iu-PS interface (or vice versa), the RNC shall, if supported, use the *UESBI-Iu IE* for both domains.

8.8 Relocation Detect

8.8.1 General

The purpose of the Relocation Detect procedure is to indicate to the CN the detection by the RNC of an SRNS relocation execution. The procedure shall be co-ordinated over all Iu signalling connections existing for the UE. The procedure uses connection-oriented signalling.

8.8.2 Successful Operation

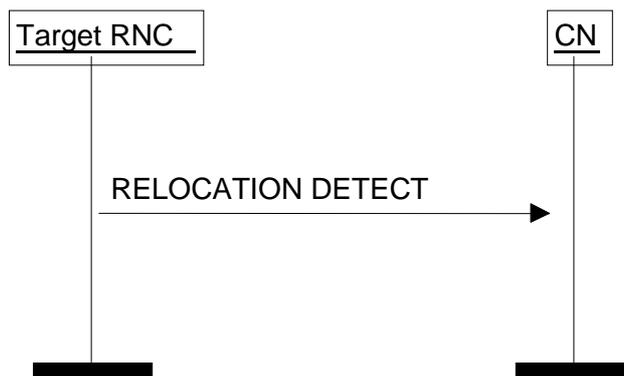


Figure 9: Relocation Detect procedure: Successful operation.

The target RNC shall send a RELOCATION DETECT message to the CN when a relocation execution trigger is received.

If the type of relocation of SRNS is "UE involved in relocation of SRNS", the relocation execution trigger may be received either from the Uu interface or as an implementation option from the Iur interface. If the type of relocation of SRNS is "UE not involved in relocation of SRNS", the relocation execution trigger is received from the Iur interface.

When the RELOCATION DETECT message is sent, the target RNC shall start SRNC operation.

Upon reception of the RELOCATION DETECT message, the CN may switch the user plane from the source RNC to the target RNC.

8.8.3 Abnormal Conditions

Interactions with Relocation Complete procedure:

If the RELOCATION COMPLETE message is received by the CN before the reception of the RELOCATION DETECT message, the CN shall handle the RELOCATION COMPLETE message normally.

8.8.4 Co-ordination of Two Iu Signalling Connections

When the Relocation Detect procedure is to be initiated by the target RNC, the target RNC shall initiate the Relocation Detect procedure on all Iu signalling connections existing for the UE between the target RNC and the CN.

8.9 Relocation Complete

8.9.1 General

The purpose of the Relocation Complete procedure is to indicate to the CN the completion by the target RNC of the relocation of SRNS. The procedure shall be co-ordinated over all Iu signalling connections existing for the UE. The procedure uses connection-oriented signalling.

8.9.2 Successful Operation



Figure 10: Relocation Complete procedure. Successful operation.

When the new SRNC-ID and serving RNC Radio Network Temporary Identity are successfully exchanged with the UE by the radio protocols, the target RNC shall initiate the Relocation Complete procedure by sending a RELOCATION COMPLETE message to the CN. Upon reception of the RELOCATION COMPLETE message, the CN should stop the $T_{\text{RELOCcomplete}}$ timer.

If the *Higher bitrates than 16 Mbps flag* IE is included in the RELOCATION COMPLETE message then the CN shall, if supported, use the IE as described in TS 23.060 [21].

If the *Tunnel Information for BBF* IE is received in the RELOCATION COMPLETE message, the CN shall, if supported, use the IE as described in TS 23.139 [65].

If the *LHN ID* IE is included in the RELOCATION COMPLETE message, the CN shall, if supported, use it as specified in TS 23.060 [21].

8.9.3 Abnormal Conditions

If the timer $T_{\text{RELOCcomplete}}$ expires:

- The CN should initiate release of Iu connections towards the source and the target RNC by initiating the Iu Release procedure with an appropriate value for the *Cause* IE, e.g. " $T_{\text{RELOCcomplete}}$ expiry".

Interactions with the Relocation Detect procedure:

If the RELOCATION DETECT message is not received by the CN before reception of the RELOCATION COMPLETE message, the CN shall handle the RELOCATION COMPLETE message normally.

8.9.4 Co-ordination of Two Iu Signalling Connections

When the Relocation Complete procedure is to be initiated by the target RNC, the target RNC shall initiate the Relocation Complete procedure on all Iu signalling connections existing for the UE between the target RNC and the CN.

8.10 Relocation Cancel

8.10.1 General

The purpose of the Relocation Cancel procedure is to enable a source RNC to cancel an ongoing relocation of SRNS. The Relocation Cancel procedure may be initiated by the source RNC during and after the Relocation Preparation procedure if either of the following conditions is fulfilled:

1. The source RNC has not yet initiated the execution of relocation of SRNS, neither via the Iur interface nor via the Uu interface.
2. After having initiated the execution of relocation of SRNS, the UE has returned to the source RNC by transmitting an RRC message which indicates that the UE considers the source RNC as its serving RNC.

The procedure shall be co-ordinated in all Iu signalling connections for which the Relocation Preparation procedure has been initiated. The procedure uses connection oriented signalling.

8.10.2 Successful Operation

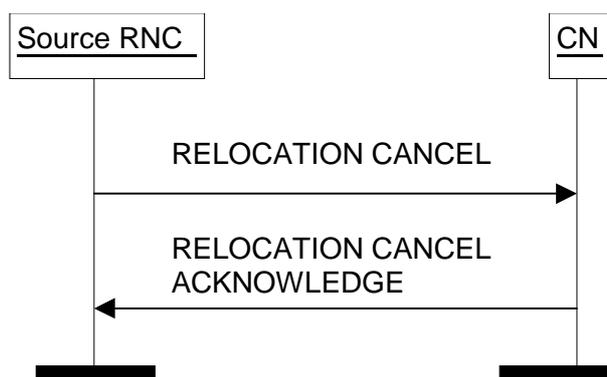


Figure 11: Relocation Cancel procedure. Successful operation.

The RNC initiates the procedure by sending a RELOCATION CANCEL message to the CN. This message shall indicate the reason for cancelling the relocation of SRNS by the appropriate value of the *Cause* IE. Upon reception of a RELOCATION CANCEL message, the CN shall send a RELOCATION CANCEL ACKNOWLEDGE message to the source RNC.

Transmission and reception of a RELOCATION CANCEL ACKNOWLEDGE message terminate the procedure in the CN and in the source RNC respectively. After this, the source RNC does not have a prepared relocation for that Iu signalling connection.

Interactions with Relocation Preparation procedure:

Upon reception of a RELOCATION CANCEL message from the source RNC, the CN shall locally terminate the possibly ongoing Relocation Preparation procedure towards that RNC and abandon the relocation of SRNS.

If the source RNC receives a RELOCATION COMMAND message from the CN after the Relocation Cancel procedure is initiated, the source RNC shall ignore the received RELOCATION COMMAND message.

If the source RNC receives a RELOCATION PREPARATION FAILURE message from the CN after the Relocation Cancel procedure is initiated, then the source RNC shall terminate the ongoing Relocation Cancel procedure.

8.10.3 Unsuccessful Operation

Not applicable.

8.10.4 Abnormal Conditions

Not applicable.

8.10.5 Co-ordination of Two Iu Signalling Connections

If the Relocation Cancel procedure is to be initiated due to other reasons than reception of a RELOCATION PREPARATION FAILURE message, the Relocation Cancel procedure shall be initiated on all Iu signalling connections existing for the UE in which the Relocation Preparation procedure has not terminated unsuccessfully.

8.11 SRNS Context Transfer

8.11.1 General

The purpose of the SRNS Context Transfer procedure is to trigger the transfer of SRNS contexts from the source RNC to the CN (PS domain) in case of intersystem change or in some further cases described in TS 23.060 [21]. The procedure uses connection oriented signalling.

8.11.2 Successful Operation

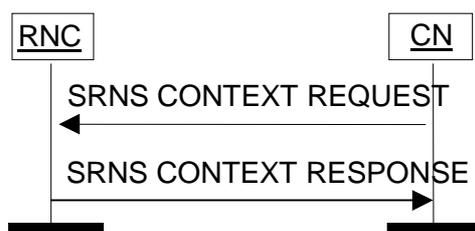


Figure 12: SRNS Context Transfer procedure. Successful operation.

The CN initiates the procedure by sending an SRNS CONTEXT REQUEST message to the source RNC. The SRNS CONTEXT REQUEST message shall include the list of RABs whose contexts should be transferred, and may include the *RAT Type* IE, when available to indicate the RAT from which the context request originates.

The source RNC shall respond to the CN with an SRNS CONTEXT RESPONSE message containing all the referenced RABs, including both successful and unsuccessful RABs transfers. For each RAB whose transfer is successful, the following context information elements shall be included:

- *RAB ID* IE;
- always when available, the sequence number for the next downlink GTP-PDU to be sent to the UE, i.e. the *DL GTP-PDU Sequence Number* IE;
- always when available, the sequence number for the next uplink GTP-PDU to be tunnelled to the GGSN, i.e. the *UL GTP-PDU Sequence Number* IE;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next downlink N-PDU (PDCP SDU) that would have been sent to the UE by a source system, i.e. the *DL N-PDU Sequence Number* IE;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next uplink N-PDU (PDCP SDU) that would have been expected from the UE by a source system, i.e. the *UL N-PDU Sequence Number* IE.

Transmission and reception of the SRNS CONTEXT RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.

8.11.3 Unsuccessful Operation

For each RAB for which the UTRAN is not able to transfer the RAB context, e.g. if the RAB ID is unknown to the RNC, the RAB ID is included in the SRNS CONTEXT RESPONSE message together with a *Cause* IE, e.g. "Invalid RAB ID".

8.11.4 Abnormal Conditions

Not applicable.

8.12 SRNS Data Forwarding Initiation

8.12.1 General

The purpose of the SRNS Data Forwarding procedure is to trigger the transfer of N-PDUs from the RNC to the CN (PS domain) in case of intersystem change or in some further cases described in TS 23.060 [21]. The procedure uses connection oriented signalling.

8.12.2 Successful Operation



Figure 13: SRNS Data Forwarding Initiation procedure. Successful operation.

The CN initiates the procedure by sending an SRNS DATA FORWARD COMMAND message to the UTRAN. The SRNS DATA FORWARD COMMAND message includes the list of RABs towards the PS domain whose data should be forwarded, and the necessary information for establishing a GTP tunnel to be used for data forwarding. For each indicated RAB, the list shall include the *RAB ID IE*, the *Transport Layer Address IE* and the *Iu Transport Association IE*.

Upon reception of the SRNS DATA FORWARD COMMAND message the RNC starts the timer $T_{DATAfwd}$.

8.12.3 Abnormal Conditions

Not applicable.

8.13 SRNS Context Forwarding from Source RNC to CN

8.13.1 General

The purpose of this procedure is to transfer SRNS contexts from the source RNC to the CN (PS domain) in case of handover via the CN. The procedure uses connection oriented signalling. SRNS contexts are sent for each concerned RAB among those that are supported by the target system, and for which at least either GTP-PDU or PDCP sequence numbering is available. The SRNS contexts contain the sequence numbers of the next GTP-PDUs to be transmitted in the uplink and downlink directions, if available, and the next PDCP sequence numbers that would have been used to send and receive data from the UE, if available. The Source RNC PDCP context info shall be sent if available.

8.13.2 Successful Operation

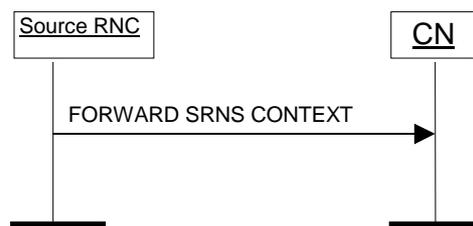


Figure 14: SRNS Context forwarding from source RNC to CN. Successful operation.

The source RNC initialises the procedure by sending a FORWARD SRNS CONTEXT message to the CN. The FORWARD SRNS CONTEXT message contains the RAB Context information for each referenced RAB. For each RAB the following information shall be included:

- *RAB ID IE*;
- always when available, the sequence number for the next downlink GTP-PDU to be sent to the UE, i.e. the *DL GTP-PDU Sequence Number IE*;

- always when available, the sequence number for the next uplink GTP-PDU to be tunnelled to the GGSN, i.e. the *UL GTP-PDU Sequence Number IE*;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next uplink N-PDU (PDCP SDU) that would have been expected from the UE by a source system i.e. the *UL N-PDU Sequence Number IE*;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next downlink N-PDU (PDCP SDU) that would have been sent to the UE by a source system i.e. the *DL N-PDU Sequence Number IE*.

8.13.3 Abnormal Conditions

Not applicable.

8.14 SRNS Context Forwarding to Target RNC from CN

8.14.1 General

The purpose of this procedure is to transfer SRNS contexts from the CN (PS domain) to the target RNC in case of handover via the CN. The procedure uses connection oriented signalling. SRNS contexts are sent for each referenced RAB, for which at least either GTP-PDU or PDCP sequence numbering is available. The SRNS contexts contain the sequence numbers of the next GTP-PDUs to be transmitted in the uplink and downlink directions, if available, and the next PDCP sequence numbers that would have been used to send and receive data from the UE, if available. The source RNC PDCP context info shall be sent if available.

8.14.2 Successful Operation

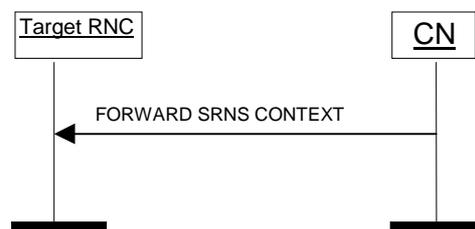


Figure 15: SRNS Context forwarding to target RNC from CN. Successful operation.

The CN initialises the procedure by sending FORWARD SRNS CONTEXT message to the target RNC. The FORWARD SRNS CONTEXT message contains the RAB Context information for each referenced RAB. For each RAB the following information shall be included:

- *RAB ID IE*;
- always when available, the sequence number for the next downlink GTP-PDU to be sent to the UE, i.e. the *DL GTP-PDU Sequence Number IE*;
- always when available, the sequence number for the next uplink GTP-PDU to be tunnelled to the GGSN, i.e. the *UL GTP-PDU Sequence Number IE*;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next uplink N-PDU (PDCP SDU) that would have been expected from the UE by a source system i.e. the *UL N-PDU Sequence Number IE*;
- always when available, the radio interface sequence number (PDCP) TS 25.323 [17] of the next downlink N-PDU (PDCP SDU) that would have been sent to the UE by a source system i.e. the *DL N-PDU Sequence Number IE*.

8.14.3 Abnormal Conditions

Not applicable.

8.15 Paging

8.15.1 General

The purpose of the Paging procedure is to enable the CN to request the UTRAN to contact that UE. The procedure uses connectionless signalling.

8.15.2 Successful Operation

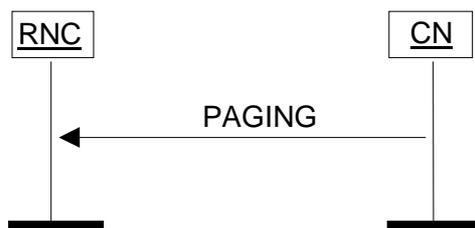


Figure 16: Paging procedure. Successful operation.

The CN initiates the procedure by sending a PAGING message. The PAGING message shall contain the following IEs:

- *CN Domain Indicator*
- *Permanent NAS UE Identity*
- *DRX Cycle Length Coefficient* (if available)

The PAGING message may contain following IEs:

- *Temporary UE Identity*
- *Paging Area*
- *Paging Cause*
- *Non Searching Indication*
- *Global CN-ID*
- *CSG Id List*

The *CN Domain Indicator* IE shall be used by the RNC to identify from which CN domain the paging request originates.

The *Permanent NAS UE Identity* IE (i.e. IMSI) shall be used by the UTRAN paging co-ordination function to check if a signalling connection towards the other CN domain already exists for this UE. In that case, the radio interface paging message shall be sent via that connection instead of using the paging broadcast channel.

The *Temporary UE Identity* IE (e.g. TMSI) is the temporary identity of the user (allocated by that CN Domain) which can be used in a radio interface paging message. If the *Temporary UE Identity* IE is not included in the PAGING message, the RNC shall use the *Permanent NAS UE Identity* instead – if no signalling connection exists.

If NNSF is active, and the *Temporary UE Identity* IE is not included in the PAGING message, the PAGING message shall include the *Global CN-ID* IE and, in case this PAGING message is originated from the CS domain, the RNC may start the T_{NNSF} timer and store the *Permanent NAS UE Identity* IE along with the related *Global CN-ID* IE until the T_{NNSF} timer has expired.

The *Paging Area* IE shall be used by the RNC to identify the area in which the radio interface paging message shall be broadcast in case no signalling connection, as described above, already exists for the UE. If the *Paging Area* IE is not included in the PAGING message, the whole RNC area shall be used as Paging Area – if no signalling connection exists for that UE.

The *Paging Cause* IE shall indicate to the RNC the reason for sending the PAGING message. The paging cause is transferred transparently to the UE.

The *Non Searching Indication* IE shall, if present, be used by the RNC to decide whether the UTRAN paging co-ordination function needs to be activated or not. In the absence of this IE, UTRAN paging co-ordination shall be performed.

The *DRX Cycle Length Coefficient* IE may be included in the PAGING message, and if present, the UTRAN shall, when applicable, use it for calculating the paging occasions for the UE.

A list of CSG IDs may be included in the PAGING message. If included, the UTRAN may use the list of CSG IDs to avoid paging the UE at CSG cells whose CSG ID does not appear in the list.

It should be noted that each PAGING message on the Iu interface relates to only one UE and therefore the RNC has to pack the pages into the relevant radio interface paging message.

The core network is responsible for the paging repetition over the Iu interface.

8.15.3 Abnormal Conditions

Not applicable.

8.16 Common ID

8.16.1 General

The purpose of the Common ID procedure is to inform the RNC about the permanent NAS UE Identity (i.e. IMSI) of a user. This is used by the RNC e.g. to create a reference between the permanent NAS UE identity of the user and the RRC connection of that user for UTRAN paging co-ordination. The procedure may also be used to provide the *SNA Access Information* IE to the RNC or to provide the *Management Based MDT Allowed* IE to the RNC or to provide the *Management Based MDT PLMN List* IE to the RNC.

The procedure uses connection oriented signalling.

8.16.2 Successful Operation



Figure 17: Common ID procedure. Successful operation.

After having established an Iu signalling connection, and if the Permanent NAS UE identity (i.e. IMSI) is available, the CN shall send to the RNC a COMMON ID message containing the *Permanent NAS UE Identity* IE and optionally the *SNA Access Information* IE. The COMMON ID message may also include the *UESBI-Iu* IE. The RNC shall associate the permanent identity to the RRC Connection of that user and shall save it for the duration of the RRC connection.

The RNC shall, if supported, use the *UESBI-Iu* IE when received in the COMMON ID message. If *UESBI-Iu* IE contains an IMEISV the RNC may use this information to determine the characteristics of the UE for subsequent handling.

If the *CSG Membership Status* IE is included in the COMMON ID message the RAN shall, if supported, take the following actions:

- If the cell that serves the UE is a Hybrid cell, the RNC shall store the value contained in the *CSG Membership Status* IE and replace any previously stored membership status value by this new one. The RNC may use such information to perform differentiated treatment for member and non-member UEs.
- If the cell that serves the UE is a CSG cell, and the *CSG Membership Status* IE is set to 'non-member', the RNC should initiate actions to ensure that the UE is no longer served by the CSG cell as defined in TS 25.467 [55].

If the *SNA Access Information* IE is contained in the COMMON ID message, the RNC shall store this information and use it to determine whether the UE has access to radio resources in the UTRAN. The RNC shall consider that the UE is authorised to access only the PLMNs identified by the *PLMN identity* IEs in the *SNA Access Information* IE. If the *Authorised SNAs* IE is included for a given PLMN (identified by the *PLMN identity* IE), then the RNC shall consider that the access to radio resources for the concerned UE is restricted to the LAs contained in the SNAs identified by the *SNAC* IEs.

If the *Power Saving Indicator* IE is contained in the COMMON ID message and the RNC shall if supported, store this information and use when determining to send the UE back to the PSM mode if the value is "PSM Configured" or to send the UE back to the eDRX mode in Idle if the value is "eDRX Configured", as defined in TS 23.682 [68].

In case of GWCN configuration for a network sharing non-supporting UE, the COMMON ID message shall include, if available, the *Selected PLMN identity* IE. If received, the RNC shall store this information.

In case SRVCC functionality is supported by the UE and CN, the CN shall include *SRVCC Operation Possible* IE in COMMON ID message.

In case rSRVCC functionality is supported by the UE and CN, the CN shall include *rSRVCC Operation Possible* IE in COMMON ID message.

If the *Management Based MDT Allowed* IE is included in the COMMON ID message, the RNC shall use it, if supported, together with information in the *Management Based MDT PLMN List* IE, if available, to allow subsequent selection of the UE for management based MDT as defined in TS 32.422 [38].

Upon receipt of the COMMON ID message the RNC shall

- store the Subscriber Profile ID for RAT/Frequency priority IE and use it as defined in TS 36.300 [52].

Upon receipt of the COMMON ID message the RNC may

- store the *Last E-UTRAN PLMN Identity* IE and use it as defined in TS 23.272 [67].

8.16.3 Abnormal Conditions

Not applicable.

8.17 CN Invoke Trace

8.17.1 General

When used for signalling based activation, the purpose of the CN Invoke Trace procedure is to inform the RNC that it should begin a trace session with the parameters indicated by the CN and related to the UE, the Iu connection is used for.

When used for management based activation, the purpose of the CN Invoke Trace procedure is to provide the RNC with the equipment identity of the UE for which the RNC should begin a trace recording session.

The procedure uses connection oriented signalling.

8.17.2 Successful Operation



Figure 18: CN Invoke Trace procedure. Successful operation.

The CN Invoke Trace procedure is invoked by the CN by sending a CN INVOKE TRACE message to the RNC as defined in TS 32.422 [38].

The CN INVOKE TRACE message shall include the following IEs:

- The *Trace Reference* IE, which uniquely identifies the trace session it refers to.
- The *UE Identity* IE, which indicates the UE to which this trace session pertains.
- The *Trace Propagation Parameters* IE, only in case of a signalling based activation.

If present, the *Trace Propagation Parameters* IE shall include the following IEs:

- The *Trace Recording Session Reference* IE, which is allocated by the CN.
- The *Trace Depth* IE, which defines how detailed information should be recorded for this trace session in the RNC.

The *Trace Propagation Parameters* IE may also include the *List Of Interfaces To Trace* IE, which defines which interfaces should be traced in the RNC. If the *List Of Interfaces To Trace* IE is not included, the RNC should trace all the following interfaces, if available: Iu-CS, Iu-PS, Uu, Iur and Iub.

Upon receiving the CN INVOKE TRACE message, which includes the *Trace Propagation Parameters* IE, the RNC should begin a trace recording session according to the parameters indicated in the CN INVOKE TRACE message. If the RNC does not support the requested value "Minimum" or "Medium" of the *Trace Depth* IE, the RNC should begin a trace recording session with maximum trace depth.

Upon receiving the CN INVOKE TRACE message, which does not include the *Trace Propagation Parameters* IE, the RNC should begin a trace recording session according to the parameters configured in the RNC for the indicated equipment identity in the CN INVOKE TRACE message.

The RNC may not start a trace recording session if there are insufficient resources available within the RNC.

The *Trace Reference* IE, *UE identity* IE and, if the *Trace Propagation Parameters* IE is present, the *Trace Recording Session Reference* IE are used to tag the trace record to allow simpler construction of the total record by the entity which combines trace records.

If the *MDT Configuration* IE is included in the CN INVOKE TRACE message and includes the *MDT Activation* IE set to 'Immediate MDT and Trace' then the RNC shall, if supported, initiate the requested trace function and MDT function as described in TS 32.422 [38].

If the *MDT Configuration* IE is included in the CN INVOKE TRACE message and includes the *MDT Activation* IE set to 'Immediate MDT Only' or 'Logged MDT only', then the RNC shall, if supported, initiate the requested MDT function as described in TS 32.422 [38] and shall ignore the *List of Interfaces to Trace* IE and the *Trace Depth* IE.

If *Trace Collection Entity IP Address* IE is included and if the *MDT Configuration* IE is also included then the RNC shall, if supported, store the Trace Collection Entity IP address and use it when transferring Trace records, otherwise if *MDT Configuration* IE is not included, the RNC may use the Trace Collection Entity IP address when transferring trace records.

If the *MDT Configuration* IE is included in the CN INVOKE TRACE message and includes the *Signalling based MDT PLMN List* IE, then the RNC may use it to propagate the trace function as described in TS 37.320 [64].

Interaction with Relocation and Enhanced Relocation:

In case of signalling based activation, the order to perform tracing is lost in UTRAN at successful Relocation of SRNS. If the tracing shall continue also after the relocation has been performed, the CN Invoke Trace procedure shall thus be re-initiated from the CN towards the future SRNC after the Relocation Resource Allocation or the Enhanced Relocation procedure has been executed successfully.

8.17.2.1 Successful Operation for GERAN Iu mode

The CN INVOKE TRACE message shall include the *Trace Type* IE to indicate the events and parameters to be recorded.

The message shall include a *Trace Reference* IE which is allocated by the entity which triggered the trace.

The message may include the *OMC ID* IE, which if present, indicates the OMC to which the record is destined.

The message may include the *UE Identity* IE, which if present, indicates the UE to which this record pertains to.

The message may include the *Trigger ID* IE, which if present, indicates the entity which triggered the trace.

The *Trace Reference* and *Trigger ID* IEs are used to tag the trace record to allow simpler construction of the total record by the entity which combines trace records.

8.17.3 Abnormal Conditions

If the *MDT Configuration* IE is included in the CN INVOKE TRACE message and the *Trace Collection Entity IP Address* IE is not included, the RNC shall ignore the MDT Configuration.

8.17.3.1 Abnormal Conditions for GERAN Iu mode

Not applicable.

8.18 Security Mode Control

8.18.1 General

The purpose of the Security Mode Control procedure is to pass ciphering and integrity mode information to the UTRAN. The UTRAN uses this information to select and load the encryption device for user and signalling data with the appropriate parameters, and also to store the appropriate parameters for the integrity algorithm. The procedure uses connection oriented signalling.

8.18.2 Successful Operation

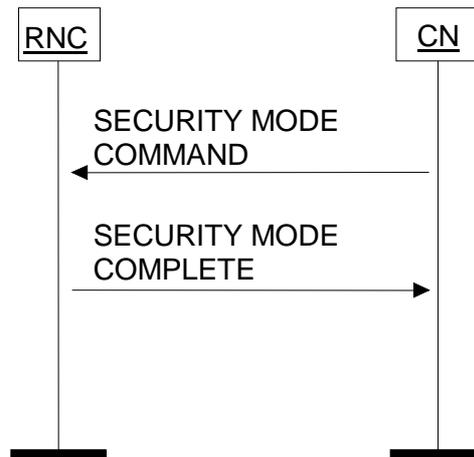


Figure 19: Security Mode Control procedure. Successful operation.

The CN initiates the procedure by sending a SECURITY MODE COMMAND message. The message may contain the *Encryption Information IE* and shall contain the *Integrity Protection Information IE*, specifying, in preferred order with the most preferred first in the list, which ciphering, if any, and integrity protection algorithms may be used by the UTRAN.

The *Permitted Encryption Algorithms IE* within the *Encryption Information IE* may contain "no encryption" within an element of its list in order to allow the RNC not to cipher the respective connection. This can be done either by not starting ciphering or by using the UEA0 algorithm. In the absence of the *Encryption Information group IE* in SECURITY MODE COMMAND message, the RNC shall not start ciphering.

Upon reception of the SECURITY MODE COMMAND message, the UTRAN shall internally select appropriate algorithms, taking into account the UE/UTRAN capabilities. If a signalling connection already exists towards the other core network domain and integrity has been started, the same ciphering and integrity alternatives as being used for that core network domain shall be selected. If a signalling connection already exists towards the other core network domain and the Security Mode Control procedure is ongoing on that core network domain, the same ciphering and integrity alternative shall be selected for the two domains. This means in particular for encryption that if "no encryption" or no *Encryption Information IE* has been received from the first core network domain and integrity has been started but ciphering has not been started, ciphering shall also not be started for the second core network domain. The UTRAN shall then trigger the execution of the corresponding radio interface procedure and, if applicable, start/restart the encryption device and also start/modify the integrity protection.

The CN may send a SECURITY MODE COMMAND message towards the RNC also when integrity protection and possibly ciphering has already been started for an existing signalling connection towards that core network domain. This may be used to activate new integrity protection and ciphering keys. The included integrity protection and ciphering information shall then support (at least) the integrity protection alternative and the ciphering alternative presently being used and the *Key Status IE* shall have the value "New".

When the execution of the radio interface procedure is successfully finished, the UTRAN shall return a SECURITY MODE COMPLETE message to the CN. This message shall include the *Chosen Integrity Protection Algorithm IE* and may include the *Chosen Encryption Algorithm IE*.

The *Chosen Encryption Algorithm IE* shall be included in the SECURITY MODE COMPLETE message if, and only if the *Encryption Information IE* was included in the SECURITY MODE COMMAND message.

The set of permitted algorithms specified in the SECURITY MODE COMMAND message shall remain applicable for subsequent RAB Assignments and Intra-UTRAN Relocations.

In case of a UE with Radio Access Bearers towards both core networks, the user data towards CS shall always be ciphered with the ciphering key received from CS and the user data towards PS with the ciphering key received from PS. The signalling data shall always be ciphered with the last received ciphering key and integrity protected with the last received integrity protection key from any of the two CNs.

8.18.3 Unsuccessful Operation

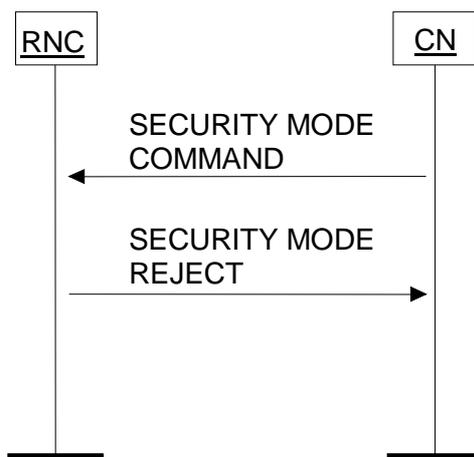


Figure 20: Security Mode Control procedure. Unsuccessful operation.

If the UTRAN or the UE is unable to support the ciphering and/or integrity protection algorithms specified in the SECURITY MODE COMMAND message, then the UTRAN shall return to the CN a SECURITY MODE REJECT message with cause value "Requested Ciphering and/or Integrity Protection Algorithms not Supported". If the radio interface Security Mode Control procedure fails, a SECURITY MODE REJECT message shall be sent to the CN with cause value "Failure in the Radio Interface Procedure".

8.18.4 Abnormal Conditions

If, when establishing a signalling connection towards a second core network domain, the integrity has already been started by the first domain and the integrity protection and ciphering information specified in the SECURITY MODE COMMAND message does not support the integrity protection alternative and the ciphering alternative presently being used, a SECURITY MODE REJECT message shall be sent to the second core network domain with cause value "Conflict with already existing Integrity protection and/or Ciphering information".

If, upon reception of a SECURITY MODE COMMAND message from a core network domain with an already existing signalling connection from that core network domain and for which integrity protection and possibly ciphering have already been started, the *Key Status* IE has the value "Old", a SECURITY MODE REJECT message shall be returned with cause value "Conflict with already existing Integrity protection and/or Ciphering information".

If, upon reception of a SECURITY MODE COMMAND message from a core network domain with an already existing signalling connection and for which integrity protection and possibly ciphering have already been started, the included integrity protection and ciphering information does not support the integrity protection alternative and the ciphering alternative presently being used, a SECURITY MODE REJECT message shall be returned with cause value "Conflict with already existing Integrity protection and/or Ciphering information".

8.19 Location Reporting Control

8.19.1 General

The purpose of the Location Reporting Control procedure is to allow the CN to request information on the location and optionally velocity of a given UE. The procedure uses connection oriented signalling.

8.19.2 Successful Operation



Figure 21: Location Reporting Control procedure. Successful operation.

The CN initiates the procedure by sending a LOCATION REPORTING CONTROL message.

The *Request Type* IE shall indicate to the serving RNC whether:

- to report directly;
- to stop a direct report;
- to report periodically;
- to stop periodic reporting;
- to report upon change of Service area, or
- to stop reporting at change of Service Area.

If reporting upon change of Service Area is requested, the Serving RNC shall report whenever the UE moves between Service Areas. For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

The *Request Type* IE shall also indicate what type of location information the serving RNC shall report. The location information is either of the following types:

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy. If the *Vertical Accuracy Code* IE is included, the *Accuracy Code* IE in the *Request Type* IE shall be present. The *Accuracy Code* IE shall be understood as the horizontal accuracy code.

A request for a direct report or for periodic reporting can be done in parallel with having an active request to report upon change of Service Area for the same UE. The request to report upon change of Service Area shall not be affected by this.

Any of the *Vertical Accuracy Code* IE, *Response Time* IE, *Positioning Priority* IE, *Client Type* IE or *Periodic Location Info* IE shall be included according to the following rules:

- Vertical Accuracy Code shall be included, if available, in connection with Geographical Area,
- Response time shall be included, if available, in connection with request for start of direct reporting of Geographical Area,
- Client type shall be included in connection with request for start of direct reporting of Geographical Area and, if available, in request for direct reporting of SAI or periodic reporting,
- Positioning Priority shall be included, if available, in connection with request for start of direct reporting or in connection with request for start of reporting upon change of Service Area,
- Periodic Location Info shall be included in connection with a request for start of periodic reporting of Geographical Area.

When no *Positioning Priority* IE is included, the RNC shall consider the request as if "Normal Priority" value had been received.

When no *Response Time* IE is included, the RNC shall consider the request as if "Delay Tolerant" value had been received.

Interaction with Relocation and Enhanced Relocation:

The order to perform location reporting at change of Service Area is lost in UTRAN at successful Relocation of SRNS. If the location reporting at change of Service Area shall continue also after the relocation has been performed, the Location Reporting Control procedure shall thus be re-initiated from the CN towards the future SRNC after the Relocation Resource Allocation procedure or the Enhanced Relocation procedure has been executed successfully.

8.19.3 Abnormal Conditions

Not applicable.

8.20 Location Report

8.20.1 General

The purpose of the Location Report procedure is to provide the UE's location and optionally velocity information to the CN. The procedure uses connection oriented signalling.

8.20.2 Successful Operation

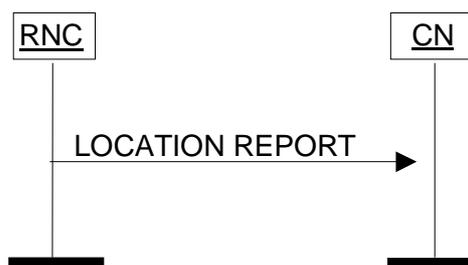


Figure 22: Location Report procedure. Successful operation.

The serving RNC initiates the procedure by generating a LOCATION REPORT message. The LOCATION REPORT message may be used as a response to a LOCATION REPORTING CONTROL message. Also, when a user enters or leaves a classified zone set by O&M, e.g. a zone where a disaster has occurred, a LOCATION REPORT message including the Service Area of the UE in the *Area Identity* IE shall be sent to the CN. The *Cause* IE shall indicate the appropriate cause value to the CN, e.g. "User Restriction Start Indication" and "User Restriction End Indication". The CN shall react to the LOCATION REPORT message with CN vendor specific actions.

For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

In case reporting at change of Service Area is requested by the CN, then the RNC shall issue a LOCATION REPORT message:

- whenever the information given in the previous LOCATION REPORT message or INITIAL UE MESSAGE message is not anymore valid.
- upon receipt of the first LOCATION REPORTING CONTROL message following a Relocation Resource Allocation procedure, with the *Event* IE included in the *Request Type* IE set to "Change of Service Area", as soon as SAI becomes available in the new SRNC and the relocation procedure has been successfully completed.

In case a Service Area is reported, the RNC shall include in the *Area Identity* IE of the LOCATION REPORT message a Service Area that includes at least one of the cells from which the UE is consuming radio resources.

In case the LOCATION REPORT message is sent as an answer to a request for a direct report, for periodic reporting or for reports at a change of Service Area, the *Request Type* IE from the LOCATION REPORTING CONTROL message shall be included.

If the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area cannot be determined by the RNC, then the *Area Identity* IE shall be omitted and a cause value shall be included to indicate that the request could not be fulfilled, e.g. "Requested Information Not Available" or "Location Reporting Congestion". The RNC may also include the *Last Known Service Area* IE.

If the RNC cannot deliver the location information as requested by the CN, due to either the non-support of the requested event or the non-support of the requested report area, or if the RNC is currently not able to reach the UE, the RNC shall indicate the UE location to be "Undetermined" by omitting the *Area Identity* IE. A cause value shall instead be added to indicate the reason for the undetermined location, e.g. "Requested Request Type not supported", "Location Reporting Congestion" or "No Resource Available".

In case of periodic reporting is requested by the CN, the RNC shall issue the first LOCATION REPORT message one reporting interval as indicated in the *Reporting Interval* IE contained in the LOCATION REPORTING CONTROL message after reception of the LOCATION REPORTING CONTROL message and continue to send LOCATION REPORT messages one reporting interval after the previous LOCATION REPORT message until the desired amount of reports as given in the *Reporting Amount* IE has been attained, or until the periodic reporting is cancelled by the CN or aborted by the RNC. When no location estimate is available at the RNC when the reporting criteria are fulfilled (e.g., due to failure of a position method itself), the RNC shall indicate the UE location to be "Undetermined" by omitting the *Area Identity* IE. A cause value shall instead be added to indicate the reason for the undetermined location, e.g. "Periodic Location Information not Available".

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include:

- the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or another type, which fulfils the requested accuracy, and
- the *Accuracy Fulfilment Indicator* IE with the value "requested accuracy fulfilled".

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report with a geographical area and whenever one of the geographic area shapes *Ellipsoid point with uncertainty Ellipse* IE, *Ellipsoid point with altitude and uncertainty Ellipsoid* IE or *Ellipsoid Arc* IE is reported, the *Confidence* IE shall indicate the probability that the UE is located within the uncertainty region of the shape. The value of the *Confidence* IE shall be in the interval of "1" to "100".

If any of the requested accuracy cannot be fulfilled, the LOCATION REPORT message shall include:

- the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or another type, with the best possible accuracy, and
- the *Accuracy Fulfilment Indicator* IE with the value "requested accuracy not fulfilled".

If the *Confidence* IE received from the UE has value "0", the RNC shall consider the requested accuracy as not fulfilled and if the received position is reported or forwarded then the confidence and uncertainty shape shall not be included (i.e. either the *Point* IE or the *Ellipsoid point with altitude* IE shall be used).

If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE, the reported *Geographical Area* IE may include an accuracy.

The LOCATION REPORT message shall also include, if available, the *Position Data* IE containing the positioning method (or list of positioning methods) used successfully to obtain the location estimate, together with the usage information.

The LOCATION REPORT message may also include, if available, the *Barometric Pressure* IE containing the uncompensated barometric pressure measured by the UE.

The LOCATION REPORT message may also include, if available, the *Civic Address* IE containing the location estimate for the UE expressed as a civic address.

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message which included a request to report with a geographical area and in which the *IncludeVelocity* IE was set to "requested", the LOCATION REPORT message shall include a *Velocity Estimate* IE, if available and if the handling of velocity is supported by the RNC.

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report with a geographical area and in which the *Client Type* IE was not included, the RNC shall answer with the *Point* IE, or the *Point With Uncertainty* IE or the *Polygon* IE within the *Geographical Area* IE of the LOCATION REPORT message.

8.20.3 Abnormal Conditions

Not applicable.

8.21 Data Volume Report

8.21.1 General

The Data Volume Report procedure is used by CN to request the unsuccessfully transmitted DL data volume for specific RABs. This procedure only applies to the PS domain. The procedure uses connection oriented signalling.

NOTE: In line with TS32.240 [61], this procedure is not used and the RNC should ignore a DATA VOLUME REPORT REQUEST message if received.

8.21.2 Successful Operation

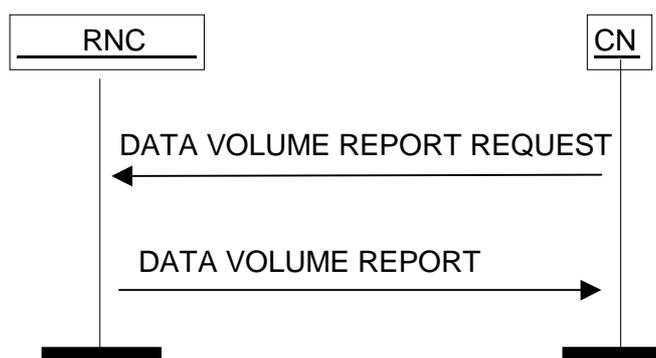


Figure 23: Data Volume Report procedure. Successful operation.

The procedure is initiated by CN by sending DATA VOLUME REPORT REQUEST message to UTRAN. This message shall contain the list of *RAB ID* IEs to identify the RABs for which the unsuccessfully transmitted DL data volume shall be reported.

At reception of a DATA VOLUME REPORT REQUEST message, the UTRAN shall produce a DATA VOLUME REPORT message. For each RAB successfully addressed within the *RAB Data Volume Report List* IE of the DATA VOLUME REPORT REQUEST message, the DATA VOLUME REPORT message shall include in the *Unsuccessfully Transmitted DL Data Volume* IE the amount of unsuccessfully transmitted DL data since the last data volume reported to the CN for the RAB and with the same data volume reference, if present. The message may also contain the *Data Volume Reference* IE.

The message may contain for each RAB successfully addressed a maximum of two *RAB Data Volume Report Item* IEs within the *RAB Data Volume Report List* IE for the case when there is a need to report two different data volumes since the last data volume indication to the CN. The UTRAN shall also reset the data volume counter for the reported RABs. The UTRAN shall send the DATA VOLUME REPORT message to the CN. Transmission and reception of the DATA VOLUME REPORT message terminate the procedure in the UTRAN and in the CN respectively.

The *Data Volume Reference* IE, if included, indicates the time when the data volume is counted.

8.21.3 Unsuccessful Operation

The *RAB ID* IE for each RAB for which UTRAN is not able to transfer a data volume report is included in the DATA VOLUME REPORT message together with a *Cause* IE, e.g. "Invalid RAB ID".

8.21.4 Abnormal Conditions

Not applicable.

8.22 Initial UE Message

8.22.1 General

The purpose of the Initial UE Message procedure is to establish an Iu signalling connection between a CN domain and the RNC and to transfer the initial NAS-PDU to the CN node as determined by the NAS Node Selection Function - if this function is active, or otherwise to the default CN node- or by the Rerouting Function (see TS 25.410 [2]) in case of MOCN configuration. The procedure uses connection oriented signalling.

8.22.2 Successful Operation

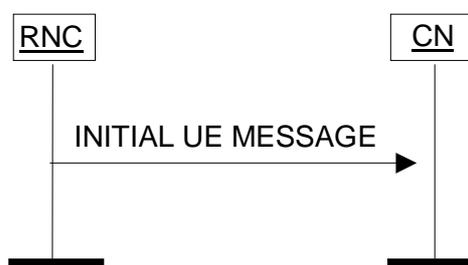


Figure 24: Initial UE Message procedure. Successful operation.

When the RNC has received from radio interface a NAS message (see TS 24.008 [8]) to be forwarded to a CN domain to which no Iu signalling connection for the UE exists, the RNC shall initiate the Initial UE Message procedure and send the INITIAL UE MESSAGE message to the CN. If NNSF is active, the selection of the CN node is made according to TS 23.236 [26].

In addition to the received NAS-PDU, the RNC shall add the following information to the INITIAL UE MESSAGE message:

- CN domain indicator, indicating the CN domain towards which this message is sent.
- For CS domain, the LAI which is the last LAI indicated to the UE by the UTRAN via the current RRC connection, or if the UTRAN has not yet indicated any LAI to the UE via the current RRC connection, then the LAI of the cell via which the current RRC connection was established.
- For PS domain, the LAI+RAC which are the last LAI+RAC indicated to the UE by UTRAN via the current RRC connection, or if the UTRAN has not yet indicated any LAI+RAC to the UE via the current RRC connection, then the LAI+RAC of the cell via which the current RRC connection was established.
- Service Area corresponding to at least one of the cells from which the UE is consuming radio resources.
- Iu signalling connection identifier.
- Global RNC identifier.
- Selected PLMN Identity, if received from radio interface by a network sharing supporting UE in shared networks.
- Redirect Attempt Flag, in MOCN configuration for a network sharing non supporting UE in order to indicate that the CN shall respond with a *Redirection Indication* IE or a *Redirection Completed* IE.

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the RNC. The value for the *Iu Signalling Connection Identifier* IE shall be allocated so as to uniquely identify an Iu signalling connection for the RNC. The CN should store and remember this identifier for the duration of the Iu connection.

Whereas several processing entities within the CN (e.g. charging, interception, etc.) may make use of the location information given in the *SAI* IE and the *LAI* (and *RAC* for PS domain) IE, the mobility management within the CN shall rely on the information given within the *LAI* IE (respectively *LAI* and *RAC* IEs for PS domain) only.

If the establishment of the Iu signalling connection towards the CN is performed due to an RRC connection establishment originating from a CSG cell and if the UE is CSG capable, the *CSG Id* IE shall be included in the INITIAL UE MESSAGE message.

If the establishment of the Iu signalling connection towards the CN is performed due to an RRC connection establishment originating from a Hybrid cell and if the UE is CSG capable, the *CSG Id* IE and *Cell Access Mode* IE shall be included in the INITIAL UE MESSAGE message.

If the RNC has a co-located L-GW for LIPA operation, it shall include the *L-GW Transport Layer Address* IE in the INITIAL UE MESSAGE message.

If the *SIPTO L-GW Transport Layer Address* IE is received in the INITIAL UE MESSAGE message, the CN shall, if supported, use it for SIPTO@LN operation as specified in TS 23.060 [21].

If the *LHN ID* IE is included in the INITIAL UE MESSAGE message, the CN shall, if supported, use it as specified in TS 23.060 [21].

If the *Higher bitrates than 16 Mbps flag* IE is included in the INITIAL UE MESSAGE message then the CN shall, if supported, use the IE as described in TS 23.060 [21].

If the *Tunnel Information for BBF* IE is received in the INITIAL UE MESSAGE message, the CN shall, if supported, use the IE as described in TS 23.139 [65].

If the *SGSN Group Identity* IE is included in the INITIAL UE MESSAGE message this indicates that the message is rerouted for DCN, and the SGSN shall, if supported, use the IE as described in TS 23.060 [21].

Interaction with Direct Transfer procedure

In MOCN configuration, if the RNC receives the *Redirection Indication* IE in the DIRECT TRANSFER message from a CN node which is not the last attempted, it shall initiate the Initial UE Message procedure towards another CN operator when possible (or possibly to the same CN in case when CS/PS coordination is required), with the following additional information in the INITIAL UE MESSAGE message:

- *NAS Sequence Number* IE, if received from previously attempted CN operator;
- *Permanent NAS UE Identity* IE, if received from one of previously attempted CN operators.

In MOCN configurations, if the RNC receives the *Redirection Indication* IE containing the *Additional CS/PS coordination information* IE in the DIRECT TRANSFER message from a CN node and if the RNC cannot identify one operator from this information as described in TS 23.251 [39], then the RNC shall if supported initiate the UE Registration Query procedure towards the CN nodes of the other domain before initiating the Initial UE Message procedure towards another CN operator.

8.22.2.1 Successful Operation for GERAN Iu-mode

For GERAN Iu-mode, the following shall apply in addition for the successful operation of the Initial UE Message procedure:

- In case of establishment of a signalling connection towards the CS domain in GERAN Iu-mode, the INITIAL UE MESSAGE message shall contain the *GERAN Classmark* IE in order to provide the CN with GERAN-specific information (see TS 43.051 [27]).

8.23 Direct Transfer

8.23.1 General

The purpose of the Direct Transfer procedure is to carry UE – CN signalling messages over the Iu Interface. The UE - CN signalling messages are not interpreted by the UTRAN, and their content (e.g. MM or CC message) is outside

the scope of this specification (see TS 24.008 [8]). The UE – CN signalling messages are transported as a parameter in the DIRECT TRANSFER messages. The procedure uses connection oriented signalling.

8.23.2 Successful Operation

8.23.2.1 CN Originated Direct Transfer



Figure 25: Direct Transfer, CN originated. Successful operation.

If a UE - CN signalling message has to be sent from the CN to the UE, the CN shall send a DIRECT TRANSFER message to the RNC including the UE - CN signalling message as a *NAS-PDU* IE.

If the DIRECT TRANSFER message is sent in the downlink direction, it shall include the *SAPI* IE and shall not include the *LAI + RAC* IE and the *SAI* IE. The use of the *SAPI* IE included in the DIRECT TRANSFER message enables the UTRAN to provide specific service for the transport of the included NAS message.

Upon receipt of the DIRECT TRANSFER message the RNC shall

- store the Subscriber Profile ID for RAT/Frequency priority IE and use it as defined in TS 36.300 [52].

In case of rerouting in MOCN configuration:

If the CN can serve the network sharing non-supporting UE and CS/PS coordination is not required, the *NAS-PDU* IE - i.e. the accept NAS message - and the *Redirection Completed* IE shall be included in the DIRECT TRANSFER message for the downlink direction.

If the CN cannot serve the network sharing non-supporting UE, the *NAS-PDU* IE - i.e. the reject NAS message - and a *Redirection Completed* IE shall be included in the DIRECT TRANSFER message for the downlink direction, except for some particular reject causes, see Annex N TS 24.008 [8]. For these particular reject causes, the *NAS-PDU* IE and the *Redirection Indication* IE shall be included in the DIRECT TRANSFER message for the downlink direction.

If CS/PS coordination is required, the *NAS-PDU* IE - i.e. the reject NAS message - and a *Redirection Indication* IE shall be included in the DIRECT TRANSFER message for the downlink direction.

The *Redirection Indication* IE shall contain:

- The *initial NAS-PDU* IE received from the UE;
- The *Reject Cause Value* IE;
- The *NAS Sequence Number* IE, if available for CS;
- The Permanent NAS UE Identity IE, if available.

The *Redirection Indication* IE may also according to TS 23.251 [39] contain:

- The *Additional CS/PS coordination information* IE;

Upon reception of the downlink DIRECT TRANSFER message including the *Redirection Indication* IE, the RNC shall store as part of the Rerouting Function the associated *Reject Cause Value* IE and *NAS-PDU* IE related to this CN. In case the *Reject Cause Value* IE is set to "CS/PS coordination required", then the RNC shall perform CS/PS coordination based on the received *Permanent NAS UE Identity* IE and the *Additional CS/PS coordination information* IE if available. In this case the *Reject Cause Value* IE and the associated *NAS-PDU* IE shall not be stored. The CS/PS coordination may also use the UE Registration Query procedure towards the CN nodes of the other domain according to TS 23.251 [39].

In case all attempted CN operators have replied with the *Redirection Indication* IE, the RNC shall select the most appropriate NAS-PDU among the *NAS-PDU* IEs received from the attempted CN nodes based on the stored information as part of the Rerouting function and send it back to the UE.

Upon reception of the downlink DIRECT TRANSFER message including the *Redirection Completed* IE, the RNC shall send back the included NAS-PDU IE to the UE and terminate the Rerouting Function.

8.23.2.2 UTRAN Originated Direct Transfer



Figure 26: Direct Transfer, RNC originated. Successful operation.

If a UE - CN signalling message has to be sent from the RNC to the CN without interpretation, the RNC shall send a DIRECT TRANSFER message to the CN including the UE - CN signalling message as a *NAS-PDU* IE.

If the DIRECT TRANSFER message shall be sent to the PS domain, the RNC shall also add the *LAI* and the *RAC* IEs, which were the last *LAI + RAC* indicated to the UE by the UTRAN via the current RRC connection, or if the UTRAN had not yet indicated any *LAI + RAC* to the UE via the current RRC connection, then the *LAI + RAC* of the cell via which the current RRC connection was established. If the DIRECT TRANSFER message is sent to the PS domain, the RNC shall also add a Service Area corresponding to at least one of the cells from which the UE is consuming radio resources. If the DIRECT TRANSFER message is sent in uplink direction, the RNC shall not include the *SAPI* IE.

If the RNC has a co-located L-GW for LIPA operation, it shall include the *L-GW Transport Layer Address* IE in the DIRECT TRANSFER message.

If the *SIPTO L-GW Transport Layer Address* IE is received in the DIRECT TRANSFER message, the CN shall, if supported, use it for SIPTO@LN operation as specified in TS 23.060 [21].

If the *LHN ID* IE is included in the DIRECT TRANSFER message, the CN shall, if supported, use it as specified in TS 23.060 [21].

8.23.3 Abnormal Conditions

If the DIRECT TRANSFER message is sent by the RNC to the PS domain, and any of the *LAI* IE, *RAC* IE or *SAI* IE is missing, the CN shall continue with the Direct Transfer procedure, ignoring the missing IE.

If the DIRECT TRANSFER message is sent by the CN to the RNC without the *SAPI* IE, the RNC shall continue with the Direct Transfer procedure.

If Redirect Attempt Flag was sent in an INITIAL UE MESSAGE and the corresponding DIRECT TRANSFER message is sent by the CN to the RNC without *Redirection Completed* IE or *Redirection Indication* IE, the RNC shall send back the included NAS-PDU IE to the UE and terminate the Rerouting Function.

If the DIRECT TRANSFER message is sent by the CN to the RNC and it contains the *SIPTO L-GW Transport Layer Address* IE, the RNC shall consider the procedure as failed.

If the DIRECT TRANSFER message is sent by the CN to the RNC and it contains the *LHN ID* IE, the RNC shall consider the procedure as failed.

8.24 Void

8.25 Overload Control

8.25.1 General

This procedure is defined to give some degree of signalling flow control. At the UTRAN side, "Processor Overload" and "Overload in the Capability to Send Signalling Messages to the UE" are catered for, and at the CN side, "Processor Overload" is catered for. The procedure uses connectionless signalling.

The philosophy used is to stem the traffic at source with known effect on the service. The algorithm used is:

At the CN side:

- If T_{igOC} is not running and an OVERLOAD message or "Signalling Point Congested" information is received, the traffic should be reduced by one step. It is also possible, optionally, to indicate the number of steps to reduce the traffic within the *Number of Steps* IE. At the same time, timers T_{igOC} and T_{inTC} should be started.
- During T_{igOC} all received OVERLOAD messages or "Signalling Point Congested" information should be ignored.
- This step by step reduction of traffic should be continued until maximum reduction is obtained by arriving at the last step.
- If T_{inTC} expires, the traffic should be increased by one step and T_{inTC} should be re-started unless the number of steps by which the traffic is reduced is back to zero.

At the UTRAN side:

- If T_{igOR} is not running and an OVERLOAD message not including the *Priority Class Indicator* IE or "Signalling Point Congested" information is received, all the traffic should be reduced by one step. It is also possible, optionally, to indicate the number of steps to reduce the traffic within the *Number of Steps* IE. At the same time, timers T_{igOR} and T_{inTR} should be started.
- If T_{igOR} is not running and an OVERLOAD message including the *Priority Class Indicator* IE is received and a procedure for reduction of all traffic is not being processed, then signalling traffic for the indicated priority class should be reduced by one step. It is also possible, optionally, to indicate the number of steps to reduce the traffic within the *Number of Steps* IE. At the same time, timers T_{igOR} and T_{inTR} should be started.
- During T_{igOR} all received OVERLOAD messages or "Signalling Point Congested" information should be ignored.
- This step-by-step reduction of traffic should be continued until maximum reduction is obtained by arriving at the last step.
- If T_{inTR} expires, the traffic should be increased by one step and T_{inTR} should be re-started unless the number of steps by which the traffic is reduced is back to zero.

The number of steps and the method for reducing the load are implementation-specific.

There may be other traffic control mechanisms from O&M activities occurring simultaneously.

8.25.2 Philosophy

Void.

8.25.3 Successful Operation

8.25.3.1 Overload at the CN



Figure 27: Overload at the CN. Successful operation.

The CN should indicate to the RNC that it is in a congested state by sending an OVERLOAD message. The *CN Domain Indicator* IE may be included, if the CN can determine the domain suffering from the signalling traffic overload. A specific CN node shall send this message only towards those RNCs from which it can receive the INITIAL UE MESSAGE message.

Reception of the message by the UTRAN should cause reduction of signalling traffic towards the CN. If the *CN Domain Indicator* IE is included in the OVERLOAD message, and the *Global CN-ID* IE is not, the RNC should apply signalling traffic reduction mechanisms towards the indicated domain. If the *Priority Class Indicator* IE is included then the RNC should take the appropriate action to reduce the traffic for the priority class indicated in the IE.

If the NNSF is active, the CN shall include the *Global CN-ID* IE within the OVERLOAD message, and the RNC should apply signalling traffic reduction mechanisms towards the indicated CN node only.

8.25.3.2 Overload at the UTRAN



Figure 28: Overload at the UTRAN. Successful operation.

If the UTRAN is not capable of sending signalling messages to UEs due to overloaded resources, the UTRAN should send an OVERLOAD message to the CN. The RNC shall include the *Global RNC-ID* IE in this message. The message shall be sent only towards those CN nodes towards which the RNC can send the INITIAL UE MESSAGE message. If the *Priority Class Indicator* IE is included it shall be ignored.

8.25.4 Abnormal Conditions

Not applicable.

8.26 Reset

8.26.1 General

The purpose of the Reset procedure is to initialise the UTRAN in the event of a failure in the CN or vice versa. The procedure uses connectionless signalling.

8.26.2 Successful Operation

8.26.2.1 Reset Procedure Initiated from the CN

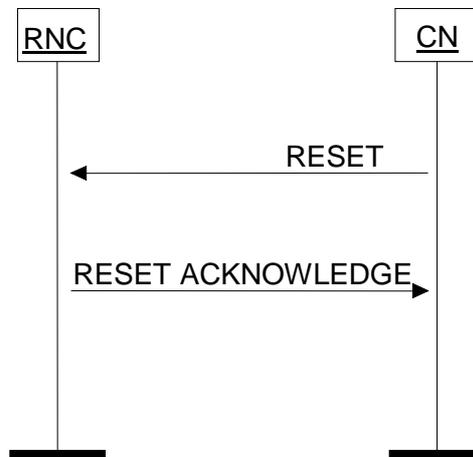


Figure 29: Reset procedure initiated from the CN. Successful operation.

In the event of a failure at the CN, which has resulted in the loss of transaction reference information, a RESET message shall be sent to the RNC. When a CN node sends this message towards an RNC for which it is not the default CN node, the *Global CN-ID* IE shall be included. This message is used by the UTRAN to release affected Radio Access Bearers and to erase all affected references for the specific CN node that sent the RESET message, i.e. the CN node indicated by the *Global CN-ID* IE or, if this IE is not included, the default CN node for the indicated CN domain.

After a guard period of T_{RatC} seconds a RESET ACKNOWLEDGE message shall be returned to the CN, indicating that all references at the UTRAN have been cleared. The RNC does not need to wait for the release of UTRAN radio resources or for the transport network layer signalling to be completed before returning the RESET ACKNOWLEDGE message.

The RNC shall include the *Global RNC-ID* IE in the RESET ACKNOWLEDGE message. The *Global RNC-ID* IE shall not be included in the RESET message.

Interactions with other procedures:

In case of interactions with other procedures, the Reset procedure shall always override all other procedures.

8.26.2.2 Reset Procedure Initiated from the UTRAN

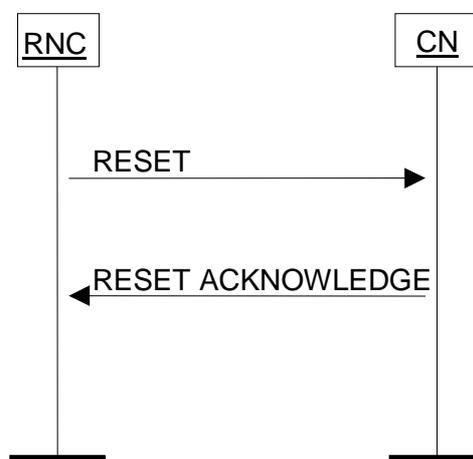


Figure 30: Reset procedure initiated from the UTRAN. Successful operation.



Figure 32: Error Indication procedure, RNC originated. Successful operation.

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

The ERROR INDICATION message shall contain at least either the *Cause* IE or the *Criticality Diagnostics* IE.

Examples for possible cause values for protocol error indications are:

- "Transfer Syntax Error"
- "Semantic Error"
- "Message not compatible with receiver state".

If the ERROR INDICATION message is sent connectionless, the *CN Domain Indicator* IE shall be present.

If the ERROR INDICATION message is sent connectionless towards the CN, the *Global RNC-ID* IE shall be present.

When an ERROR INDICATION message is sent connectionless from a CN node towards an RNC for which the sending CN node is not the default CN node, the *Global CN-ID* IE shall be included.

8.27.3 Abnormal Conditions

Not applicable.

8.28 CN Deactivate Trace

8.28.1 General

The purpose of the CN Deactivate Trace procedure is to inform the RNC to stop the trace session, initiated by a signalling based activation, for the indicated trace reference and related to the UE the Iu connection is used for. The procedure uses connection oriented signalling.

8.28.2 Successful Operation

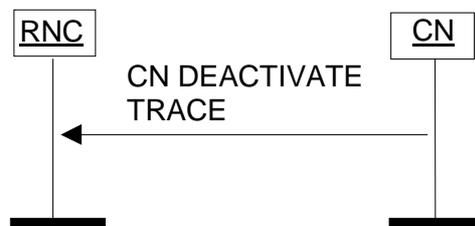


Figure 33: CN Deactivate Trace procedure. Successful operation.

The CN invokes the CN Deactivate Trace procedure by sending a CN DEACTIVATE TRACE message to the UTRAN as defined in TS 32.422 [38].

8.31.3 Unsuccessful Operation

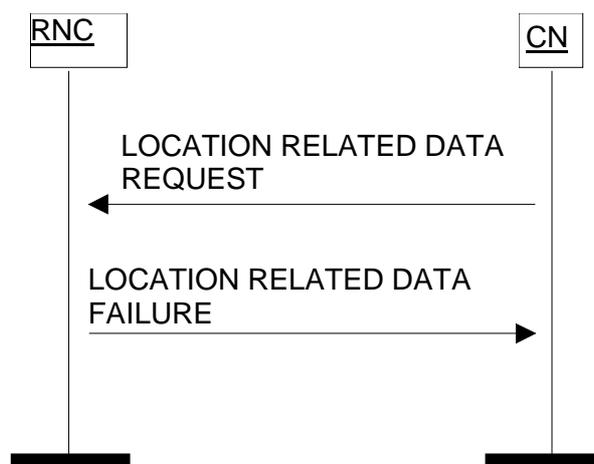


Figure 38: Location Related Data procedure. Unsuccessful operation.

If the RNC was not able to successfully deliver the requested dedicated assistance data to the UE, or if the RNC is not able to provide the requested deciphering keys, the RNC shall send a LOCATION RELATED DATA FAILURE message including the *Cause* IE to the CN. The *Cause* IE shall indicate the appropriate cause value to the CN, e.g. "Dedicated Assistance data Not Available" or "Deciphering Keys Not Available".

8.31.4 Abnormal Conditions

8.31.4.1 Abnormal Conditions for GERAN Iu mode

If the *Location Related Data Request Type* IE and *Location Related Data Request Type Specific To GERAN Iu Mode* IE are both included in the LOCATION RELATED DATA REQUEST message, the BSS shall reject the procedure by sending a LOCATION RELATED DATA FAILURE message.

If the *Location Related Data Request Type* IE is set to the value "Deciphering Keys for UE Based OTDOA" or "Dedicated Assistance Data for UE Based OTDOA", the BSS shall reject the procedure by sending a LOCATION RELATED DATA FAILURE message.

8.32 Information Transfer

8.32.1 General

The purpose of the Information Transfer procedure is to transfer information from the CN to the RNC.

This procedure uses connectionless signalling.

8.32.2 Successful Operation

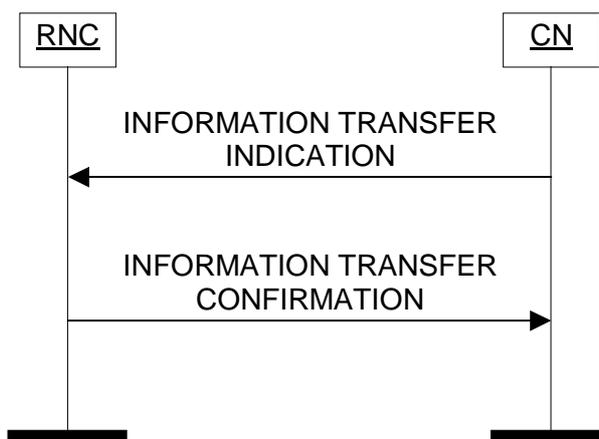


Figure 39: Information Transfer procedure. Successful operation.

The CN initiates the procedure by sending an INFORMATION TRANSFER INDICATION message to the RNC.

NOTE: The CN should initiate the Information Transfer procedure, if information is available, at least after the CN or the RNC has performed the Reset procedure or whenever the respective information has changed in the CN.

Upon reception of the INFORMATION TRANSFER INDICATION message, the RNC shall store the received information and use it according to its purpose.

The INFORMATION TRANSFER INDICATION message shall contain the following IEs:

- *Information Transfer ID*
- *Provided Data*
- *CN Domain Indicator*.

When a CN node sends this message towards an RNC for which it is not the default CN node, the *Global CN-ID* IE shall be included.

If the RNC is able to process the information contained in the *Provided Data* IE, it shall respond with the INFORMATION TRANSFER CONFIRMATION message provided with the same *Information Transfer ID* IE as the one received in the INFORMATION TRANSFER INDICATION message.

The RNC shall include the *Global RNC-ID* IE and the *CN Domain Indicator* IE in the INFORMATION TRANSFER CONFIRMATION message.

If the *Provided Data* IE contains the *Shared Network Information* IE, the RNC shall replace existing Shared Network Information provided in a previous Information Transfer procedure by the newly provided Shared Network Information.

Direction: CN → RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Information Exchange ID	M		9.2.1.71		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	ignore
Global CN-ID	O		9.2.1.46		YES	ignore
Cause	M		9.2.1.4		YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore

9.1.58 MBMS SESSION START

This message is sent by the CN to establish a MBMS Iu signalling connection and if needed a MBMS RAB.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

				<p>the IEs "<i>Maximum Bit Rate</i>". The value 0 of RAB Subflow Combination bitrate indicates that the RAB uses discontinuous transfer of the SDUs.</p>		
--	--	--	--	--	--	--

				Usage: Queuing of the RAB is allowed Queuing of the RAB is not allowed Queuing allowed indicator applies for the entire duration of the RAB, unless modified.		
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9.2.1.4 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the RANAP protocol.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Radio Network Layer				
			procedure(32), Repeated Integrity Checking Failure(37), Requested Request Type not supported(38), Request superseded(39), Release due to UE generated signalling connection release(40), Resource Optimisation Relocation(41), Requested Information Not Available(42), Relocation desirable for radio reasons (43), Relocation not supported in Target RNC or Target system(44), Directed Retry (45), Radio Connection With UE Lost(46), RNC unable to establish all RFCs (47), Deciphering Keys Not Available(48), Dedicated Assistance data Not Available(49), Relocation Target not allowed(50), Location Reporting Congestion(51), Reduce Load in Serving Cell (52), No Radio Resources Available in Target cell (53), GERAN Iu-mode failure (54), Access Restricted Due to Shared Networks(55), Incoming Relocation Not Supported Due To PUESBINE Feature(56), Traffic Load In The Target Cell Higher Than In The Source Cell(57), MBMS - No Multicast Service For This UE(58), MBMS - Unknown UE ID(59), Successful MBMS Session Start - No Data Bearer Necessary(60), MBMS - Superseded Due To NNSF(61), MBMS - UE Linking Already Done(62), MBMS - UE De-Linking Failure - No Existing UE Linking(63), TMGI Unknown(64)	
>Radio Network Layer				
>>Transport Layer Cause	M		INTEGER (Signalling Transport Resource Failure(65),	Value range is 65 – 80.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Radio Network Layer				
			invalid CSG Id (269))	

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

Range bound	Explanation
maxnoofRABs	Maximum no. of RABs for one UE. Value is 256.
maxRABSubflows	Maximum no. of subflows per RAB. Value is 7.
maxnoofSRBs	Maximum no. of SRBs per RAB. Value is 8.

9.2.1.29 Old BSS to New BSS Information

The coding of this element is described in TS 48.008 [11].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Old BSS To New BSS Information	M		OCTET STRING	Coded as the <i>Old BSS to New BSS information elements</i> field of the <i>Old BSS to New BSS Information</i> IE defined in TS 48.008 [11].

9.2.1.30 Target RNC to Source RNC Transparent Container

The *Target RNC to Source RNC Transparent Container* IE is an information element that is produced by the target RNC and is transmitted to the source RNC. In inter-system handovers to UTRAN, the IE is transmitted from the target RNC to the external relocation source.

This IE is transparent to CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC Container	M		OCTET STRING	
d-RNTI	O		INTEGER (0..1048575)	May be included to allow the triggering of the Relocation Detect procedure from the Iur Interface.

9.2.1.30a Source to Target Transparent Container

The *Source to Target Transparent Container* IE is an information element that is provided by the source RAN node to the target RAN node.

This IE is transparent to CN.

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. In inter-system handovers from UTRAN, the IE is encoded according to the specifications of the target system. Note: In the current version of this specification, this IE may either carry the <i>Source RNC to Target RNC Transparent Container</i> or the <i>Source eNB to Target eNB Transparent Container</i> IE as defined in TS 36.413 [49].

9.2.1.30b Target to Source Transparent Container

The *Target to Source Transparent Container* IE is an information element that is provided by the target RAN node to the source RAN node.

This IE is transparent to CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Target to Source Transparent Container	M		OCTET STRING	Note: In the current version of this specification, this IE may either carry the <i>Target RNC to Source RNC Transparent Container</i> or the <i>Target eNB to Source eNB Transparent Container</i> IE as defined in TS 36.413 [49].

9.2.1.30c TAI

This element is used to uniquely identify a Tracking Area as defined in TS 36.413 [49].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN identity	M		9.2.3.55	
TAC	M		OCTET STRING (SIZE (2))	

9.2.1.31 L3 Information

The coding of this element is described in TS 48.008 [11].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
L3 Information	M		OCTET STRING	Coded as the value part of the <i>Layer 3 Information</i> IE defined in TS 48.008 [11] (i.e. excluding the <i>Element Identifier</i> and the <i>Length</i> fields).

9.2.1.32 Number of Steps

Indicates the number of steps to reduce traffic in overload situation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Number Of Steps	M		INTEGER (1..16)	

9.2.1.33 DL N-PDU Sequence Number

This IE indicates the radio interface sequence number (PDCP) TS 25.323 [17] of the next downlink N-PDU (PDCP SDU) that would have been sent to the UE by a source system.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL N-PDU Sequence Number	M		INTEGER (0..65535)	This IE indicates the sequence number of the next DL N-PDU that would have been sent to the UE by a source system. This is the 16 bit sequence number.

9.2.1.34 UL N-PDU Sequence Number

This IE indicates the radio interface sequence number (PDCP) TS 25.323 [17] of the next uplink N-PDU (PDCP SDU) that would have been expected from the UE by a source system.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL N-PDU Sequence Number	M		INTEGER (0..65535)	This IE indicates the sequence number of the next UL N-PDU that would have been expected from the UE by a source system. This is the 16 bit sequence number.

9.2.1.35 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the RNC or the CN 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 Annex A.2.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Criticality Diagnostics						
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error.		
>Triggering Message	O		ENUMERATE D(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.		
>Procedure Criticality	O		ENUMERATE D(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure).		
Information Element Criticality Diagnostics		<i>0 to <maxnoo ferrors></i>				
>IE Criticality	M		ENUMERATE D(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.		
>IE ID	M		INTEGER (0..65535)	The IE ID of the not understood or missing IE.		
>Repetition Number	O		INTEGER (0..255)	<p>The <i>Repetition Number</i> IE gives</p> <ul style="list-style-type: none"> in case of a not understood IE: The number of occurrences of the reported IE up to and including the not understood occurrence in case of a missing IE: The number of occurrences up to but not including the missing occurrence. <p>Note: All the counted occurrences of the reported IE must have the same topdown hierarchical message structure of IEs with assigned criticality above them.</p>		
>Message Structure	O		9.2.1.42	The <i>Message Structure</i> IE describes	YES	ignore

				the structure where the not understood or missing IE was detected. This IE is included if the not understood IE is not the top level of the message.		
>Type of Error	M		ENUMERATED(not understood, missing, ...)		YES	ignore

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

9.2.1.36 Key Status

This IE tells if the keys included in a SECURITY MODE COMMAND message are new or if they have been used previously.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Key Status	M		ENUMERATED (old, new, ...)	

9.2.1.37 DRX Cycle Length Coefficient

This IE indicates the DRX cycle length coefficient (k) as defined in TS 25.331 [10].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRX Cycle Length Coefficient	M		INTEGER (6..9)	

9.2.1.38 Iu Signalling Connection Identifier

This IE uniquely identifies an Iu signalling connection between a given RNC and a given CN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Iu Signalling Connection Identifier	M		BIT STRING (SIZE(24))	The most significant bit of this IE shall indicate the node, that has assigned the value. MSB = "0": assigned by the RNC; MSB = "1": assigned by the CN.

9.2.1.39 Global RNC-ID

The Global RNC-ID is used to globally identify an RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN identity	M		9.2.3.55	
RNC-ID	M		INTEGER (0..4095)	If the <i>Extended RNC-ID</i> IE is included in the message, the <i>RNC-ID</i> IE shall be ignored.

9.2.1.39a Extended RNC-ID

The Extended RNC-ID is used to identify an RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended RNC-ID	M		INTEGER (4096..65535)	The <i>Extended RNC-ID</i> IE shall be used if the RNC identity has a value larger than 4095. Note: Application of the <i>Extended RNC-ID</i> IE to very large networks is FFS.

9.2.1.40 PDP Type Information

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDP Type Information	M	1 to <maxnoofPDPDirections>	ENUMERATED(empty, PPP, OSP:IHOSS, IPv4, IPv6,...)	PDP Type is defined in TS 24.008 [8], and the restrictions on usage shall comply with TS 24.008 [8]. Usage: When the IE is repeated then PDP Type for downlink is signalled first, followed by PDP Type for uplink; when the IE is not repeated, the PDP Type shall apply to both uplink and downlink. OSP:IHOSS: This value shall not be used.

Range bound	Explanation
maxnoofPDPDirections	Number of directions for which PDP Type is signalled separately

9.2.1.40a PDP Type Information extension

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDP Type Information extension	M	1 to <maxnoofPDPDirections>	ENUMERATED(IPv4 and IPv6,...)	PDP Type is defined in TS 24.008 [8], and the restrictions on usage shall comply with TS 24.008 [8]. Usage: When the IE is repeated then PDP Type for downlink is signalled first, followed by PDP Type for uplink; when the IE is not repeated, the PDP Type shall apply to both uplink and downlink.

Range bound	Explanation
maxnoofPDPDirections	Number of directions for which PDP Type is signalled separately

9.2.1.41 Service Handover

This IE tells if intersystem handover to GSM should, should not, or shall not be performed for a given RAB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Service Handover	M		ENUMERATED (Handover to GSM should be performed, Handover to GSM should not be performed, Handover to GSM shall not be performed, ...)	

9.2.1.42 Message Structure

The *Message Structure* IE gives information for each level with assigned criticality in a hierarchical message structure from top level down to the lowest level above the reported level for the occurred error (reported in the *Information Element Criticality Diagnostics* IE).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message structure		1 to <maxnooflevels>		The first repetition of the <i>Message Structure</i> IE corresponds to the top level of the message. The last repetition of the <i>Message Structure</i> IE corresponds to the level above the reported level for the occurred error of the message.	GLOBAL	ignore
>IE ID	M		INTEGER (0..65535)	The IE ID of this level's IE containing the not understood or missing IE.	-	
>Repetition Number	O		INTEGER (1..256)	The <i>Repetition Number</i> IE gives, if applicable, the number of occurrences of this level's reported IE up to and including the occurrence containing the not understood or missing IE. Note: All the counted occurrences of the reported IE must have the same topdown hierarchical message structure of IEs with assigned criticality above them.	-	

Range bound	Explanation
maxnooflevels	Maximum no. of message levels to report. The value for maxnooflevels is 256.

9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to indicate that:

- Either RAB QoS negotiation is allowed for certain RAB parameters and, in some cases, to indicate also which alternative values to be used in the negotiation;
- Or an alternative RAB configuration can be requested by the RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Alternative RAB parameter values						
>Alternative Maximum Bit Rate information	O			Included only if negotiation is allowed for this IE.	-	
>>Type of Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.		
>>Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesM BR	1 to <nr-Alternative Values>		For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values; 1 to 16 discrete values can be given.		
>>>Bit Rate	M	1 to <nr-Separate TrafficDirections>	INTEGER (1..16,000,000)	When nr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.		
>Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.	-	
>>Type of Alternative Guaranteed Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.		
>>Alternative Guaranteed Bit Rates	C - ifValueRangeorDiscreteValuesG BR	1 to <nr-Alternative Values>		For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values, 1 to 16 discrete values can be given.		
>>>Bit Rate	M	1 to <nr-Separate TrafficDirections>	INTEGER (1..16,000,000)	When nr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.		
>Alternative RAB Configuration	O		RAB Parameters 9.2.1.3	Indicates the possibility for RNC to request CN to execute the included alternative RAB configuration, e.g., for network-initiated SCUDIF purpose TS 23.172 [43].	YES	ignore
>Extended Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.	YES	ignore
>>Type of Extended Alternative Guaranteed Bit	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is		

Rate Information				allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters IE</i> .		
>>Extended Alternative Guaranteed Bit Rates	C - ifValueRangeorDiscreteValuesGBR	1 to <nr-Alternative Values		For Value Range, one value limit is given here and the other given by Extended Guaranteed Bit Rate in the <i>RAB Parameters IE</i> . For Discrete Values; 1 to 16 discrete values can be given.		
>>>Extended Bit Rate	M	1 to <nr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.		
>Extended Alternative Maximum Bit Rate Information	O			Included only if negotiation is allowed for this IE.	YES	ignore
>>Type of Extended Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters IE</i> .		
>>Extended Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesMBR	1 to <nr-Alternative Values>		For Value Range, one value limit is given here and the other given by Extended Maximum Bit Rate in the <i>RAB Parameters IE</i> . For Discrete Values; 1 to 16 discrete values can be given.		
>>>Extended Bit Rate	M	1 to <nr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.		
>Supported Alternative Maximum Bit Rate Information	O			Included only if negotiation is allowed for this IE.	EACH	reject
>>Type of Supported Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters IE</i> .	-	
>>Supported Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesGBR	1 to <nr-Alternative Values>		For Value Range, one value limit is given here and the other given by Supported Maximum Bit Rate in the <i>RAB Parameters IE</i> . For Discrete Values; 1 to 16 discrete values can be given.	-	
>>>Supported Bit Rate		1 to <nr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000,...)	When nr-SeparateTrafficDirections is equal to 2, then the Supported Bit Rate attribute for downlink is	-	

				signalled first, then the Supported Bit Rate attribute for uplink.		
>Supported Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.	EACH	reject
>>Type of Supported Alternative Guaranteed Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values,...)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters IE</i> .	-	
>>Supported Alternative Guaranteed Bit Rates	C - ifValueRangeorDiscreteValuesGBR	1 to <nr-AlternativeValues>		For Value Range, one value limit is given here and the other given by Supported Guaranteed Bit Rate in the <i>RAB Parameters IE</i> . For Discrete Values; 1 to 16 discrete values can be given.	-	
>>>Supported Bit Rate		1 to <nr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000,...)	When nr-SeparateTrafficDirections is equal to 2, then the Supported Bit Rate attribute for downlink is signalled first, then the Supported Bit Rate attribute for uplink.	-	

Range Bound	Explanation
nr-AlternativeValues	Maximum number of alternative values. Value is 1 in case of Value Range and 16 in case of Discrete Values.
nr-SeparateTrafficDirections	Number of Traffic Directions being signalled separately. Set to 2 if RAB asymmetry indicator is asymmetric bidirectional. Set to 1 in all other cases.

Condition	Explanation
ifValueRangeorDiscreteValuesMBR	This IE shall be present if the <i>Type of Alternative Maximum Bit Rates Information IE</i> is set to "Value range" or "Discrete values".
ifValueRangeorDiscreteValuesGBR	This IE shall be present if the <i>Type of Guaranteed Bit Rates Information IE</i> is set to "Value range" or "Discrete values".

9.2.1.44 Assigned RAB Parameter Values

The purpose of the *Assigned RAB Parameter Values IE* is to indicate that RAB QoS negotiation has been performed for certain RAB parameters and which values have been chosen.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Assigned RAB parameter values						
>Assigned Maximum Bit Rate	O	1 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then Assigned Maximum Bit Rate attribute for downlink is signalled first, then Assigned Maximum Bit Rate attribute for uplink.	-	
>Assigned Guaranteed Bit Rate	O	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.	-	
>Extended Assigned Maximum Bit Rate	O	1 to <nbr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then Assigned Maximum Bit Rate attribute for downlink is signalled first, then Assigned Maximum Bit Rate attribute for uplink.	YES	reject
>Extended Assigned Guaranteed Bit Rate	O	1 to <nbr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.	YES	reject
>Supported Assigned Maximum Bit Rate	O	0 to <nbr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000, ...)	When nbr-SeparateTrafficDirections is equal to 2, then Supported Assigned Maximum Bit Rate attribute for downlink is signalled first, then Supported Assigned Maximum Bit Rate attribute for uplink.	YES	ignore
>Supported Assigned Guaranteed Bit Rate	O	0 to <nbr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000, ...)	When nbr-SeparateTrafficDirections is equal to 2, then Supported Assigned Guaranteed Bit Rate for downlink is signalled first, then Supported Assigned Guaranteed Bit Rate for uplink.	YES	ignore

Range Bound	Explanation
nbr-SeparateTrafficDirections	Number of Traffic Directions being signalled separately. Set to 2 if RAB asymmetry indicator is asymmetric bidirectional. Set to 1 in all other cases.

9.2.1.45 Requested RAB Parameter Values

The purpose of *Requested RAB Parameter Values* IE is to either indicate the RAB parameters for which the included different values are being requested, or indicate that the execution of the alternative RAB configuration is requested.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Requested RAB Parameter Values						
>Requested Maximum Bit Rate	O	1 to <nr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.	-	
>Requested Guaranteed Bit Rate	O	1 to <nr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.	-	
>Alternative RAB Configuration Request	O		ENUMERATED (Alternative RAB configuration Requested, ...)	Indicates a request to trigger the execution of the alternative RAB Configuration e.g. for network-initiated SCUDIF purpose TS 23.172 [43].	YES	ignore
>Extended Requested Maximum Bit Rate	O	1 to <nr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.	YES	reject
>Extended Requested Guaranteed Bit Rate	O	1 to <nr-SeparateTrafficDirections>	INTEGER (16,000,001..256,000,000)	When nr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.	YES	reject
>Supported Requested Maximum Bit Rate	O	0 to <nr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000, ...)	When nr-SeparateTrafficDirections is equal to 2, Supported Requested Maximum Bit Rate attribute for downlink is signalled first, then Supported Requested Maximum Bit Rate attribute for uplink.	YES	reject
>Supported Requested Guaranteed Bit Rate	O	0 to <nr-SeparateTrafficDirections>	INTEGER (1..1,000,000,000, ...)	When nr-SeparateTrafficDirections is equal to 2, Supported Requested Guaranteed Bit Rate for downlink is signalled first,	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Requested RAB Parameter Values						
				then Supported Requested Guaranteed Bit Rate for uplink.		

Range bound	Explanation
nbr-SeparateTrafficDirections	Number of Traffic Directions being signalled separately. Set to 2 if RAB Asymmetry Indicator is asymmetric bidirectional. Set to 1 in all other cases.

9.2.1.46 Global CN-ID

Global CN-ID is used to globally identify a CN node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN identity	M		9.2.3.55	
CN-ID	M		INTEGER (0..4095)	

9.2.1.46a Vertical Accuracy Code

This element includes information about the requested vertical accuracy.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Vertical Accuracy Code	M		INTEGER (0..127)	The requested accuracy "v" is derived from the "accuracy code" k by $v = 45x(1.025^k - 1)$.

9.2.1.46b Response Time

This element includes information about the requested response time.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Response Time	M		ENUMERATED (Low Delay, Delay Tolerant, ...)	The value refers to TS 22.071 [30].

9.2.1.46c Positioning Priority

This element includes information about the requested positioning priority.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Positioning Priority	M		ENUMERATED (High Priority, Normal Priority, ...)	The value refers to TS 22.071 [30].

9.2.1.46d Client Type

This element includes information about the client type.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Client Type	M		ENUMERATED(Emergency Services, Value Added Services, PLMN Operator Services, Lawful Intercept Services, PLMN Operator - broadcast services, PLMN Operator - O&M, PLMN Operator - anonymous statistics, PLMN Operator - Target MS service support, ...)	Identifies the type of client.

9.2.1.47 New BSS to Old BSS Information

The coding of this element is described in TS 48.008 [11].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
New BSS To Old BSS Information	M		OCTET STRING	Contents defined in TS 48.008 [11].

9.2.1.48 Inter-System Information Transparent Container

The *Inter-System Information Transparent Container* IE is an information element that is produced by the external relocation target system and is transmitted to a source RNC. This IE is transparent to the CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Downlink Cell Load Information	O		Cell Load Information 9.2.1.49	For the Downlink.
Uplink Cell Load Information	O		Cell Load Information 9.2.1.49	For the Uplink.

9.2.1.49 Cell Load Information

The *Cell Load Information* IE contains the load information of a specific (serving or target) cell for either the Downlink or the Uplink. If the RNC supports cell load-based inter-system handover, this information shall be understood, when available, as the current traffic load in the target cell if included in a RELOCATION PREPARATION FAILURE message, or the traffic load in the target cell assuming a successful completion of the handover in progress if included in a RELOCATION COMMAND message.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Capacity Class Value	M		9.2.1.50	
Load Value	M		9.2.1.51	
RT Load Value	O		9.2.1.52	
NRT Load Information Value	O		9.2.1.53	

9.2.1.50 Cell Capacity Class Value

The *Cell Capacity Class Value* IE is the value that classifies the cell capacity with regards to the other cells. The *Cell Capacity Class Value* IE only indicates resources that are configured for traffic purposes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Capacity Class Value	M		INTEGER (1..100,...)	Value 1 shall indicate the minimum cell capacity, and 100 shall indicate the maximum cell capacity. There should be linear relation between cell capacity and Cell Capacity Class Value.

9.2.1.51 Load Value

The *Load Value* IE contains the total cell load relative to the maximum planned load. It is defined as the load percentage of the Cell Capacity Class.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Load Value	M		INTEGER (0..100)	Value 0 shall indicate the minimum load, and 100 shall indicate the maximum load. Load Value should be measured on a linear scale.

9.2.1.52 RT Load Value

The *RT Load Value* IE indicates in percents the ratio of the load generated by Real Time traffic relative to the measured Load Value. Real Time traffic corresponds to the Conversational and Streaming traffic classes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RT Load Value	M		INTEGER (0..100)	

9.2.1.53 NRT Load Information Value

The *NRT Load Information Value* IE indicates the load situation on the cell for the Non Real-Time traffic. Non Real Time traffic corresponds to the Interactive and Background traffic classes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NRT Load Information Value	M		INTEGER (0..3)	Mapping of the status: 0: low: The NRT load is low. 1: medium: The NRT load is medium. 2: high: NRT load is high. Probability to admit a new user is low. 3: overloaded: NRT overload. The probability to admit a new user is low, packets are discarded and the source is recommended to reduce the data flow.

9.2.1.54 Source RNC PDCP context info

The purpose of the *Source RNC PDCP context info* IE is to transfer RNC PDCP context information from a source RNC to a target RNC during an SRNS relocation.

This IE is transparent to CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC Container	M		OCTET STRING	

9.2.1.55 Information Transfer ID

Indicates the identity of an information transfer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Information Transfer ID	M		INTEGER (0..2 ²⁰ -1)	

9.2.1.56 Provided Data

Provides the data that is transferred in an information transfer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Provided Data				
> SNA				
>>Shared Network Information	M		9.2.3.23	

9.2.1.57 GERAN Classmark

The purpose of the *GERAN Classmark* IE is to transfer GERAN-specific information to the CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
GERAN Classmark	M		OCTET STRING	Contents defined in TS 48.008 [11].

9.2.1.58 GERAN BSC Container

The purpose of the *GERAN BSC Container* IE is to transfer GERAN-specific information from the CN to the GERAN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
GERAN BSC Container	M		OCTET STRING	Contents defined in TS 48.008 [11].

9.2.1.59 UESBI-Iu

The purpose of the *UESBI-Iu* IE is to either transfer the UE Specific Behaviour Information as defined in TR 25.994 [31] and TR 25.995 [32] or IMEISV from the CN to the RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UESBI-IuA	O		BIT STRING (SIZE(1..128))	<p>The <i>UESBI-IuA</i> provides either compliance status information about the UE with regards to specific behaviours described in TR 25.994 [31] or a bit string length 64 containing IMEISV. Length 64 is reserved for IMEISV other bit string lengths may be used for UESBI.</p> <p>TR 25.994 [31] defines the mapping between the descriptions in TR 25.994 [31] and the <i>UESBI-IuA</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in TR 25.994 [31].</p>
UESBI-IuB	O		BIT STRING (SIZE(1..128))	<p>The <i>UESBI-IuB</i> provides compliance status information about the UE with regards to specific behaviours described in TR 25.995 [32].</p> <p>TR 25.995 [32] defines the mapping between the descriptions in TR 25.995 [32] and the <i>UESBI-IuB</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in TR 25.995 [32].</p>

9.2.1.60 Cell Load Information Group

The *Cell Load Information Group* IE is an information element that is produced by source system BSC and is transmitted to target system RNC via transparent containers. This IE contains the load information of the source cell for either the Downlink or the Uplink or both as well as the source cell identifier the included cell load information corresponds to. If the RNC supports cell load-based inter-system handover, this information shall be understood, when available, as the current traffic load in the indicated source cell prior to the relocation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Source Cell Identifier	M		9.2.1.61	The source cell identifier the downlink and uplink cell load information correspond to.
Downlink Cell Load Information	O		Cell Load Information 9.2.1.49	For the Downlink.
Uplink Cell Load Information	O		Cell Load Information 9.2.1.49	For the Uplink.

9.2.1.61 Source Cell Identifier

The *Source Cell Identifier* IE identifies the involved cell of the source system for the relocation of SRNS. The *Source Cell Identifier* IE may be e.g. source GERAN Source Cell ID (in case of GSM to UMTS relocation) or the UTRAN Source Cell ID (in case of UMTS to GSM relocation).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Source Cell Identifier				
> UTRAN				
>> UTRAN Source Cell ID	M			
>>>PLMN identity	M		9.2.3.55	
>>>Source Cell ID	M		INTEGER (0..268435455)	This information element identifies a cell uniquely within UTRAN and consists of RNC-ID and C-ID as defined in TS 25.401 [3].
> GERAN				
>> GERAN Source Cell ID	M			
>>>PLMN identity	M		9.2.3.55	
>>>LAC	M		OCTET STRING (SIZE(2))	0000 and FFFE not allowed.
>>>CI	M		OCTET STRING (SIZE(2))	

9.2.1.62 Inter-system Information Transfer Type

Indicates the type of information that the RNC requests to transfer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Inter-system Information Transfer Type				
> RIM				
>>RIM Transfer	M		9.2.3.30	

9.2.1.63 Information Transfer Type

Indicates the type of information that the RNC requests to transfer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Information Transfer Type				
> RNC Trace				
>>RNC Trace Session Information	M		9.2.1.64	

9.2.1.64 RNC Trace Session Information

Indicates the information on a Trace Session activated by Management in the RNC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Trace Reference	M		9.2.1.8		-	-
Trace Activation Indicator	M		ENUMERATED (Activated, Deactivated)		-	-
Equipments To Be Traced	C-IfActivated		9.2.1.65		-	-
Trace Recording Session Reference	O		9.2.1.67		YES	ignore
IMSI	O		OCTET STRING (SIZE (3..8))	<ul style="list-style-type: none"> - digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n <p>-Number of decimal digits shall be from 6 to 15 starting with the digits from the PLMN identity. When the IMSI is made of an odd number of digits, the filler digit shall be added at the end to make an even number of digits of length 2N. The filler digit shall then be consequently encoded as bit 8 to 5 of octet N.</p>	YES	ignore
Trace Collection Entity IP Address	O		Transport Layer Address 9.2.2.1		YES	ignore
Serving Cell Identifier	O		UTRAN Cell Identifier 9.2.1.122	Immediate MDT only.	YES	ignore

Condition	Explanation
ifActivated	This IE shall be present if the <i>Trace Activation Indicator</i> IE is set to "Activated".

9.2.1.65 Equipments To Be Traced

Indicates the UEs that the RNC has to trace using a list of Equipment Identities or a mask on an Equipment Identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Equipments To Be Traced				
>IMEI List				
>>IMEI List		1 to <MaxUEsToBeTraced>		
>>>IMEI	M		OCTET STRING (SIZE (8))	- hexadecimal digits 0 to F, two hexadecimal digits per octet, - each hexadecimal digit encoded 0000 to 1111, - 1111 used as filler for bits 8 to 5 of last octet - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n Number of hexadecimal digits shall be 15.
>IMEISV List				
>>IMEISV List		1 to <MaxUEsToBeTraced>		
>>>IMEISV	M		OCTET STRING (SIZE (8))	- hexadecimal digits 0 to F, two hexadecimal digits per octet, - each hexadecimal digit encoded 0000 to 1111, - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n Number of hexadecimal digits shall be 16.
>IMEI Group				
>>IMEI	M		OCTET STRING (SIZE (8))	- hexadecimal digits 0 to F, two hexadecimal digits per octet, - each hexadecimal digit encoded 0000 to 1111, - 1111 used as filler for bits 8 to 5 of last octet - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n Number of hexadecimal digits shall be 15.
>>IMEI Mask	M		BIT STRING (SIZE (7))	
>IMEISV Group				
>>IMEISV	M		OCTET STRING (SIZE (8))	- hexadecimal digits 0 to F, two hexadecimal digits per octet, - each hexadecimal digit encoded 0000 to 1111, - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n Number of hexadecimal digits shall be 16.


```

}

enhancedRelocationCompleteConfirm RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  EnhancedRelocationCompleteConfirm
  PROCEDURE CODE      id-enhancedRelocationCompleteConfirm
  CRITICALITY         ignore
}

rANAP-enhancedRelocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RANAP-EnhancedRelocationInformationRequest
  SUCCESSFUL OUTCOME  RANAP-EnhancedRelocationInformationResponse
  PROCEDURE CODE      id-RANAPenhancedRelocation
  CRITICALITY         reject
}

SRVCCPreparation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  SRVCC-CSKeysRequest
  OUTCOME             SRVCC-CSKeysResponse
  PROCEDURE CODE      id-SRVCCPreparation
  CRITICALITY         reject
}

ueRadioCapabilityMatch RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  UeRadioCapabilityMatchRequest
  OUTCOME             UeRadioCapabilityMatchResponse
  PROCEDURE CODE      id-UeRadioCapabilityMatch
  CRITICALITY         ignore
}

ueRegistrationQuery RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  UeRegistrationQueryRequest
  OUTCOME             UeRegistrationQueryResponse
  PROCEDURE CODE      id-UeRegistrationQuery
  CRITICALITY         ignore
}

rerouteNASRequest RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RerouteNASRequest
  PROCEDURE CODE      id-RerouteNASRequest
  CRITICALITY         reject
}

END

```

9.3.3 PDU Definitions

```

-- *****
--
-- PDU definitions for RANAP.
--
-- *****

RANAP-PDU-Contents {

```

```
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-PDU-Contents (1) }
```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

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

```
IMPORTS
```

```
    AccuracyFulfilmentIndicator,
    APN,
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    Cell-Access-Mode,
    ClientType,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    CSG-Id,
    CSG-Id-List,
    CSG-Membership-Status,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DeltaRAListofIdleModeUEs,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    EncryptionKey,
    E-UTRAN-Service-Handover,
    ExtendedRNC-ID,
    FrequencyLayerConvergenceFlag,
    GERAN-BSC-Container,
    GERAN-Classmark,
    GlobalCN-ID,
    GlobalRNC-ID,
    GTP-TEI,
    IncludeVelocity,
    InformationExchangeID,
    InformationExchangeType,
    InformationRequested,
    InformationRequestType,
```

InformationTransferID,
InformationTransferType,
InterSystemInformationTransferType,
IntegrityProtectionInformation,
IntegrityProtectionKey,
InterSystemInformation-TransparentContainer,
IPMulticastAddress,
IuSignallingConnectionIdentifier,
IuTransportAssociation,
KeyStatus,
L3-Information,
LAI,
LastKnownServiceArea,
Correlation-ID,
MBMS-PTP-RAB-ID,
MBMSBearerServiceType,
MBMSCountingInformation,
MBMSCNDe-Registration,
MBMSHCIndicator,
MBMSRegistrationRequestType,
MBMSServiceArea,
MBMSSessionDuration,
MBMSSessionIdentity,
MBMSSessionRepetitionNumber,
MSISDN,
NAS-PDU,
NAS-SequenceNumber,
NAS-SynchronisationIndicator,
NewBSS-To-OldBSS-Information,
NonSearchingIndication,
NumberOfSteps,
Offload-RAB-Parameters,
Offload-RAB-Parameters-APN,
Offload-RAB-Parameters-ChargingCharacteristics,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PDP-TypeInformation-extension,
PermanentNAS-UE-ID,
PLMNIdentity,
PositionData,
PositionDataSpecificToGERANIuMode,
PositioningPriority,
ProvidedData,
PowerSavingIndicator,
RAB-ID,
RAB-Parameters,
RAC,
RAListofIdleModeUEs,
RAT-Type,
RedirectAttemptFlag,
RedirectionCompleted,

RejectCauseValue,
RelocationType,
RequestedGANSSTransmissionData,
RequestType,
Requested-RAB-Parameter-Values,
ResponseTime,
RRC-Container,
RSRVCC-Operation-Possible,
RSRQ-Type,
RSRQ-Extension,
SAI,
SAPI,
Service-Handover,
SessionUpdateID,
SNA-Access-Information,
SourceBSS-ToTargetBSS-TransparentContainer,
SourceID,
Source-ToTarget-TransparentContainer,
SourceRNC-ToTargetRNC-TransparentContainer,
SRVCC-HO-Indication,
SRVCC-Information,
SRVCC-Operation-Possible,
TargetBSS-ToSourceBSS-TransparentContainer,
TargetID,
Target-ToSource-TransparentContainer,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TimeToMBMSDataTransfer,
TMGI,
TracePropagationParameters,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,
UE-AggregateMaximumBitRate,
UE-ID,
UESBI-Iu,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
VelocityEstimate,
VerticalAccuracyCode,
VoiceSupportMatchIndicator,
Alt-RAB-Parameters,
Ass-RAB-Parameters,
PeriodicLocationInfo,
SubscriberProfileIDforRFP,
RNSAPRelocationParameters,
RABParametersList,
MDT-Configuration,
Priority-Class-Indicator,
Management-Based-MDT-Allowed,

HigherBitratesThan16MbpsFlag,
End-Of-CSFB,
Out-Of-UTRAN,
RSRVCC-HO-Indication,
RSRVCC-Information,
MDT-PLMN-List,
TunnelInformation,
LHN-ID,
Session-Re-establishment-Indicator,
Additional-CSPS-coordination-information,
UERegistrationQueryResult,
SGSN-Group-Identity,
P-TMSI,
BarometricPressure,
CivicAddress

FROM RANAP-IEs

PrivateIE-Container {},
ProtocolExtensionContainer {},
ProtocolIE-ContainerList {},
ProtocolIE-ContainerPair {},
ProtocolIE-ContainerPairList {},
ProtocolIE-Container {},
RANAP-PRIVATE-IES,
RANAP-PROTOCOL-EXTENSION,
RANAP-PROTOCOL-IES,
RANAP-PROTOCOL-IES-PAIR

FROM RANAP-Containers

maxNrOfDTs,
maxNrOfErrors,
maxNrOfIuSigConIds,
maxNrOfRABs,
maxNrOfVol,
maxnoofMulticastServicesPerUE,

id-AccuracyFulfilmentIndicator,
id-APN,
id-AreaIdentity,
id-Alt-RAB-Parameters,
id-Ass-RAB-Parameters,
id-BroadcastAssistanceDataDecipheringKeys,
id-LocationRelatedDataRequestType,
id-CN-DomainIndicator,
id-Cause,
id-Cell-Access-Mode,
id-ChosenEncryptionAlgorithm,
id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-ClientType,
id-CNMBMSLinkingInformation,
id-CriticalityDiagnostics,

id-CSG-Id,
id-CSG-Id-List,
id-CSG-Membership-Status,
id-DeltaRAListofIdleModeUEs,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-EncryptionKey,
id-ExtendedRNC-ID,
id-FrequenceLayerConvergenceFlag,
id-GERAN-BSC-Container,
id-GERAN-Classmark,
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item,
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse,
id-GlobalCN-ID,
id-GlobalCN-IDCS,
id-GlobalCN-IDPS,
id-GlobalRNC-ID,
id-IncludeVelocity,
id-InformationExchangeID,
id-InformationExchangeType,
id-InformationRequested,
id-InformationRequestType,
id-InformationTransferID,
id-InformationTransferType,
id-IntegrityProtectionInformation,
id-IntegrityProtectionKey,
id-InterSystemInformationTransferType,
id-InterSystemInformation-TransparentContainer,
id-IPMulticastAddress,
id-IuSigConId,
id-OldIuSigConId,
id-OldIuSigConIdCS,
id-OldIuSigConIdPS,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-JoinedMBMSBearerServicesList,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-LeftMBMSBearerServicesList,
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode,
id-MBMSBearerServiceType,
id-MBMSCountingInformation,
id-MBMSCNDe-Registration,
id-MBMSRegistrationRequestType,
id-MBMSynchronisationInformation,
id-MBMSServiceArea,
id-MBMSsessionDuration,
id-MBMSsessionIdentity,

id-MBMSsessionRepetitionNumber,
id-MSISDN,
id-NAS-PDU,
id-NAS-SequenceNumber,
id-NewBSS-To-OldBSS-Information,
id-NonSearchingIndication,
id-NumberOfSteps,
id-Offload-RAB-Parameters,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PDP-TypeInformation,
id-PDP-TypeInformation-extension,
id-PermanentNAS-UE-ID,
id-PositionData,
id-PositionDataSpecificToGERANIuMode,
id-PositioningPriority,
id-ProvidedData,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedList-EnhRelocInfoRes,
id-RAB-FailedItem-EnhRelocInfoRes,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-Parameters,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,

id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupList-EnhRelocInfoReq,
id-RAB-SetupItem-EnhRelocInfoReq,
id-RAB-SetupList-EnhRelocInfoRes,
id-RAB-SetupItem-EnhRelocInfoRes,
id-RAB-SetupList-EnhancedRelocCompleteReq,
id-RAB-SetupItem-EnhancedRelocCompleteReq,
id-RAB-SetupList-EnhancedRelocCompleteRes,
id-RAB-SetupItem-EnhancedRelocCompleteRes,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAB-ToBeReleasedItem-EnhancedRelocCompleteRes,
id-RAB-ToBeReleasedList-EnhancedRelocCompleteRes,
id-RAC,
id-RAListofIdleModeUEs,
id-RAT-Type,
id-RedirectAttemptFlag,
id-RedirectionCompleted,
id-RedirectionIndication,
id-RejectCauseValue,
id-RelocationType,
id-Relocation-SourceRNC-ID,
id-Relocation-SourceExtendedRNC-ID,
id-Relocation-TargetRNC-ID,
id-Relocation-TargetExtendedRNC-ID,
id-RequestedGANSAssistanceData,
id-RequestType,
id-ResponseTime,
id-RSRVCC-Operation-Possible,
id-SAI,
id-SAPI,
id-SelectedPLMN-ID,
id-SessionUpdateID,
id-SNA-Access-Information,
id-SourceBSS-ToTargetBSS-TransparentContainer,
id-SourceRNC-ID,
id-SourceExtendedRNC-ID,
id-SourceID,
id-Source-ToTarget-TransparentContainer,
id-SourceRNC-PDCP-context-info,
id-SRVCC-HO-Indication,
id-SRVCC-Information,
id-SRVCC-Operation-Possible,
id-TargetBSS-ToSourceBSS-TransparentContainer,
id-TargetID,
id-Target-ToSource-TransparentContainer,
id-TemporaryUE-ID,
id-TimeToMBMSDataTransfer,
id-TMGI,

```
id-TracePropagationParameters,  
id-TraceReference,  
id-TraceType,  
id-TransportLayerAddress,  
id-TransportLayerInformation,  
id-TriggerID,  
id-UE-AggregateMaximumBitRate,  
id-UE-ID,  
id-UESBI-Iu,  
id-UL-GTP-PDU-SequenceNumber,  
id-UnsuccessfulLinkingList,  
id-VelocityEstimate,  
id-VerticalAccuracyCode,  
id-VoiceSupportMatchIndicator,  
id-PeriodicLocationInfo,  
id-BroadcastGANSSEncryptionKeys,  
id-SubscriberProfileIDforRFP,  
id-E-UTRAN-Service-Handover,  
id-IP-Source-Address,  
id-LGW-TransportLayerAddress,  
id-Correlation-ID,  
id-MDT-Configuration,  
id-RNSAPRelocationParameters,  
id-RABParametersList,  
id-Priority-Class-Indicator,  
id-Management-Based-MDT-Allowed,  
id-HigherBitratesThan16MbpsFlag,  
id-Trace-Collection-Entity-IP-Address,  
id-End-Of-CSFB,  
id-Out-Of-UTRAN,  
id-RSRVCC-HO-Indication,  
id-RSRVCC-Information,  
id-AnchorPLMN-ID,  
id-Management-Based-MDT-PLMN-List,  
id-Tunnel-Information-for-BBF,  
id-SIPTO-Correlation-ID,  
id-SIPTO-LGW-TransportLayerAddress,  
id-LHN-ID,  
id-LastE-UTRANPLMNIdentity,  
id-Session-Re-establishment-Indicator,  
id-Additional-CSPS-coordination-information,  
id-UERegistrationQueryResult,  
id-IuSigConIdRangeEnd,  
id-SGSN-Group-Identity,  
id-P-TMSI,  
id-RANAP-Message,  
id-PowerSavingIndicator,  
id-BarometricPressure,  
id-CivicAddress
```

```
FROM RANAP-Constants;
```

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

```

-- Common Container Lists
--
-- *****
RAB-IE-ContainerList          { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList    { 1, maxNrOfRABs,
  {IEsSetParam} }
RAB-IE-ContainerPairList     { RANAP-PROTOCOL-IES-PAIR  : IEsSetParam } ::= ProtocolIE-ContainerPairList { 1, maxNrOfRABs,
  {IEsSetParam} }
ProtocolError-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList    { 1, maxNrOfRABs,
  {IEsSetParam} }
IuSigConID-IE-ContainerList  { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList    { 1, maxNrOfIuSigConIDs,
  {IEsSetParam} }
DirectTransfer-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList    { 1, maxNrOfDTs,
  {IEsSetParam} }

-- *****
--
-- Iu RELEASE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Iu Release Command
--
-- *****

Iu-ReleaseCommand ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {Iu-ReleaseCommandIEs} },
  protocolExtensions   ProtocolExtensionContainer { {Iu-ReleaseCommandExtensions} }      OPTIONAL,
  ...
}

Iu-ReleaseCommandIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Cause          CRITICALITY ignore TYPE Cause          PRESENCE mandatory },
  ...
}

Iu-ReleaseCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-End-Of-CSFB          CRITICALITY ignore EXTENSION End-Of-CSFB          PRESENCE optional }|
  { ID id-Out-Of-UTRAN         CRITICALITY ignore EXTENSION Out-Of-UTRAN         PRESENCE optional }|
  { ID id-LastE-UTRANPLMNIdentity CRITICALITY ignore EXTENSION PLMNIdentity     PRESENCE optional },
  ...
}

-- *****
--
-- Iu Release Complete
--
-- *****

Iu-ReleaseComplete ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {Iu-ReleaseCompleteIEs} },
  protocolExtensions   ProtocolExtensionContainer { {Iu-ReleaseCompleteExtensions} }      OPTIONAL,

```

```

}
...
}
Iu-ReleaseCompleteIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-DataVolumeReportList      CRITICALITY ignore  TYPE RAB-DataVolumeReportList      PRESENCE optional } |
  { ID id-RAB-ReleasedList-IuRelComp     CRITICALITY ignore  TYPE RAB-ReleasedList-IuRelComp     PRESENCE optional } |
  { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional  },
  ...
}
RAB-DataVolumeReportList ::= RAB-IE-ContainerList { {RAB-DataVolumeReportItemIEs} }
RAB-DataVolumeReportItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-DataVolumeReportItem      CRITICALITY ignore  TYPE RAB-DataVolumeReportItem      PRESENCE mandatory  },
  ...
}
RAB-DataVolumeReportItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dl-UnsuccessfullyTransmittedDataVolume  DataVolumeList      OPTIONAL
  -- This IE shall always be present although its presence is optional --,
  iE-Extensions         ProtocolExtensionContainer { {RAB-DataVolumeReportItem-ExtIEs} }      OPTIONAL,
  ...
}
RAB-DataVolumeReportItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
RAB-ReleasedList-IuRelComp ::= RAB-IE-ContainerList { {RAB-ReleasedItem-IuRelComp-IEs} }
RAB-ReleasedItem-IuRelComp-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleasedItem-IuRelComp     CRITICALITY ignore  TYPE RAB-ReleasedItem-IuRelComp     PRESENCE mandatory  },
  ...
}
RAB-ReleasedItem-IuRelComp ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dl-GTP-PDU-SequenceNumber  DL-GTP-PDU-SequenceNumber  OPTIONAL,
  ul-GTP-PDU-SequenceNumber  UL-GTP-PDU-SequenceNumber  OPTIONAL,
  iE-Extensions         ProtocolExtensionContainer { {RAB-ReleasedItem-IuRelComp-ExtIEs} }      OPTIONAL,
  ...
}
RAB-ReleasedItem-IuRelComp-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
Iu-ReleaseCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
-- *****

```

```

--
-- RELOCATION PREPARATION ELEMENTARY PROCEDURE
--
-- *****
-- *****
-- Relocation Required
--
-- *****

RelocationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {RelocationRequiredIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RelocationRequiredExtensions} }      OPTIONAL,
    ...
}

RelocationRequiredIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RelocationType          CRITICALITY reject  TYPE RelocationType          PRESENCE mandatory } |
    { ID id-Cause                    CRITICALITY ignore  TYPE Cause                    PRESENCE mandatory } |
    { ID id-SourceID                 CRITICALITY ignore  TYPE SourceID                    PRESENCE mandatory } |
    { ID id-TargetID                 CRITICALITY reject  TYPE TargetID                    PRESENCE mandatory } |
    { ID id-ClassmarkInformation2     CRITICALITY reject  TYPE ClassmarkInformation2       PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a CGI IE and Source BSS To Target BSS Transparent Container is not included -- } |
    { ID id-ClassmarkInformation3     CRITICALITY ignore  TYPE ClassmarkInformation3       PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a CGI IE and Source BSS To Target BSS Transparent Container is not included -- } |
    { ID id-Source-ToTarget-TransparentContainer
      CRITICALITY reject  TYPE Source-ToTarget-TransparentContainer PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a RNC-ID IE or eNB-ID -- } |
    { ID id-OldBSS-ToNewBSS-Information CRITICALITY ignore  TYPE OldBSS-ToNewBSS-Information PRESENCE optional } ,
    ...
}

RelocationRequiredExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark          CRITICALITY ignore  EXTENSION GERAN-Classmark          PRESENCE
optional} |
-- Extension for Release 6 to enable Inter-RAT PS Handover between UTRAN and GERAN A/Gb --
    { ID id-SourceBSS-ToTargetBSS-TransparentContainer CRITICALITY ignore  EXTENSION SourceBSS-ToTargetBSS-TransparentContainer PRESENCE
optional} |
-- Extension for Release 8 for SRVCC operation --
    { ID id-SRVCC-HO-Indication      CRITICALITY reject  EXTENSION SRVCC-HO-Indication      PRESENCE
optional} |
-- Extension for Release 9 to communicate to the CN the CSG id of the target cell --
    { ID id-CSG-Id                   CRITICALITY reject  EXTENSION CSG-Id                   PRESENCE
optional} |
-- Extension for Release 9 to communicate to the CN the hybrid access status of the target cell --
    { ID id-Cell-Access-Mode         CRITICALITY reject  EXTENSION Cell-Access-Mode         PRESENCE
optional} |
-- Extension for Release 11 for rSRVCC operation --
    { ID id-RSRVCC-HO-Indication     CRITICALITY reject  EXTENSION RSRVCC-HO-Indication     PRESENCE
optional},
    ...
}

```

```

-- *****
--
-- Relocation Command
--
-- *****

RelocationCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RelocationCommandIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {RelocationCommandExtensions} }          OPTIONAL,
    ...
}

RelocationCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Target-ToSource-TransparentContainer          CRITICALITY reject  TYPE Target-ToSource-TransparentContainer PRESENCE optional } |
    { ID id-L3-Information                               CRITICALITY ignore  TYPE L3-Information          PRESENCE optional } |
    { ID id-RAB-RelocationReleaseList                   CRITICALITY ignore  TYPE RAB-RelocationReleaseList PRESENCE optional } |
    { ID id-RAB-DataForwardingList                     CRITICALITY ignore  TYPE RAB-DataForwardingList   PRESENCE optional } |
    { ID id-CriticalityDiagnostics                     CRITICALITY ignore  TYPE CriticalityDiagnostics   PRESENCE optional },
    ...
}

RAB-RelocationReleaseList ::= RAB-IE-ContainerList { {RAB-RelocationReleaseItemIEs} }

RAB-RelocationReleaseItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-RelocationReleaseItem                   CRITICALITY ignore  TYPE RAB-RelocationReleaseItem PRESENCE mandatory },
    ...
}

RAB-RelocationReleaseItem ::= SEQUENCE {
    rAB-ID          RAB-ID,
    iE-Extensions   ProtocolExtensionContainer { {RAB-RelocationReleaseItem-ExtIEs} }          OPTIONAL,
    ...
}

RAB-RelocationReleaseItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-DataForwardingList ::= RAB-IE-ContainerList { {RAB-DataForwardingItemIEs} }

RAB-DataForwardingItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingItem                     CRITICALITY ignore  TYPE RAB-DataForwardingItem   PRESENCE mandatory },
    ...
}

RAB-DataForwardingItem ::= SEQUENCE {
    rAB-ID          RAB-ID,
    transportLayerAddress      TransportLayerAddress,
    iuTransportAssociation     IuTransportAssociation,
    iE-Extensions             ProtocolExtensionContainer { {RAB-DataForwardingItem-ExtIEs} }          OPTIONAL,
    ...
}

```

```

RAB-DataForwardingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to allow transfer of a second pair of TLA and association --
    { ID id-TransportLayerAddress    CRITICALITY ignore  EXTENSION TransportLayerAddress PRESENCE optional } |
    { ID id-IuTransportAssociation    CRITICALITY ignore  EXTENSION IuTransportAssociation  PRESENCE optional },
    ...
}

RelocationCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-InterSystemInformation-TransparentContainer CRITICALITY ignore  EXTENSION InterSystemInformation-TransparentContainer PRESENCE optional } |
-- Extension for Release 6 to enable Inter-RAT PS Handover between UTRAN and GERAN A/Gb --
    { ID id-TargetBSS-ToSourceBSS-TransparentContainer CRITICALITY ignore  EXTENSION TargetBSS-ToSourceBSS-TransparentContainer PRESENCE optional } |
-- Extension for Release 8 for SRVCC operation --
    { ID id-SRVCC-Information          CRITICALITY reject  EXTENSION SRVCC-Information          PRESENCE optional } |
-- Extension for Release 11 for rSRVCC operation --
    { ID id-RSRVCC-Information         CRITICALITY reject  EXTENSION RSRVCC-Information         PRESENCE optional },
    ...
}

-- *****
--
-- Relocation Preparation Failure
--
-- *****

RelocationPreparationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RelocationPreparationFailureIEs} },
    protocolExtensions   ProtocolExtensionContainer    { {RelocationPreparationFailureExtensions} }    OPTIONAL,
    ...
}

RelocationPreparationFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore  TYPE Cause          PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

RelocationPreparationFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-InterSystemInformation-TransparentContainer CRITICALITY ignore  EXTENSION InterSystemInformation-TransparentContainer PRESENCE optional },
    ...
}

-- *****
--
-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- *****

```

```

-- *****
--
-- Relocation Request
--
-- *****

RelocationRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RelocationRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {RelocationRequestExtensions} }          OPTIONAL,
    ...
}

RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore TYPE PermanentNAS-UE-ID          PRESENCE optional } |
    { ID id-Cause                        CRITICALITY ignore TYPE Cause                    PRESENCE mandatory } |
    { ID id-CN-DomainIndicator           CRITICALITY reject TYPE CN-DomainIndicator     PRESENCE mandatory } |
    { ID id-Source-ToTarget-TransparentContainer CRITICALITY reject TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE mandatory } |
    { ID id-RAB-SetupList-RelocReq       CRITICALITY reject TYPE RAB-SetupList-RelocReq   PRESENCE optional } |
    { ID id-IntegrityProtectionInformation CRITICALITY ignore TYPE IntegrityProtectionInformation PRESENCE optional } |
    { ID id-EncryptionInformation        CRITICALITY ignore TYPE EncryptionInformation     PRESENCE optional } |
    { ID id-IuSigConId                   CRITICALITY ignore TYPE IuSignallingConnectionIdentifier PRESENCE mandatory },
    ...
}

RAB-SetupList-RelocReq ::= RAB-IE-ContainerList { {RAB-SetupItem-RelocReq-IEs} }

RAB-SetupItem-RelocReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-RelocReq       CRITICALITY reject TYPE RAB-SetupItem-RelocReq   PRESENCE mandatory },
    ...
}

RAB-SetupItem-RelocReq ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    nAS-SynchronisationIndicator NAS-SynchronisationIndicator OPTIONAL,
    rAB-Parameters              RAB-Parameters,
    dataVolumeReportingIndication DataVolumeReportingIndication OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    pDP-TypeInformation          PDP-TypeInformation OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    userPlaneInformation         UserPlaneInformation,
    transportLayerAddress        TransportLayerAddress,
    iuTransportAssociation        IuTransportAssociation,
    service-Handover             Service-Handover OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { {RAB-SetupItem-RelocReq-ExtIEs} }          OPTIONAL,
    ...
}

RAB-SetupItem-RelocReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    { ID id-Alt-RAB-Parameters          CRITICALITY ignore EXTENSION Alt-RAB-Parameters PRESENCE optional}|
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-BSC-Container         CRITICALITY ignore EXTENSION GERAN-BSC-Container PRESENCE optional}|
}

```

```

-- Extension for Release 8 to enable handover restriction to E-UTRAN --
  { ID id-E-UTRAN-Service-Handover      CRITICALITY ignore  EXTENSION E-UTRAN-Service-Handover      PRESENCE optional}|
-- Extension for Release 9 to enable a new value --
  { ID id-PDP-TypeInformation-extension  CRITICALITY ignore  EXTENSION PDP-TypeInformation-extension  PRESENCE optional}|
-- Extension for Release 10 to enable offload at Iu-PS for UTRAN --
  { ID id-Offload-RAB-Parameters        CRITICALITY ignore  EXTENSION Offload-RAB-Parameters        PRESENCE optional},
  ...
}

UserPlaneInformation ::= SEQUENCE {
  userPlaneMode          UserPlaneMode,
  uP-ModeVersions        UP-ModeVersions,
  iE-Extensions          ProtocolExtensionContainer { {UserPlaneInformation-ExtIEs} }      OPTIONAL,
  ...
}

UserPlaneInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RelocationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
  { ID id-GlobalCN-ID          CRITICALITY reject  EXTENSION GlobalCN-ID          PRESENCE optional}|
-- Extension for Release 5 to enable shared networks in connected mode --
  { ID id-SNA-Access-Information CRITICALITY ignore  EXTENSION SNA-Access-Information PRESENCE optional}|
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE handling --
  { ID id-UESBI-Iu             CRITICALITY ignore  EXTENSION UESBI-Iu             PRESENCE optional}|
-- Extension for Release 6 to convey the selected PLMN id in network sharing mobility scenarios --
  { ID id-SelectedPLMN-ID      CRITICALITY ignore  EXTENSION PLMNidentity         PRESENCE optional}|
-- Extension for Release 6 to enable MBMS UE linking at relocation --
  { ID id-CNMBMSLinkingInformation CRITICALITY ignore  EXTENSION CNMBMSLinkingInformation PRESENCE optional}|
  { ID id-UE-AggregateMaximumBitRate CRITICALITY ignore  EXTENSION UE-AggregateMaximumBitRate PRESENCE optional}|
-- Extension for Release 9 to communicate to the target cell the CSG id reported by the source --
  { ID id-CSG-Id               CRITICALITY reject  EXTENSION CSG-Id               PRESENCE optional}|
-- Extension for Release 9 for enabling UE prioritisation during access to hybrid cells --
  { ID id-CSG-Membership-Status CRITICALITY ignore  EXTENSION CSG-Membership-Status PRESENCE optional}|
-- Extension for Release 10 to enable offload at Iu-PS for UTRAN --
  { ID id-MSISDN               CRITICALITY ignore  EXTENSION MSISDN               PRESENCE optional}|
-- Extension for Release 11 to support rSRVCC in case of network sharing -
  { ID id-AnchorPLMN-ID        CRITICALITY ignore  EXTENSION PLMNidentity         PRESENCE optional}|
  { ID id-PowerSavingIndicator  CRITICALITY ignore  EXTENSION PowerSavingIndicator  PRESENCE optional},
  ...
}

CNMBMSLinkingInformation ::= SEQUENCE {
  joinedMBMSBearerService-IEs  JoinedMBMSBearerService-IEs,
  iE-Extensions                ProtocolExtensionContainer { {CNMBMSLinkingInformation-ExtIEs} }      OPTIONAL,
  ...
}

CNMBMSLinkingInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

```

```

JoinedMBMSBearerService-IEs ::= SEQUENCE (SIZE (1.. maxnoofMulticastServicesPerUE)) OF
  SEQUENCE {
    tMGI                TMGI,
    mBMS-PTP-RAB-ID    MBMS-PTP-RAB-ID,
    iE-Extensions      ProtocolExtensionContainer { {JoinedMBMSBearerService-ExtIEs} } OPTIONAL,
    ...
  }

JoinedMBMSBearerService-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- Relocation Request Acknowledge
--
-- *****

RelocationRequestAcknowledge ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {RelocationRequestAcknowledgeIEs} },
  protocolExtensions  ProtocolExtensionContainer { {RelocationRequestAcknowledgeExtensions} } OPTIONAL,
  ...
}

RelocationRequestAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Target-ToSource-TransparentContainer
    CRITICALITY ignore TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE optional } |
  { ID id-RAB-SetupList-RelocReqAck          CRITICALITY ignore TYPE RAB-SetupList-RelocReqAck          PRESENCE optional } |
  { ID id-RAB-FailedList                    CRITICALITY ignore TYPE RAB-FailedList                    PRESENCE optional } |
  { ID id-ChosenIntegrityProtectionAlgorithm CRITICALITY ignore TYPE ChosenIntegrityProtectionAlgorithm PRESENCE optional } |
  { ID id-ChosenEncryptionAlgorithm         CRITICALITY ignore TYPE ChosenEncryptionAlgorithm         PRESENCE optional } |
  { ID id-CriticalityDiagnostics            CRITICALITY ignore TYPE CriticalityDiagnostics            PRESENCE optional },
  ...
}

RAB-SetupList-RelocReqAck          ::= RAB-IE-ContainerList { {RAB-SetupItem-RelocReqAck-IEs} }

RAB-SetupItem-RelocReqAck-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupItem-RelocReqAck          CRITICALITY reject TYPE RAB-SetupItem-RelocReqAck          PRESENCE mandatory },
  ...
}

RAB-SetupItem-RelocReqAck ::= SEQUENCE {
  rAB-ID                RAB-ID,
  transportLayerAddress TransportLayerAddress OPTIONAL,
  iuTransportAssociation IuTransportAssociation OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { {RAB-SetupItem-RelocReqAck-ExtIEs} } OPTIONAL,
  ...
}

RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
  {ID id-Ass-RAB-Parameters CRITICALITY ignore EXTENSION Ass-RAB-Parameters PRESENCE optional } |
-- Extension for Release 5 to allow transfer of a second pair of TLA and association --

```

```

    {ID id-TransportLayerAddress    CRITICALITY ignore  EXTENSION TransportLayerAddress PRESENCE optional} |
    {ID id-IuTransportAssociation    CRITICALITY ignore  EXTENSION IuTransportAssociation  PRESENCE optional},
    ...
}

RAB-FailedList ::= RAB-IE-ContainerList { {RAB-FailedItemIEs} }

RAB-FailedItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-FailedItem          CRITICALITY ignore  TYPE RAB-FailedItem          PRESENCE mandatory },
    ...
}

RAB-FailedItem ::= SEQUENCE {
    rAB-ID                RAB-ID,
    cause                 Cause,
    iE-Extensions         ProtocolExtensionContainer { {RAB-FailedItem-ExtIEs} }      OPTIONAL,
    ...
}

RAB-FailedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RelocationRequestAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    {ID id-NewBSS-To-OldBSS-Information CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-Information  PRESENCE optional }|
    {ID id-CSG-Id                      CRITICALITY ignore  EXTENSION CSG-Id                      PRESENCE optional },
    ...
}

-- *****
--
-- Relocation Failure
--
-- *****

RelocationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {RelocationFailureIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RelocationFailureExtensions} }      OPTIONAL,
    ...
}

RelocationFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore  TYPE Cause          PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

RelocationFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-NewBSS-To-OldBSS-Information CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-Information  PRESENCE optional } |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark CRITICALITY ignore  EXTENSION GERAN-Classmark          PRESENCE optional },
    ...
}

```

```

}
-- *****
--
-- RELOCATION CANCEL ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Relocation Cancel
--
-- *****

RelocationCancel ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RelocationCancelIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {RelocationCancelExtensions} }          OPTIONAL,
    ...
}

RelocationCancelIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore TYPE Cause          PRESENCE mandatory },
    ...
}

RelocationCancelExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Relocation Cancel Acknowledge
--
-- *****

RelocationCancelAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RelocationCancelAcknowledgeIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {RelocationCancelAcknowledgeExtensions} }          OPTIONAL,
    ...
}

RelocationCancelAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

RelocationCancelAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- SRNS CONTEXT TRANSFER OPERATION
--

```

```

-- *****
-- *****
--
-- SRNS Context Request
--
-- *****

SRNS-ContextRequest ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {SRNS-ContextRequestIEs} },
    protocolExtensions ProtocolExtensionContainer { {SRNS-ContextRequestExtensions} }      OPTIONAL,
    ...
}

SRNS-ContextRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingList-SRNS-CtxReq CRITICALITY ignore TYPE RAB-DataForwardingList-SRNS-CtxReq PRESENCE mandatory },
    ...
}

RAB-DataForwardingList-SRNS-CtxReq ::= RAB-IE-ContainerList { {RAB-DataForwardingItem-SRNS-CtxReq-IEs} }

RAB-DataForwardingItem-SRNS-CtxReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingItem-SRNS-CtxReq CRITICALITY reject TYPE RAB-DataForwardingItem-SRNS-CtxReq PRESENCE mandatory },
    ...
}

RAB-DataForwardingItem-SRNS-CtxReq ::= SEQUENCE {
    rAB-ID          RAB-ID,
    iE-Extensions  ProtocolExtensionContainer { {RAB-DataForwardingItem-SRNS-CtxReq-ExtIEs} }      OPTIONAL,
    ...
}

RAB-DataForwardingItem-SRNS-CtxReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRNS-ContextRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- The SGSN may include the IE, when available to indicate the RAT from which the context request originates, to correct measurement points in
SRNC. --
    {ID id-RAT-Type CRITICALITY ignore EXTENSION RAT-Type PRESENCE optional },
    ...
}

-- *****
--
-- SRNS Context Response
--
-- *****

SRNS-ContextResponse ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {SRNS-ContextResponseIEs} },
    protocolExtensions ProtocolExtensionContainer { {SRNS-ContextResponseExtensions} }      OPTIONAL,
    ...
}

```

```

SRNS-ContextResponseIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ContextList          CRITICALITY ignore TYPE RAB-ContextList          PRESENCE optional } |
  { ID id-RAB-ContextFailedtoTransferList  CRITICALITY ignore TYPE RAB-ContextFailedtoTransferList  PRESENCE optional } |
  { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics          PRESENCE optional },
  ...
}

RAB-ContextList ::= RAB-IE-ContainerList { {RAB-ContextItemIEs} }

RAB-ContextItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ContextItem          CRITICALITY ignore TYPE RAB-ContextItem          PRESENCE mandatory },
  ...
}

RAB-ContextItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dl-GTP-PDU-SequenceNumber  DL-GTP-PDU-SequenceNumber  OPTIONAL,
  ul-GTP-PDU-SequenceNumber  UL-GTP-PDU-SequenceNumber  OPTIONAL,
  dl-N-PDU-SequenceNumber    DL-N-PDU-SequenceNumber    OPTIONAL,
  ul-N-PDU-SequenceNumber    UL-N-PDU-SequenceNumber    OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs} }  OPTIONAL,
  ...
}

RAB-ContextItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-ContextFailedtoTransferList ::= RAB-IE-ContainerList { {RABs-ContextFailedtoTransferItemIEs} }

RABs-ContextFailedtoTransferItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ContextFailedtoTransferItem  CRITICALITY ignore TYPE RABs-ContextFailedtoTransferItem  PRESENCE mandatory },
  ...
}

RABs-ContextFailedtoTransferItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  cause                 Cause,
  iE-Extensions          ProtocolExtensionContainer { { RABs-ContextFailedtoTransferItem-ExtIEs} }  OPTIONAL,
  ...
}

RABs-ContextFailedtoTransferItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

SRNS-ContextResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--

```

```

-- SECURITY MODE CONTROL ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Security Mode Command
--
-- *****

SecurityModeCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {SecurityModeCommandIEs} },
    protocolExtensions    ProtocolExtensionContainer { {SecurityModeCommandExtensions} }          OPTIONAL,
    ...
}

SecurityModeCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IntegrityProtectionInformation    CRITICALITY reject    TYPE IntegrityProtectionInformation    PRESENCE mandatory } |
    { ID id-EncryptionInformation            CRITICALITY ignore    TYPE EncryptionInformation            PRESENCE optional } |
    { ID id-KeyStatus                        CRITICALITY reject    TYPE KeyStatus                        PRESENCE mandatory},
    ...
}

SecurityModeCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Security Mode Complete
--
-- *****

SecurityModeComplete ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {SecurityModeCompleteIEs} },
    protocolExtensions    ProtocolExtensionContainer { {SecurityModeCompleteExtensions} }          OPTIONAL,
    ...
}

SecurityModeCompleteIEs RANAP-PROTOCOL-IES ::= {
    { ID id-ChosenIntegrityProtectionAlgorithm    CRITICALITY reject    TYPE ChosenIntegrityProtectionAlgorithm    PRESENCE mandatory } |
    { ID id-ChosenEncryptionAlgorithm            CRITICALITY ignore    TYPE ChosenEncryptionAlgorithm            PRESENCE optional } |
    { ID id-CriticalityDiagnostics                CRITICALITY ignore    TYPE CriticalityDiagnostics                PRESENCE optional },
    ...
}

SecurityModeCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Security Mode Reject
--
-- *****

```

```

-- *****
SecurityModeReject ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {SecurityModeRejectIEs} },
    protocolExtensions   ProtocolExtensionContainer { {SecurityModeRejectExtensions} }      OPTIONAL,
    ...
}

SecurityModeRejectIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore TYPE Cause          PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

SecurityModeRejectExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- DATA VOLUME REPORT ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Data Volume Report Request
--
-- *****

DataVolumeReportRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {DataVolumeReportRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer { {DataVolumeReportRequestExtensions} }      OPTIONAL,
    ...
}

DataVolumeReportRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportRequestList CRITICALITY ignore TYPE RAB-DataVolumeReportRequestList PRESENCE mandatory },
    ...
}

RAB-DataVolumeReportRequestList ::= RAB-IE-ContainerList { {RAB-DataVolumeReportRequestItemIEs} }

RAB-DataVolumeReportRequestItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportRequestItem CRITICALITY reject TYPE RAB-DataVolumeReportRequestItem PRESENCE mandatory },
    ...
}

RAB-DataVolumeReportRequestItem ::= SEQUENCE {
    rAB-ID                RAB-ID,
    iE-Extensions         ProtocolExtensionContainer { {RAB-DataVolumeReportRequestItem-ExtIEs} }      OPTIONAL,
    ...
}

```

```

RAB-DataVolumeReportRequestItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

DataVolumeReportRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Data Volume Report
--
-- *****

DataVolumeReport ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {DataVolumeReportIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {DataVolumeReportExtensions} }          OPTIONAL,
    ...
}

DataVolumeReportIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportList          CRITICALITY ignore TYPE RAB-DataVolumeReportList          PRESENCE optional } |
    { ID id-RAB-FailedtoReportList           CRITICALITY ignore TYPE RAB-FailedtoReportList           PRESENCE optional } |
    { ID id-CriticalityDiagnostics           CRITICALITY ignore TYPE CriticalityDiagnostics           PRESENCE optional },
    ...
}

DataVolumeReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-FailedtoReportList ::= RAB-IE-ContainerList { {RABs-failed-to-reportItemIEs} }

RABs-failed-to-reportItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-FailedtoReportItem          CRITICALITY ignore TYPE RABs-failed-to-reportItem          PRESENCE mandatory },
    ...
}

RABs-failed-to-reportItem ::= SEQUENCE {
    rAB-ID          RAB-ID,
    cause           Cause,
    iE-Extensions   ProtocolExtensionContainer { { RABs-failed-to-reportItem-ExtIEs } }          OPTIONAL,
    ...
}

RABs-failed-to-reportItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- RESET ELEMENTARY PROCEDURE

```

```

--
-- *****
-- *****
--
-- Reset
--
-- *****

Reset ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ResetIEs} },
    protocolExtensions   ProtocolExtensionContainer { {ResetExtensions} }          OPTIONAL,
    ...
}

ResetIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore  TYPE Cause          PRESENCE mandatory } |
    { ID id-CN-DomainIndicator CRITICALITY reject TYPE CN-DomainIndicator PRESENCE mandatory } |
    { ID id-GlobalRNC-ID    CRITICALITY ignore  TYPE GlobalRNC-ID    PRESENCE optional },
    ...
}

ResetExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID          CRITICALITY ignore      EXTENSION GlobalCN-ID          PRESENCE optional } |
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID      CRITICALITY reject   EXTENSION ExtendedRNC-ID      PRESENCE optional },
    ...
}

-- *****
--
-- Reset Acknowledge
--
-- *****

ResetAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ResetAcknowledgeIEs} },
    protocolExtensions   ProtocolExtensionContainer { {ResetAcknowledgeExtensions} }          OPTIONAL,
    ...
}

ResetAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator CRITICALITY reject TYPE CN-DomainIndicator PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional } |
    { ID id-GlobalRNC-ID      CRITICALITY ignore  TYPE GlobalRNC-ID      PRESENCE optional },
    ...
}

ResetAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID          CRITICALITY ignore      EXTENSION GlobalCN-ID          PRESENCE optional } |
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID      CRITICALITY reject   EXTENSION ExtendedRNC-ID      PRESENCE optional },
}

```

```

    ...
}
-- *****
--
-- RESET RESOURCE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Reset Resource
--
-- *****

ResetResource ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ResetResourceIEs} },
    protocolExtensions   ProtocolExtensionContainer { {ResetResourceExtensions} }          OPTIONAL,
    ...
}

ResetResourceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator      CRITICALITY reject TYPE CN-DomainIndicator      PRESENCE mandatory } |
    { ID id-Cause                   CRITICALITY ignore TYPE Cause                   PRESENCE mandatory } |
    { ID id-IuSigConIdList          CRITICALITY ignore TYPE ResetResourceList     PRESENCE mandatory } |
    { ID id-GlobalRNC-ID            CRITICALITY ignore TYPE GlobalRNC-ID            PRESENCE optional },
    ...
}

ResetResourceList ::= IuSigConId-IE-ContainerList{ {ResetResourceItemIEs} }

ResetResourceItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem          CRITICALITY reject TYPE ResetResourceItem      PRESENCE mandatory },
    ...
}

ResetResourceItem ::= SEQUENCE {
    iuSigConId                    IuSignallingConnectionIdentifier,
    iE-Extensions                  ProtocolExtensionContainer { { ResetResourceItem-ExtIEs} }          OPTIONAL,
    ...
}

ResetResourceItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-IuSigConIdRangeEnd      CRITICALITY reject EXTENSION IuSignallingConnectionIdentifier PRESENCE optional},
    ...
}

ResetResourceExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID            CRITICALITY ignore EXTENSION GlobalCN-ID            PRESENCE optional}|
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID        CRITICALITY reject EXTENSION ExtendedRNC-ID        PRESENCE optional },
    ...
}

```

```

-- *****
--
-- Reset Resource Acknowledge
--
-- *****

ResetResourceAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ResetResourceAcknowledgeIEs} },
    protocolExtensions   ProtocolExtensionContainer { {ResetResourceAcknowledgeExtensions} }    OPTIONAL,
    ...
}

ResetResourceAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator          PRESENCE mandatory } |
    { ID id-IuSigConIdList              CRITICALITY ignore TYPE ResetResourceAckList          PRESENCE mandatory } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore TYPE GlobalRNC-ID                PRESENCE optional } |
    { ID id-CriticalityDiagnostics      CRITICALITY ignore TYPE CriticalityDiagnostics      PRESENCE optional },
    ...
}

ResetResourceAckList ::= IuSigConId-IE-ContainerList{ {ResetResourceAckItemIEs} }

ResetResourceAckItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem              CRITICALITY reject  TYPE      ResetResourceAckItem          PRESENCE mandatory },
    ...
}

ResetResourceAckItem ::= SEQUENCE {
    iuSigConId          IuSignallingConnectionIdentifier,
    IE-Extensions       ProtocolExtensionContainer { { ResetResourceAckItem-ExtIEs} }    OPTIONAL,
    ...
}

ResetResourceAckItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-IuSigConIdRangeEnd          CRITICALITY ignore  EXTENSION IuSignallingConnectionIdentifier  PRESENCE optional},
    ...
}

ResetResourceAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID                CRITICALITY ignore  EXTENSION GlobalCN-ID                PRESENCE optional}|
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID            CRITICALITY reject  EXTENSION ExtendedRNC-ID            PRESENCE optional},
    ...
}

-- *****
--
-- RAB RELEASE REQUEST ELEMENTARY PROCEDURE
--
-- *****
-- *****
--

```

```

-- RAB Release Request
--
-- *****
RAB-ReleaseRequest ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { {RAB-ReleaseRequestIEs} },
  protocolExtensions ProtocolExtensionContainer { {RAB-ReleaseRequestExtensions} }      OPTIONAL,
  ...
}

RAB-ReleaseRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleaseList      CRITICALITY ignore TYPE RAB-ReleaseList      PRESENCE mandatory },
  ...
}

RAB-ReleaseList ::= RAB-IE-ContainerList { {RAB-ReleaseItemIEs} }

RAB-ReleaseItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleaseItem      CRITICALITY ignore TYPE RAB-ReleaseItem      PRESENCE mandatory },
  ...
}

RAB-ReleaseItem ::= SEQUENCE {
  rAB-ID          RAB-ID,
  cause          Cause,
  iE-Extensions  ProtocolExtensionContainer { {RAB-ReleaseItem-ExtIEs} }      OPTIONAL,
  ...
}

RAB-ReleaseItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-ReleaseRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- Iu RELEASE REQUEST ELEMENTARY PROCEDURE
--
-- *****
--
-- Iu Release Request
--
-- *****

Iu-ReleaseRequest ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { {Iu-ReleaseRequestIEs} },
  protocolExtensions ProtocolExtensionContainer { {Iu-ReleaseRequestExtensions} }      OPTIONAL,
  ...
}

```

```

Iu-ReleaseRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Cause          CRITICALITY ignore  TYPE Cause          PRESENCE mandatory },
  ...
}

Iu-ReleaseRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- RELOCATION DETECT ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Relocation Detect
--
-- *****

RelocationDetect ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { {RelocationDetectIEs} },
  protocolExtensions   ProtocolExtensionContainer { {RelocationDetectExtensions} }      OPTIONAL,
  ...
}

RelocationDetectIEs RANAP-PROTOCOL-IES ::= {
  ...
}

RelocationDetectExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- RELOCATION COMPLETE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Relocation Complete
--
-- *****

RelocationComplete ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { {RelocationCompleteIEs} },
  protocolExtensions   ProtocolExtensionContainer { {RelocationCompleteExtensions} }      OPTIONAL,
  ...
}

```

```
RelocationCompleteIEs RANAP-PROTOCOL-IES ::= {
    ...
}
```

```
RelocationCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 9 to enable the CN to handle potential UE NAS QoS issues related to higher bitrates --
  { ID id-HigherBitratesThan16MbpsFlag          CRITICALITY ignore  EXTENSION HigherBitratesThan16MbpsFlag  PRESENCE optional} |
-- Extension for Release 11 to support BBAI --
  { ID id-Tunnel-Information-for-BBF           CRITICALITY ignore  EXTENSION TunnelInformation          PRESENCE optional} |
-- Extension for Release 12 to support SIPTO@LN Stand-Alone --
  { ID id-LHN-ID                               CRITICALITY ignore  EXTENSION LHN-ID                    PRESENCE optional},
  ...
}
```

```
-- *****
--
-- ENHANCED RELOCATION COMPLETE ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Enhanced Relocation Complete Request
--
-- *****
```

```
EnhancedRelocationCompleteRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { EnhancedRelocationCompleteRequestIEs } },
    protocolExtensions   ProtocolExtensionContainer   { { EnhancedRelocationCompleteRequestExtensions } }        OPTIONAL,
    ...
}
```

```
EnhancedRelocationCompleteRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-OldIuSigConId          CRITICALITY reject  TYPE IuSignallingConnectionIdentifier  PRESENCE mandatory } |
  { ID id-IuSigConId             CRITICALITY reject  TYPE IuSignallingConnectionIdentifier  PRESENCE mandatory } |
  { ID id-Relocation-SourceRNC-ID CRITICALITY ignore  TYPE GlobalRNC-ID                     PRESENCE mandatory } |
  { ID id-Relocation-SourceExtendedRNC-ID CRITICALITY ignore  TYPE ExtendedRNC-ID                   PRESENCE optional } |
  { ID id-Relocation-TargetRNC-ID CRITICALITY reject  TYPE GlobalRNC-ID                     PRESENCE mandatory } |
  { ID id-Relocation-TargetExtendedRNC-ID CRITICALITY reject  TYPE ExtendedRNC-ID                   PRESENCE optional } |
  { ID id-RAB-SetupList-EnhancedRelocCompleteReq CRITICALITY reject  TYPE RAB-SetupList-EnhancedRelocCompleteReq PRESENCE optional },
  ...
}
```

```
RAB-SetupList-EnhancedRelocCompleteReq ::= RAB-IE-ContainerList { { RAB-SetupItem-EnhancedRelocCompleteReq-IEs } }
```

```
RAB-SetupItem-EnhancedRelocCompleteReq-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupItem-EnhancedRelocCompleteReq CRITICALITY reject  TYPE RAB-SetupItem-EnhancedRelocCompleteReq PRESENCE mandatory },
  ...
}
```

```
RAB-SetupItem-EnhancedRelocCompleteReq ::= SEQUENCE {
  rAB-ID          RAB-ID,
  transportLayerAddressReq1 TransportLayerAddress OPTIONAL,
```

```

    IuTransportAssociationReq1      IuTransportAssociation OPTIONAL,
    Ass-RAB-Parameters              Ass-RAB-Parameters OPTIONAL,
    IE-Extensions                   ProtocolExtensionContainer { { RAB-SetupItem-EnhancedRelocCompleteReq-ExtIEs } } OPTIONAL,
    ...
}

RAB-SetupItem-EnhancedRelocCompleteReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

EnhancedRelocationCompleteRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-ChosenIntegrityProtectionAlgorithm CRITICALITY ignore EXTENSION ChosenIntegrityProtectionAlgorithm PRESENCE optional} |
    { ID id-ChosenEncryptionAlgorithm          CRITICALITY ignore EXTENSION ChosenEncryptionAlgorithm          PRESENCE optional} |
    -- Extension for Release 9 to enable the CN to handle potential UE NAS QoS issues related to higher bitrates --
    { ID id-HigherBitratesThan16MbpsFlag       CRITICALITY ignore EXTENSION HigherBitratesThan16MbpsFlag       PRESENCE optional} |
    -- Extensions for Release 11 to enable enhanced relocation from RNC to hybrid cell -
    { ID id-CSG-Id                             CRITICALITY reject  EXTENSION CSG-Id                             PRESENCE optional} |
    { ID id-Cell-Access-Mode                   CRITICALITY reject  EXTENSION Cell-Access-Mode                   PRESENCE optional} |
    -- Extension for Release 11 to support BBAI --
    { ID id-Tunnel-Information-for-BBF         CRITICALITY ignore  EXTENSION TunnelInformation                     PRESENCE optional} |
    -- Extension for Release 12 to support SIPTO@LN Stand-Alone --
    { ID id-LHN-ID                             CRITICALITY ignore  EXTENSION LHN-ID                             PRESENCE optional},
    ...
}

-- *****
--
-- Enhanced Relocation Complete Response
--
-- *****

EnhancedRelocationCompleteResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {EnhancedRelocationCompleteResponseIEs} },
    protocolExtensions  ProtocolExtensionContainer { {EnhancedRelocationCompleteResponseExtensions} } OPTIONAL,
    ...
}

EnhancedRelocationCompleteResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupList-EnhancedRelocCompleteRes CRITICALITY ignore TYPE RAB-SetupList-EnhancedRelocCompleteRes PRESENCE optional} |
    { ID id-RAB-ToBeReleasedList-EnhancedRelocCompleteRes CRITICALITY ignore TYPE RAB-ToBeReleasedList-EnhancedRelocCompleteRes PRESENCE optional} |
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

RAB-SetupList-EnhancedRelocCompleteRes ::= RAB-IE-ContainerList { {RAB-SetupItem-EnhancedRelocCompleteRes-IEs} }

RAB-SetupItem-EnhancedRelocCompleteRes-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-EnhancedRelocCompleteRes CRITICALITY reject TYPE RAB-SetupItem-EnhancedRelocCompleteRes PRESENCE mandatory },
    ...
}

RAB-SetupItem-EnhancedRelocCompleteRes ::= SEQUENCE {
    rAB-ID RAB-ID,

```

```

    rAB-Parameters            RAB-Parameters OPTIONAL,
    userPlaneInformation      UserPlaneInformation,
    transportLayerAddressRes1 TransportLayerAddress OPTIONAL,
    iuTransportAssociationRes1 IuTransportAssociation OPTIONAL,
    rab2beReleasedList        RAB-ToBeReleasedList-EnhancedRelocCompleteRes OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { RAB-SetupItem-EnhancedRelocCompleteRes-ExtIEs } } OPTIONAL,
    ...
}

RAB-SetupItem-EnhancedRelocCompleteRes-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  -- Extension for Release 10 to enable Offload at Iu-ps for UTRAN --
  { ID id-Offload-RAB-Parameters          CRITICALITY ignore EXTENSION Offload-RAB-Parameters          PRESENCE optional},
  ...
}

RAB-ToBeReleasedList-EnhancedRelocCompleteRes ::= RAB-IE-ContainerList { {RAB-ToBeReleasedItem-EnhancedRelocCompleteRes-IEs} }

RAB-ToBeReleasedItem-EnhancedRelocCompleteRes-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ToBeReleasedItem-EnhancedRelocCompleteRes          CRITICALITY ignore TYPE RAB-ToBeReleasedItem-EnhancedRelocCompleteRes          PRESENCE
  mandatory },
  ...
}

RAB-ToBeReleasedItem-EnhancedRelocCompleteRes ::= SEQUENCE {
  rAB-ID                RAB-ID,
  cause                  Cause,
  iE-Extensions          ProtocolExtensionContainer { { RAB-ToBeReleasedItem-EnhancedRelocCompleteRes-ExtIEs } } OPTIONAL,
  ...
}

RAB-ToBeReleasedItem-EnhancedRelocCompleteRes-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

EnhancedRelocationCompleteResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-UE-AggregateMaximumBitRate          CRITICALITY ignore EXTENSION UE-AggregateMaximumBitRate PRESENCE optional}|
  -- Extension for Release 10 to enable Offload at Iu-ps for UTRAN --
  { ID id-MSISDN                CRITICALITY ignore EXTENSION MSISDN                PRESENCE optional}|
  -- Extension for Release 11 to enable enhanced relocation from RNC to hybrid cell -
  { ID id-CSG-Membership-Status          CRITICALITY ignore EXTENSION CSG-Membership-Status          PRESENCE optional},
  ...
}

-- *****
--
-- Enhanced Relocation Complete Failure
--
-- *****

EnhancedRelocationCompleteFailure ::= SEQUENCE {
  protocolIEs              ProtocolIE-Container          { {EnhancedRelocationCompleteFailureIEs} },
  protocolExtensions        ProtocolExtensionContainer { {EnhancedRelocationCompleteFailureExtensions} } OPTIONAL,
  ...
}

```

```

EnhancedRelocationCompleteFailureIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Cause          CRITICALITY ignore TYPE Cause          PRESENCE mandatory } |
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

EnhancedRelocationCompleteFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- Enhanced Relocation Complete Confirm
--
-- *****

EnhancedRelocationCompleteConfirm ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {EnhancedRelocationCompleteConfirmIEs} },
  protocolExtensions   ProtocolExtensionContainer   { {EnhancedRelocationCompleteConfirmExtensions} } OPTIONAL,
  ...
}

EnhancedRelocationCompleteConfirmIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-FailedList CRITICALITY ignore TYPE RAB-FailedList PRESENCE optional },
  ...
}

EnhancedRelocationCompleteConfirmExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- PAGING ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Paging
--
-- *****

Paging ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {PagingIEs} },
  protocolExtensions   ProtocolExtensionContainer   { {PagingExtensions} } OPTIONAL,
  ...
}

PagingIEs RANAP-PROTOCOL-IES ::= {
  { ID id-CN-DomainIndicator CRITICALITY ignore TYPE CN-DomainIndicator PRESENCE mandatory } |
  { ID id-PermanentNAS-UE-ID CRITICALITY ignore TYPE PermanentNAS-UE-ID PRESENCE mandatory } |

```

```
{ ID id-TemporaryUE-ID           CRITICALITY ignore TYPE TemporaryUE-ID           PRESENCE optional } |
{ ID id-PagingAreaID             CRITICALITY ignore TYPE PagingAreaID             PRESENCE optional } |
{ ID id-PagingCause              CRITICALITY ignore TYPE PagingCause              PRESENCE optional } |
{ ID id-NonSearchingIndication    CRITICALITY ignore TYPE NonSearchingIndication    PRESENCE optional } |
{ ID id-DRX-CycleLengthCoefficient CRITICALITY ignore TYPE DRX-CycleLengthCoefficient    PRESENCE optional } ,
...
}

PagingExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable NNSF --
  { ID id-GlobalCN-ID             CRITICALITY ignore EXTENSION GlobalCN-ID             PRESENCE optional } |
-- Extension for Release 8 to support CSG --
  { ID id-CSG-Id-List            CRITICALITY ignore EXTENSION CSG-Id-List            PRESENCE optional } ,
...
}

-- *****
--
-- COMMON ID ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Common ID
--
-- *****

CommonID ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {CommonID-IEs} },
  protocolExtensions   ProtocolExtensionContainer    { {CommonIDExtensions} }           OPTIONAL,
  ...
}

CommonID-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-PermanentNAS-UE-ID      CRITICALITY ignore TYPE PermanentNAS-UE-ID          PRESENCE mandatory } ,
  ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable shared networks in connected mode --
  { ID id-SNA-Access-Information   CRITICALITY ignore EXTENSION SNA-Access-Information   PRESENCE optional } |
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE handling --
  { ID id-UESBI-Iu                 CRITICALITY ignore EXTENSION UESBI-Iu                 PRESENCE optional } |
-- Extension for Release 6 to indicate the selected plmn in GWCN configuration for network sharing non-supporting UEs --
  { ID id-SelectedPLMN-ID         CRITICALITY ignore EXTENSION PLMNidentity           PRESENCE optional } |
-- Extension for Release 8 to indicate the Subscriber Profile ID for RAT/Frequency Selection Priority --
  { ID id-SubscriberProfileIDforRFP CRITICALITY ignore EXTENSION SubscriberProfileIDforRFP PRESENCE optional } |
-- Extension for Release 8 for SRVCC operation --
  { ID id-SRVCC-Operation-Possible CRITICALITY ignore EXTENSION SRVCC-Operation-Possible PRESENCE optional } |
-- Extension for Release 9 to allow for UE prioritisation during access to hybrid cells --
  { ID id-CSG-Membership-Status    CRITICALITY ignore EXTENSION CSG-Membership-Status    PRESENCE optional } |
-- Extension for Release 10 to indicate Management Based MDT Allowed --
  { ID id-Management-Based-MDT-Allowed CRITICALITY ignore EXTENSION Management-Based-MDT-Allowed PRESENCE optional } |
}
```

```

-- Extension for Release 11 to indicate MDT PLMN List --
  { ID id-Management-Based-MDT-PLMN-List CRITICALITY ignore EXTENSION MDT-PLMN-List PRESENCE optional } |
-- Extension for Release 11 rSRVCC operation --
  { ID id-RSRVCC-Operation-Possible CRITICALITY ignore EXTENSION RSRVCC-Operation-Possible PRESENCE optional } |
-- Extension for Release 11 to indicate the last E-UTRAN PLMN Identity --
  { ID id-LastE-UTRANPLMNIdentity CRITICALITY ignore EXTENSION PLMNIdentity PRESENCE optional } |
  { ID id-PowerSavingIndicator CRITICALITY ignore EXTENSION PowerSavingIndicator PRESENCE optional },
  ...
}

-- *****
--
-- CN INVOKE TRACE ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- CN Invoke Trace
--
-- *****

CN-InvokeTrace ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {CN-InvokeTraceIEs} },
  protocolExtensions ProtocolExtensionContainer { {CN-InvokeTraceExtensions} } OPTIONAL,
  ...
}

CN-InvokeTraceIEs RANAP-PROTOCOL-IES ::= {
  { ID id-TraceType CRITICALITY ignore TYPE TraceType PRESENCE optional } |
  -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
  { ID id-TraceReference CRITICALITY ignore TYPE TraceReference PRESENCE mandatory } |
  { ID id-TriggerID CRITICALITY ignore TYPE TriggerID PRESENCE optional } |
  -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
  { ID id-UE-ID CRITICALITY ignore TYPE UE-ID PRESENCE optional } |
  -- This information is mandatory for UTRAN, optional for GERAN Iu mode --
  { ID id-OMC-ID CRITICALITY ignore TYPE OMC-ID PRESENCE optional },
  -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
  ...
}

CN-InvokeTraceExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable signalling based activation for Subscriber and Equipment Trace over Iu interface --
  { ID id-TracePropagationParameters CRITICALITY ignore EXTENSION TracePropagationParameters PRESENCE optional} |
-- Extension for Release 10 to support MDT--
  { ID id-MDT-Configuration CRITICALITY ignore EXTENSION MDT-Configuration PRESENCE optional} |
-- Extension for Release 10 to support MDT--
  { ID id-Trace-Collection-Entity-IP-Address CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},
  ...
}

-- *****
--
-- CN DEACTIVATE TRACE ELEMENTARY PROCEDURE

```

```

--
-- *****
-- *****
--
-- CN Deactivate Trace
--
-- *****

CN-DeactivateTrace ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {CN-DeactivateTraceIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {CN-DeactivateTraceExtensions} }          OPTIONAL,
    ...
}

CN-DeactivateTraceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TraceReference          CRITICALITY ignore  TYPE TraceReference          PRESENCE mandatory } |
    { ID id-TriggerID              CRITICALITY ignore  TYPE TriggerID              PRESENCE optional },
    -- This information is optional for GERAN Iu Mode, not applicable to UTRAN --
    ...
}

CN-DeactivateTraceExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- LOCATION REPORTING CONTROL ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Location Reporting Control
--
-- *****

LocationReportingControl ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {LocationReportingControlIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {LocationReportingControlExtensions} }          OPTIONAL,
    ...
}

LocationReportingControlIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RequestType          CRITICALITY ignore  TYPE RequestType          PRESENCE mandatory },
    ...
}

LocationReportingControlExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-VerticalAccuracyCode          CRITICALITY ignore  EXTENSION VerticalAccuracyCode          PRESENCE optional } |
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-ResponseTime                CRITICALITY ignore  EXTENSION ResponseTime                PRESENCE optional } |
}

```

```

-- Extension for Release 4 to enhance the location request over Iu --
  { ID id-PositioningPriority          CRITICALITY ignore EXTENSION PositioningPriority PRESENCE optional } |
-- Extension for Release 4 to enhance the location request over Iu --
  { ID id-ClientType                  CRITICALITY ignore EXTENSION ClientType PRESENCE optional } |
-- Extension for Release 7 to allow the request of velocity over Iu --
  { ID id-IncludeVelocity             CRITICALITY ignore EXTENSION IncludeVelocity PRESENCE optional } |
-- Extension for Release 7 to allow periodic reporting over Iu --
  { ID id-PeriodicLocationInfo       CRITICALITY ignore EXTENSION PeriodicLocationInfo PRESENCE optional },
  ...
}

-- *****
--
-- LOCATION REPORT ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Location Report
--
-- *****

LocationReport ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {LocationReportIEs} },
  protocolExtensions  ProtocolExtensionContainer { {LocationReportExtensions} } OPTIONAL,
  ...
}

LocationReportIEs RANAP-PROTOCOL-IES ::= {
  { ID id-AreaIdentity          CRITICALITY ignore TYPE AreaIdentity PRESENCE optional } |
  { ID id-Cause                 CRITICALITY ignore TYPE Cause PRESENCE optional } |
  { ID id-RequestType          CRITICALITY ignore TYPE RequestType PRESENCE optional } ,
  ...
}

LocationReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable report of Last Known Service Area with its Age over Iu --
  { ID id-LastKnownServiceArea CRITICALITY ignore EXTENSION LastKnownServiceArea PRESENCE optional} |
-- Extension for Release 5 to pass the positioning methods that have been used --
  { ID id-PositionData         CRITICALITY ignore EXTENSION PositionData PRESENCE optional}|
-- Extension for Release 5 to pass the positioning methods that have been used for GERAN Iu mode --
  { ID id-PositionDataSpecificToGERANIuMode CRITICALITY ignore EXTENSION PositionDataSpecificToGERANIuMode PRESENCE optional}|
  -- This extension is optional for GERAN Iu mode only, not applicable for UTRAN --
-- Extension for Release 6 to indicate whether the returned position estimate satisfies the requested accuracy or not --
  { ID id-AccuracyFulfilmentIndicator CRITICALITY ignore EXTENSION AccuracyFulfilmentIndicator PRESENCE optional}|
-- Extension for Release 7 to provide a velocity estimate --
  { ID id-VelocityEstimate       CRITICALITY ignore EXTENSION VelocityEstimate PRESENCE optional}|
-- Extension for Release 13 to provide a barometric pressure --
  { ID id-BarometricPressure     CRITICALITY ignore EXTENSION BarometricPressure PRESENCE optional}|
-- Extension for Release 13 to provide a civic address --
  { ID id-CivicAddress           CRITICALITY ignore EXTENSION CivicAddress PRESENCE optional},
  ...
}

```

```

-- *****
--
-- INITIAL UE MESSAGE ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Initial UE Message
--
-- *****

InitialUE-Message ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {InitialUE-MessageIEs} },
    protocolExtensions   ProtocolExtensionContainer    { {InitialUE-MessageExtensions} }     OPTIONAL,
    ...
}

InitialUE-MessageIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY ignore TYPE CN-DomainIndicator          PRESENCE mandatory } |
    { ID id-LAI                         CRITICALITY ignore TYPE LAI                     PRESENCE mandatory } |
    { ID id-RAC                         CRITICALITY ignore TYPE RAC                     PRESENCE conditional } |
    -- This IE shall be present if the CN Domain Indicator IE is set to "PS domain" --
    { ID id-SAI                         CRITICALITY ignore TYPE SAI                     PRESENCE mandatory } |
    { ID id-NAS-PDU                     CRITICALITY ignore TYPE NAS-PDU                 PRESENCE mandatory } |
    { ID id-IuSigConId                  CRITICALITY ignore TYPE IuSignallingConnectionIdentifier PRESENCE mandatory } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore TYPE GlobalRNC-ID            PRESENCE mandatory },
    ...
}

InitialUE-MessageExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark              CRITICALITY ignore EXTENSION GERAN-Classmark      PRESENCE optional} |
-- Extension for Release 6 to convey the selected PLMN id in shared networks --
    { ID id-SelectedPLMN-ID              CRITICALITY ignore EXTENSION PLMNidentity         PRESENCE optional} |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore EXTENSION PermanentNAS-UE-ID   PRESENCE optional} |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-NAS-SequenceNumber          CRITICALITY ignore EXTENSION NAS-SequenceNumber   PRESENCE optional} |
-- Extension for Release 6 to indicate rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-RedirectAttemptFlag          CRITICALITY ignore EXTENSION RedirectAttemptFlag   PRESENCE optional} |
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID              CRITICALITY reject EXTENSION ExtendedRNC-ID       PRESENCE optional} |
-- Extension for Release 8 to support CSG --
    { ID id-CSG-Id                      CRITICALITY reject EXTENSION CSG-Id               PRESENCE optional} |
-- Extension for Release 9 to allow communication of the cell access mode --
    { ID id-Cell-Access-Mode            CRITICALITY reject EXTENSION Cell-Access-Mode     PRESENCE optional} |
-- Extension for Release 10 to support LIPA --
    { ID id-LGW-TransportLayerAddress    CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional} |
-- Extension for Release 9 to enable the CN to handle potential UE NAS QoS issues related to higher bitrates --
    { ID id-HigherBitratesThan16MbpsFlag CRITICALITY ignore EXTENSION HigherBitratesThan16MbpsFlag PRESENCE optional} |
-- Extension for Release 11 to support BBAI --
    { ID id-Tunnel-Information-for-BBF   CRITICALITY ignore EXTENSION TunnelInformation     PRESENCE optional} |
}

```

```

-- Extension for Release 12 to support SIPTO@LN with collocated L-GW--
  { ID id-SIPTO-LGW-TransportLayerAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|
-- Extension for Release 12 to support SIPTO@LN Stand-Alone --
  { ID id-LHN-ID CRITICALITY ignore EXTENSION LHN-ID PRESENCE optional}|
-- Extension for Release 13 to support DCN --
  { ID id-SGSN-Group-Identity CRITICALITY ignore EXTENSION SGSN-Group-Identity PRESENCE optional},
  ...
}

-- *****
--
-- DIRECT TRANSFER ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Direct Transfer
--
-- *****

DirectTransfer ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {DirectTransferIEs} },
  protocolExtensions ProtocolExtensionContainer { {DirectTransferExtensions} } OPTIONAL,
  ...
}

DirectTransferIEs RANAP-PROTOCOL-IES ::= {
  { ID id-NAS-PDU CRITICALITY ignore TYPE NAS-PDU PRESENCE mandatory}|
  { ID id-LAI CRITICALITY ignore TYPE LAI PRESENCE optional}|
  { ID id-RAC CRITICALITY ignore TYPE RAC PRESENCE optional}|
  { ID id-SAI CRITICALITY ignore TYPE SAI PRESENCE optional}|
  { ID id-SAPI CRITICALITY ignore TYPE SAPI PRESENCE optional},
  ...
}

DirectTransferExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
  { ID id-RedirectionIndication CRITICALITY ignore EXTENSION RedirectionIndication PRESENCE optional}|
-- Extension for Release 6 to indicate the MOCN rerouting is completed --
  { ID id-RedirectionCompleted CRITICALITY ignore EXTENSION RedirectionCompleted PRESENCE optional}|
-- Extension for Release 8 to indicate the Subscriber Profile ID for RAT/Frequency Selection Priority --
  { ID id-SubscriberProfileIDforRFP CRITICALITY ignore EXTENSION SubscriberProfileIDforRFP PRESENCE optional}|
-- Extension for Release 10 to support LIPA --
  { ID id-LGW-TransportLayerAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|
-- Extension for Release 12 to support SIPTO@LN with collocated L-GW --
  { ID id-SIPTO-LGW-TransportLayerAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|
-- Extension for Release 12 to support SIPTO@LN Stand-Alone --
  { ID id-LHN-ID CRITICALITY ignore EXTENSION LHN-ID PRESENCE optional},
  ...
}

RedirectionIndication ::= ProtocolIE-Container { {RedirectionIndication-IEs} }

```

```

RedirectionIndication-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-NAS-PDU CRITICALITY ignore TYPE NAS-PDU PRESENCE mandatory} |
  { ID id-RejectCauseValue CRITICALITY ignore TYPE RejectCauseValue PRESENCE mandatory} |
  { ID id-NAS-SequenceNumber CRITICALITY ignore TYPE NAS-SequenceNumber PRESENCE optional} |
  { ID id-PermanentNAS-UE-ID CRITICALITY ignore TYPE PermanentNAS-UE-ID PRESENCE optional} |
  { ID id-Additional-CSPS-coordination-information CRITICALITY reject TYPE Additional-CSPS-coordination-information PRESENCE optional},
  ...
}

-- *****
--
-- OVERLOAD CONTROL ELEMENTARY PROCEDURE
--
-- *****
--
-- Overload
--
-- *****

Overload ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {OverloadIEs} },
  protocolExtensions ProtocolExtensionContainer { {OverloadExtensions} } OPTIONAL,
  ...
}

OverloadIEs RANAP-PROTOCOL-IES ::= {
  { ID id-NumberOfSteps CRITICALITY ignore TYPE NumberOfSteps PRESENCE optional} |
  { ID id-GlobalRNC-ID CRITICALITY ignore TYPE GlobalRNC-ID PRESENCE optional},
  ...
}

OverloadExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable the indication to the RNC which CN domain is suffering the signalling traffic overload --
  { ID id-CN-DomainIndicator CRITICALITY ignore EXTENSION CN-DomainIndicator PRESENCE optional} |
-- Extension for Release 5 to enable NNSF --
  { ID id-GlobalCN-ID CRITICALITY ignore EXTENSION GlobalCN-ID PRESENCE optional} |
-- Extension for Release 7 to indicate extended RNC-ID --
  { ID id-ExtendedRNC-ID CRITICALITY reject EXTENSION ExtendedRNC-ID PRESENCE optional} |
-- Extension for Release 10 to support Low Priority overload --
  { ID id-Priority-Class-Indicator CRITICALITY ignore EXTENSION Priority-Class-Indicator PRESENCE optional},
  ...
}

-- *****
--
-- ERROR INDICATION ELEMENTARY PROCEDURE
--
-- *****
--
-- Error Indication

```

```

--
-- *****
ErrorIndication ::= SEQUENCE {
  protocolIEs           ProtocolIE-Container     { {ErrorIndicationIEs} },
  protocolExtensions    ProtocolExtensionContainer { {ErrorIndicationExtensions} }           OPTIONAL,
  ...
}

ErrorIndicationIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Cause                CRITICALITY ignore TYPE Cause                PRESENCE optional } |
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional } |
  { ID id-CN-DomainIndicator    CRITICALITY ignore TYPE CN-DomainIndicator   PRESENCE optional } |
  { ID id-GlobalRNC-ID          CRITICALITY ignore TYPE GlobalRNC-ID          PRESENCE optional },
  ...
}

ErrorIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
  { ID id-GlobalCN-ID          CRITICALITY ignore     EXTENSION GlobalCN-ID          PRESENCE optional } |
-- Extension for Release 7 to indicate extended RNC-ID --
  { ID id-ExtendedRNC-ID       CRITICALITY reject      EXTENSION ExtendedRNC-ID       PRESENCE optional },
  ...
}

-- *****
--
-- SRNS DATA FORWARD ELEMENTARY PROCEDURE
--
-- *****
--
-- SRNS Data Forward Command
--
-- *****

SRNS-DataForwardCommand ::= SEQUENCE {
  protocolIEs           ProtocolIE-Container     { {SRNS-DataForwardCommandIEs} },
  protocolExtensions    ProtocolExtensionContainer { {SRNS-DataForwardCommandExtensions} }           OPTIONAL,
  ...
}

SRNS-DataForwardCommandIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-DataForwardingList          CRITICALITY ignore TYPE RAB-DataForwardingList          PRESENCE optional },
  ...
}

SRNS-DataForwardCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--

```



```

    { ID id-RAB-SetupOrModifyItem          FIRST CRITICALITY reject  FIRST TYPE RAB-SetupOrModifyItemFirst
      SECOND CRITICALITY ignore  SECOND TYPE RAB-SetupOrModifyItemSecond
      PRESENCE mandatory },
    ...
}

RAB-SetupOrModifyItemFirst ::= SEQUENCE {
  rAB-ID                RAB-ID,
  nAS-SynchronisationIndicator  NAS-SynchronisationIndicator  OPTIONAL,
  rAB-Parameters        RAB-Parameters  OPTIONAL,
  userPlaneInformation  UserPlaneInformation  OPTIONAL,
  transportLayerInformation  TransportLayerInformation  OPTIONAL,
  service-Handover      Service-Handover  OPTIONAL,
  iE-Extensions         ProtocolExtensionContainer { {RAB-SetupOrModifyItemFirst-ExtIEs} }  OPTIONAL,
  ...
}

TransportLayerInformation ::= SEQUENCE {
  transportLayerAddress  TransportLayerAddress,
  iuTransportAssociation IuTransportAssociation,
  iE-Extensions         ProtocolExtensionContainer { {TransportLayerInformation-ExtIEs} }  OPTIONAL,
  ...
}

TransportLayerInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-SetupOrModifyItemFirst-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 8 to enable handover restriction to E-UTRAN --
  { ID id-E-UTRAN-Service-Handover  CRITICALITY ignore  EXTENSION E-UTRAN-Service-Handover  PRESENCE optional}|
-- Extension for Release 10 to support LIPA --
  { ID id-Correlation-ID            CRITICALITY ignore  EXTENSION Correlation-ID            PRESENCE optional}|
-- Extension for Release 12 to support SIPTO@LN with collocated L-GW --
  { ID id-SIPTO-Correlation-ID      CRITICALITY ignore  EXTENSION Correlation-ID            PRESENCE optional},
  ...
}

RAB-SetupOrModifyItemSecond ::= SEQUENCE {
  pdp-TypeInformation    PDP-TypeInformation  OPTIONAL,
  dataVolumeReportingIndication  DataVolumeReportingIndication  OPTIONAL,
  dl-GTP-PDU-SequenceNumber  DL-GTP-PDU-SequenceNumber  OPTIONAL,
  ul-GTP-PDU-SequenceNumber  UL-GTP-PDU-SequenceNumber  OPTIONAL,
  dl-N-PDU-SequenceNumber    DL-N-PDU-SequenceNumber  OPTIONAL,
  ul-N-PDU-SequenceNumber    UL-N-PDU-SequenceNumber  OPTIONAL,
  iE-Extensions         ProtocolExtensionContainer { {RAB-SetupOrModifyItemSecond-ExtIEs} }  OPTIONAL,
  ...
}

RAB-SetupOrModifyItemSecond-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
  { ID id-Alt-RAB-Parameters        CRITICALITY ignore  EXTENSION Alt-RAB-Parameters        PRESENCE optional}|
-- Extension for Release 5 to enable GERAN support over Iu-cs --
  { ID id-GERAN-BSC-Container        CRITICALITY ignore  EXTENSION GERAN-BSC-Container        PRESENCE optional}|
}

```

```

-- Extension for Release Release 9 to enable a new value --
  { ID id-PDP-TypeInformation-extension      CRITICALITY ignore  EXTENSION PDP-TypeInformation-extension  PRESENCE optional} |
-- Extension for Release 10 to enable Offload at Iu-ps for UTRAN --
  { ID id-Offload-RAB-Parameters            CRITICALITY ignore  EXTENSION Offload-RAB-Parameters    PRESENCE optional},
  ...
}

RAB-AssignmentRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-UE-AggregateMaximumBitRate      CRITICALITY ignore  EXTENSION UE-AggregateMaximumBitRate PRESENCE optional} |
-- Extension for Release 10 to enable Offload at Iu-ps for UTRAN --
  { ID id-MSISDN                          CRITICALITY ignore  EXTENSION MSISDN                    PRESENCE optional},
  ...
}

-- *****
--
-- RAB Assignment Response
--
-- *****

RAB-AssignmentResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {RAB-AssignmentResponseIEs} },
  protocolExtensions   ProtocolExtensionContainer { {RAB-AssignmentResponseExtensions} }      OPTIONAL,
  ...
}

RAB-AssignmentResponseIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupOrModifiedList          CRITICALITY ignore  TYPE RAB-SetupOrModifiedList          PRESENCE optional } |
  { ID id-RAB-ReleasedList                 CRITICALITY ignore  TYPE RAB-ReleasedList                 PRESENCE optional } |

  { ID id-RAB-QueuedList                   CRITICALITY ignore  TYPE RAB-QueuedList                   PRESENCE optional } |
  { ID id-RAB-FailedList                   CRITICALITY ignore  TYPE RAB-FailedList                   PRESENCE optional } |
  { ID id-RAB-ReleaseFailedList           CRITICALITY ignore  TYPE RAB-ReleaseFailedList           PRESENCE optional } |
  { ID id-CriticalityDiagnostics           CRITICALITY ignore  TYPE CriticalityDiagnostics           PRESENCE optional },
  ...
}

RAB-SetupOrModifiedList ::= RAB-IE-ContainerList { {RAB-SetupOrModifiedItemIEs} }

RAB-SetupOrModifiedItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupOrModifiedItem          CRITICALITY ignore  TYPE RAB-SetupOrModifiedItem          PRESENCE mandatory },
  ...
}

RAB-SetupOrModifiedItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  transportLayerAddress TransportLayerAddress  OPTIONAL,
  iuTransportAssociation IuTransportAssociation  OPTIONAL,
  dl-dataVolumes        DataVolumeList         OPTIONAL,
  iE-Extensions         ProtocolExtensionContainer { {RAB-SetupOrModifiedItem-ExtIEs} }      OPTIONAL,
  ...
}

RAB-SetupOrModifiedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {

```

```

-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
  { ID id-Ass-RAB-Parameters      CRITICALITY ignore      EXTENSION Ass-RAB-Parameters      PRESENCE optional  },
  ...
}

RAB-ReleasedList ::= RAB-IE-ContainerList { {RAB-ReleasedItemIEs} }

RAB-ReleasedItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleasedItem      CRITICALITY ignore      TYPE RAB-ReleasedItem      PRESENCE mandatory  },
  ...
}

RAB-ReleasedItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dl-dataVolumes        DataVolumeList      OPTIONAL,
  dl-GTP-PDU-SequenceNumber  DL-GTP-PDU-SequenceNumber      OPTIONAL,
  ul-GTP-PDU-SequenceNumber  UL-GTP-PDU-SequenceNumber      OPTIONAL,
  iE-Extensions        ProtocolExtensionContainer { {RAB-ReleasedItem-ExtIEs} }      OPTIONAL,
  ...
}

RAB-ReleasedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

DataVolumeList ::= SEQUENCE (SIZE (1..maxNrOfVol)) OF
  SEQUENCE {
    dl-UnsuccessfullyTransmittedDataVolume      UnsuccessfullyTransmittedDataVolume,
    dataVolumeReference        DataVolumeReference      OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {DataVolumeList-ExtIEs} }      OPTIONAL,
    ...
  }

DataVolumeList-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-QueuedList ::= RAB-IE-ContainerList { {RAB-QueuedItemIEs} }

RAB-QueuedItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-QueuedItem      CRITICALITY ignore      TYPE RAB-QueuedItem      PRESENCE mandatory  },
  ...
}

RAB-QueuedItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  iE-Extensions        ProtocolExtensionContainer { {RAB-QueuedItem-ExtIEs} }      OPTIONAL,
  ...
}

RAB-QueuedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

```

```

RAB-ReleaseFailedList ::= RAB-FailedList

RAB-AssignmentResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
  { ID id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse      CRITICALITY ignore  EXTENSION GERAN-Iumode-RAB-FailedList-RABAssgntResponse
    PRESENCE optional} ,
  ...
}

GERAN-Iumode-RAB-FailedList-RABAssgntResponse      ::= RAB-IE-ContainerList { {GERAN-Iumode-RAB-Failed-RABAssgntResponse-ItemIEs} }

GERAN-Iumode-RAB-Failed-RABAssgntResponse-ItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item      CRITICALITY ignore  TYPE GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item
    PRESENCE mandatory } ,
  ...
}

GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item ::= SEQUENCE {
  rAB-ID                RAB-ID,
  cause                 Cause,
  gERAN-Classmark      GERAN-Classmark      OPTIONAL,
  iE-Extensions        ProtocolExtensionContainer { {GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item-ExtIEs} }      OPTIONAL,
  ...
}

GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- PRIVATE MESSAGE
--
-- *****

PrivateMessage ::= SEQUENCE {
  privateIEs      PrivateIE-Container      { {PrivateMessage-IEs } },
  ...
}

PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
  ...
}

-- *****
--
-- RANAP RELOCATION INFORMATION ELEMENTARY PROCEDURE
--
-- *****

RANAP-RelocationInformation ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { {RANAP-RelocationInformationIEs} },
  protocolExtensions      ProtocolExtensionContainer { {RANAP-RelocationInformationExtensions} }      OPTIONAL,
  ...
}

```

```

}

RANAP-RelocationInformationIEs RANAP-PROTOCOL-IES ::= {
  { ID id-DirectTransferInformationList-RANAP-RelocInf
    CRITICALITY ignore TYPE DirectTransferInformationList-RANAP-RelocInf
    PRESENCE optional } |
  { ID id-RAB-ContextList-RANAP-RelocInf CRITICALITY ignore TYPE RAB-ContextList-RANAP-RelocInf PRESENCE optional },
  ...
}

DirectTransferInformationList-RANAP-RelocInf ::= DirectTransfer-IE-ContainerList { {DirectTransferInformationItemIEs-RANAP-RelocInf} }

DirectTransferInformationItemIEs-RANAP-RelocInf RANAP-PROTOCOL-IES ::= {
  { ID id-DirectTransferInformationItem-RANAP-RelocInf
    CRITICALITY ignore TYPE DirectTransferInformationItem-RANAP-RelocInf
    PRESENCE mandatory },
  ...
}

DirectTransferInformationItem-RANAP-RelocInf ::= SEQUENCE {
  nAS-PDU NAS-PDU,
  sAPI SAPI,
  cN-DomainIndicator CN-DomainIndicator,
  iE-Extensions ProtocolExtensionContainer { {RANAP-DirectTransferInformationItem-ExtIEs-RANAP-RelocInf} } OPTIONAL,
  ...
}

RANAP-DirectTransferInformationItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-ContextList-RANAP-RelocInf ::= RAB-IE-ContainerList { {RAB-ContextItemIEs-RANAP-RelocInf} }

RAB-ContextItemIEs-RANAP-RelocInf RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ContextItem-RANAP-RelocInf CRITICALITY ignore TYPE RAB-ContextItem-RANAP-RelocInf PRESENCE mandatory },
  ...
}

RAB-ContextItem-RANAP-RelocInf ::= SEQUENCE {
  rAB-ID RAB-ID,
  dl-GTP-PDU-SequenceNumber DL-GTP-PDU-SequenceNumber OPTIONAL,
  ul-GTP-PDU-SequenceNumber UL-GTP-PDU-SequenceNumber OPTIONAL,
  dl-N-PDU-SequenceNumber DL-N-PDU-SequenceNumber OPTIONAL,
  ul-N-PDU-SequenceNumber UL-N-PDU-SequenceNumber OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs-RANAP-RelocInf} } OPTIONAL,
  ...
}

RAB-ContextItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RANAP-RelocationInformationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable relocation of Source RNC PDCP context info --

```

```

    { ID id-SourceRNC-PDCP-context-info      CRITICALITY ignore EXTENSION RRC-Container          PRESENCE optional } |
-- Extension for Release 10 to enable RNSAP Relocation --
    { ID id-RNSAPRelocationParameters        CRITICALITY reject  EXTENSION RNSAPRelocationParameters PRESENCE optional },
    ...
}

-- *****
--
-- RANAP ENHANCED RELOCATION INFORMATION ELEMENTARY PROCEDURE
--
-- *****
--
-- RANAP Enhanced Relocation Information Request
--
-- *****

RANAP-EnhancedRelocationInformationRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {RANAP-EnhancedRelocationInformationRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RANAP-EnhancedRelocationInformationRequestExtensions} } OPTIONAL,
    ...
}

RANAP-EnhancedRelocationInformationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Source-ToTarget-TransparentContainer
        CRITICALITY reject TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE mandatory } |
    { ID id-OldIuSigConIdCS CRITICALITY ignore TYPE IuSignallingConnectionIdentifier PRESENCE optional } |
    { ID id-GlobalCN-IDCS   CRITICALITY reject TYPE GlobalCN-ID PRESENCE optional } |
    { ID id-OldIuSigConIdPS CRITICALITY ignore TYPE IuSignallingConnectionIdentifier PRESENCE optional } |
    { ID id-GlobalCN-IDPS   CRITICALITY reject TYPE GlobalCN-ID PRESENCE optional } |
    { ID id-RAB-SetupList-EnhRelocInfoReq CRITICALITY reject TYPE RAB-SetupList-EnhRelocInfoReq PRESENCE optional } |
    { ID id-SNA-Access-Information CRITICALITY ignore TYPE SNA-Access-Information PRESENCE optional } |
    { ID id-UESBI-Iu CRITICALITY ignore TYPE UESBI-Iu PRESENCE optional } |
    { ID id-SelectedPLMN-ID CRITICALITY ignore TYPE PLMNidentity PRESENCE optional } |
    { ID id-CNMBMSLinkingInformation CRITICALITY ignore TYPE CNMBMSLinkingInformation PRESENCE optional },
    ...
}

RAB-SetupList-EnhRelocInfoReq ::= RAB-IE-ContainerList { { RAB-SetupItem-EnhRelocInfoReq-IEs } }

RAB-SetupItem-EnhRelocInfoReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-EnhRelocInfoReq CRITICALITY reject TYPE RAB-SetupItem-EnhRelocInfoReq PRESENCE mandatory },
    ...
}

RAB-SetupItem-EnhRelocInfoReq ::= SEQUENCE {
    rAB-ID RAB-ID,
    cN-DomainIndicator CN-DomainIndicator,
    rAB-Parameters RAB-Parameters,
    dataVolumeReportingIndication DataVolumeReportingIndication OPTIONAL
-- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    pdp-TypeInformation PDP-TypeInformation OPTIONAL
-- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,

```

```

userPlaneInformation          UserPlaneInformation,
dataForwardingInformation    TNLInformationEnhRelInfoReq OPTIONAL,
sourceSideIuULTNLInfo       TNLInformationEnhRelInfoReq OPTIONAL,

service-Handover             Service-Handover          OPTIONAL,
alt-RAB-Parameters          Alt-RAB-Parameters    OPTIONAL,
iE-Extensions                ProtocolExtensionContainer { { RAB-SetupItem-EnhRelocInfoReq-ExtIEs } } OPTIONAL,
...
}

RAB-SetupItem-EnhRelocInfoReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 8 to enable handover restriction to E-UTRAN --
  { ID id-E-UTRAN-Service-Handover          CRITICALITY ignore  EXTENSION E-UTRAN-Service-Handover          PRESENCE optional } |
-- Extension for Release Release 9 to enable a new value --
  { ID id-PDP-TypeInformation-extension     CRITICALITY ignore  EXTENSION PDP-TypeInformation-extension  PRESENCE optional },
  ...
}

TNLInformationEnhRelInfoReq ::=SEQUENCE{
  transportLayerAddress      TransportLayerAddress,
  iuTransportAssociation      IuTransportAssociation,
  iE-Extensions              ProtocolExtensionContainer { { TNLInformationEnhRelInfoReq-ExtIEs } } OPTIONAL,
  ...
}

TNLInformationEnhRelInfoReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RANAP-EnhancedRelocationInformationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-IntegrityProtectionInformation  CRITICALITY ignore  EXTENSION IntegrityProtectionInformation  PRESENCE optional} |
  { ID id-EncryptionInformation          CRITICALITY ignore  EXTENSION EncryptionInformation          PRESENCE optional} |
  { ID id-UE-AggregateMaximumBitRate     CRITICALITY ignore  EXTENSION UE-AggregateMaximumBitRate     PRESENCE optional} |
-- Extension for Release 10 to enable RNSAP Relocation --
  { ID id-RABParametersList              CRITICALITY reject  EXTENSION RABParametersList              PRESENCE optional} |
  { ID id-CSG-Id                         CRITICALITY reject  EXTENSION CSG-Id                         PRESENCE optional} |
  { ID id-CSG-Membership-Status          CRITICALITY reject  EXTENSION CSG-Membership-Status          PRESENCE optional} |
-- Extension for Release 11 to support rSRVCC in case of network sharing -
  { ID id-AnchorPLMN-ID                  CRITICALITY ignore  EXTENSION PLMNidentity                    PRESENCE optional},
  ...
}

-- *****
--
-- RANAP Enhanced Relocation Information Response
--
-- *****

RANAP-EnhancedRelocationInformationResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {RANAP-EnhancedRelocationInformationResponseIEs} },
  protocolExtensions   ProtocolExtensionContainer { {RANAP-EnhancedRelocationInformationResponseExtensions} } OPTIONAL,
  ...
}

```

```

RANAP-EnhancedRelocationInformationResponseIES RANAP-PROTOCOL-IES ::= {
  { ID id-Target-ToSource-TransparentContainer
    CRITICALITY ignore TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE optional } |
  { ID id-RAB-SetupList-EnhRelocInfoRes CRITICALITY ignore TYPE RAB-SetupList-EnhRelocInfoRes PRESENCE optional } |
  { ID id-RAB-FailedList-EnhRelocInfoRes CRITICALITY ignore TYPE RAB-FailedList-EnhRelocInfoRes PRESENCE optional } |
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

RAB-SetupList-EnhRelocInfoRes ::= RAB-IE-ContainerList { { RAB-SetupItem-EnhRelocInfoRes-IEs } }

RAB-SetupItem-EnhRelocInfoRes-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupItem-EnhRelocInfoRes CRITICALITY reject TYPE RAB-SetupItem-EnhRelocInfoRes PRESENCE mandatory },
  ...
}

RAB-SetupItem-EnhRelocInfoRes ::= SEQUENCE {
  cN-DomainIndicator CN-DomainIndicator,
  rAB-ID RAB-ID,
  dataForwardingInformation TNLInformationEnhRelInfoRes OPTIONAL,
  ass-RAB-Parameters Ass-RAB-Parameters OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { RAB-SetupItem-EnhRelocInfoRes-ExtIEs } } OPTIONAL,
  ...
}

RAB-SetupItem-EnhRelocInfoRes-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RAB-FailedList-EnhRelocInfoRes ::= RAB-IE-ContainerList { { RAB-FailedItem-EnhRelocInfoRes-IEs } }

RAB-FailedItem-EnhRelocInfoRes-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-FailedItem-EnhRelocInfoRes CRITICALITY reject TYPE RAB-FailedItem-EnhRelocInfoRes PRESENCE mandatory },
  ...
}

RAB-FailedItem-EnhRelocInfoRes ::= SEQUENCE {
  cN-DomainIndicator CN-DomainIndicator,
  rAB-ID RAB-ID,
  cause Cause,
  iE-Extensions ProtocolExtensionContainer { { RAB-FailedItem-EnhRelocInfoRes-ExtIEs } } OPTIONAL,
  ...
}

RAB-FailedItem-EnhRelocInfoRes-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

TNLInformationEnhRelInfoRes ::= SEQUENCE {
  dl-forwardingTransportLayerAddress TransportLayerAddress,
  dl-forwardingTransportAssociation IuTransportAssociation,
  iE-Extensions ProtocolExtensionContainer { { TNLInformationEnhRelInfoRes-ExtIEs } } OPTIONAL,
  ...
}

```

```

TNLInformationEnhRelInfoRes-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RANAP-EnhancedRelocationInformationResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
-- *****
--
-- RAB MODIFICATION REQUEST ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- RAB Modify Request
--
-- *****

RAB-ModifyRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RAB-ModifyRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {RAB-ModifyRequestExtensions} }          OPTIONAL,
    ...
}

RAB-ModifyRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ModifyList          CRITICALITY ignore TYPE RAB-ModifyList          PRESENCE mandatory},
    ...
}

RAB-ModifyList          ::= RAB-IE-ContainerList { {RAB-ModifyItemIEs} }

RAB-ModifyItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ModifyItem          CRITICALITY ignore TYPE RAB-ModifyItem          PRESENCE mandatory },
    ...
}

RAB-ModifyItem ::= SEQUENCE {
    rAB-ID                RAB-ID,
    requested-RAB-Parameter-Values Requested-RAB-Parameter-Values,
    iE-Extensions         ProtocolExtensionContainer { {RAB-ModifyItem-ExtIEs} }          OPTIONAL,
    ...
}

RAB-ModifyItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ModifyRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
-- *****

```

```

--
-- LOCATION RELATED DATA ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Location Related Data Request
--
-- *****

LocationRelatedDataRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {LocationRelatedDataRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer { {LocationRelatedDataRequestExtensions} }      OPTIONAL,
    ...
}

LocationRelatedDataRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-LocationRelatedDataRequestType      CRITICALITY reject  TYPE LocationRelatedDataRequestType  PRESENCE optional },
    -- This IE is mandatory for UTRAN, optional for GERAN Iu Mode --
    ...
}

LocationRelatedDataRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable LCS support for GERAN Iu mode --
    { ID id-LocationRelatedDataRequestTypeSpecificToGERANIuMode      CRITICALITY reject  EXTENSION
LocationRelatedDataRequestTypeSpecificToGERANIuMode      PRESENCE optional }|
    -- The previous extension is optional for GERAN Iu Mode only, not applicable for UTRAN --
    -- Extension for Release 7 to request GANSS Assistance Data. This IE shall be present if the Requested Location Related Data Type IE is set to
    -- "Dedicated Assistance Data for Assisted GANSS" or `Dedicated Assistance Data for Assisted GPS and GANSS"--
    { ID id-RequestedGANSSAssistanceData      CRITICALITY reject  EXTENSION RequestedGANSSAssistanceData
PRESENCE conditional      },
    ...
}

-- *****
--
-- Location Related Data Response
--
-- *****

LocationRelatedDataResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { LocationRelatedDataResponseIEs} },
    protocolExtensions   ProtocolExtensionContainer { { LocationRelatedDataResponseExtensions} }      OPTIONAL,
    ...
}

LocationRelatedDataResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-BroadcastAssistanceDataDecipheringKeys      CRITICALITY ignore  TYPE BroadcastAssistanceDataDecipheringKeys      PRESENCE optional },
    ...
}

LocationRelatedDataResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for error handling

```

```

    { ID id-CriticalityDiagnostics          CRITICALITY ignore EXTENSION CriticalityDiagnostics          PRESENCE optional }|
    { ID id-BroadcastGANSSTransmissionDataDecipheringKeys CRITICALITY ignore EXTENSION BroadcastAssistanceDataDecipheringKeys PRESENCE optional},
    ...
}

-- *****
--
-- Location Related Data Failure
--
-- *****

LocationRelatedDataFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { LocationRelatedDataFailureIEs} },
    protocolExtensions   ProtocolExtensionContainer { { LocationRelatedDataFailureExtensions} }          OPTIONAL,
    ...
}

LocationRelatedDataFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore TYPE Cause          PRESENCE mandatory },
    ...
}

LocationRelatedDataFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for error handling
    { ID id-CriticalityDiagnostics          CRITICALITY ignore EXTENSION CriticalityDiagnostics          PRESENCE optional },
    ...
}

-- *****
--
-- INFORMATION TRANSFER ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Information Transfer Indication
--
-- *****

InformationTransferIndication ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { InformationTransferIndicationIEs} },
    protocolExtensions   ProtocolExtensionContainer { { InformationTransferIndicationExtensions} }          OPTIONAL,
    ...
}

InformationTransferIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID          CRITICALITY reject TYPE InformationTransferID          PRESENCE mandatory } |
    { ID id-ProvidedData                  CRITICALITY reject TYPE ProvidedData          PRESENCE mandatory } |
    { ID id-CN-DomainIndicator            CRITICALITY reject TYPE CN-DomainIndicator          PRESENCE mandatory } |
    { ID id-GlobalCN-ID                  CRITICALITY ignore TYPE GlobalCN-ID          PRESENCE optional},
    ...
}

```

```

InformationTransferIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Information Transfer Confirmation
--
-- *****

InformationTransferConfirmation ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { InformationTransferConfirmationIEs } },
    protocolExtensions   ProtocolExtensionContainer { { InformationTransferConfirmationExtensions } }      OPTIONAL,
    ...
}

InformationTransferConfirmationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID          CRITICALITY ignore TYPE InformationTransferID          PRESENCE mandatory } |
    { ID id-CN-DomainIndicator            CRITICALITY ignore TYPE CN-DomainIndicator            PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional   } |
    { ID id-GlobalRNC-ID                  CRITICALITY ignore TYPE GlobalRNC-ID                  PRESENCE mandatory } |
    ...
}

InformationTransferConfirmationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID                CRITICALITY reject  EXTENSION ExtendedRNC-ID                PRESENCE optional },
    ...
}

-- *****
--
-- Information Transfer Failure
--
-- *****

InformationTransferFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { InformationTransferFailureIEs } },
    protocolExtensions   ProtocolExtensionContainer { { InformationTransferFailureExtensions } }      OPTIONAL,
    ...
}

InformationTransferFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID          CRITICALITY ignore TYPE InformationTransferID          PRESENCE mandatory } |
    { ID id-CN-DomainIndicator            CRITICALITY ignore TYPE CN-DomainIndicator            PRESENCE mandatory } |
    { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional   } |
    { ID id-GlobalRNC-ID                  CRITICALITY ignore TYPE GlobalRNC-ID                  PRESENCE mandatory } |
    ...
}

InformationTransferFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID                CRITICALITY reject  EXTENSION ExtendedRNC-ID                PRESENCE optional },

```

```

}
...
}
-- *****
--
-- UE SPECIFIC INFORMATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- UE Specific Information Indication
--
-- *****

UESpecificInformationIndication ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {UESpecificInformationIndicationIEs} },
    protocolExtensions   ProtocolExtensionContainer   { {UESpecificInformationIndicationExtensions} }           OPTIONAL,
    ...
}

UESpecificInformationIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-UESBI-Iu          CRITICALITY ignore TYPE UESBI-Iu          PRESENCE optional },
    ...
}

UESpecificInformationIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- DIRECT INFORMATION TRANSFER ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Direct Information Transfer
--
-- *****

DirectInformationTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { DirectInformationTransferIEs } },
    protocolExtensions   ProtocolExtensionContainer   { { DirectInformationTransferExtensions } }           OPTIONAL,
    ...
}

DirectInformationTransferIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InterSystemInformationTransferType CRITICALITY ignore TYPE InterSystemInformationTransferType PRESENCE optional } |
    { ID id-CN-DomainIndicator                 CRITICALITY ignore TYPE CN-DomainIndicator                 PRESENCE mandatory } |
    { ID id-GlobalRNC-ID                       CRITICALITY ignore TYPE GlobalRNC-ID                       PRESENCE optional } |
    { ID id-GlobalCN-ID                        CRITICALITY ignore TYPE GlobalCN-ID                        PRESENCE optional },
    ...
}

```

```

}

DirectInformationTransferExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
  { ID id-ExtendedRNC-ID          CRITICALITY reject  EXTENSION ExtendedRNC-ID          PRESENCE optional },
  ...
}

-- *****
--
-- UPLINK INFORMATION EXCHANGE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Uplink Information Exchange Request
--
-- *****

UplinkInformationExchangeRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { UplinkInformationExchangeRequestIEs } },
  protocolExtensions   ProtocolExtensionContainer { { UplinkInformationExchangeRequestExtensions } }  OPTIONAL,
  ...
}

UplinkInformationExchangeRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-InformationExchangeID      CRITICALITY reject  TYPE InformationExchangeID      PRESENCE mandatory } |
  { ID id-InformationExchangeType     CRITICALITY reject  TYPE InformationExchangeType     PRESENCE mandatory } |
  { ID id-InformationTransferType     CRITICALITY reject  TYPE InformationTransferType     PRESENCE conditional } |
  -- This IE shall be present if the Information Exchange Type IE is set to "transfer" -- } |
  { ID id-InformationRequestType     CRITICALITY reject  TYPE InformationRequestType     PRESENCE conditional } |
  -- This IE shall be present if the Information Exchange Type IE is set to "request" -- } |
  { ID id-CN-DomainIndicator         CRITICALITY reject  TYPE CN-DomainIndicator         PRESENCE mandatory } |
  { ID id-GlobalRNC-ID              CRITICALITY reject  TYPE GlobalRNC-ID              PRESENCE mandatory },
  ...
}

UplinkInformationExchangeRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
  { ID id-ExtendedRNC-ID          CRITICALITY reject  EXTENSION ExtendedRNC-ID          PRESENCE optional },
  ...
}

-- *****
--
-- Uplink Information Exchange Response
--
-- *****

UplinkInformationExchangeResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { UplinkInformationExchangeResponseIEs } },
  protocolExtensions   ProtocolExtensionContainer { { UplinkInformationExchangeResponseExtensions } }  OPTIONAL,
  ...
}

```

```

}

UplinkInformationExchangeResponseIEs RANAP-PROTOCOL-IES ::= {
  { ID id-InformationExchangeID      CRITICALITY ignore TYPE InformationExchangeID      PRESENCE mandatory } |
  { ID id-InformationRequested        CRITICALITY ignore TYPE InformationRequested        PRESENCE optional   } |
  { ID id-CN-DomainIndicator          CRITICALITY ignore TYPE CN-DomainIndicator          PRESENCE mandatory } |
  { ID id-GlobalCN-ID                 CRITICALITY ignore TYPE GlobalCN-ID                 PRESENCE optional   } |
  { ID id-CriticalityDiagnostics      CRITICALITY ignore TYPE CriticalityDiagnostics      PRESENCE optional   } ,
  ...
}

UplinkInformationExchangeResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- Uplink Information Exchange Failure
--
-- *****

UplinkInformationExchangeFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { UplinkInformationExchangeFailureIEs } },
  protocolExtensions   ProtocolExtensionContainer    { { UplinkInformationExchangeFailureExtensions } }          OPTIONAL,
  ...
}

UplinkInformationExchangeFailureIEs RANAP-PROTOCOL-IES ::= {
  { ID id-InformationExchangeID      CRITICALITY ignore TYPE InformationExchangeID      PRESENCE mandatory } |
  { ID id-CN-DomainIndicator          CRITICALITY ignore TYPE CN-DomainIndicator          PRESENCE mandatory } |
  { ID id-GlobalCN-ID                 CRITICALITY ignore TYPE GlobalCN-ID                 PRESENCE optional   } |
  { ID id-Cause                       CRITICALITY ignore TYPE Cause                       PRESENCE mandatory } |
  { ID id-CriticalityDiagnostics      CRITICALITY ignore TYPE CriticalityDiagnostics      PRESENCE optional   } ,
  ...
}

UplinkInformationExchangeFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- MBMS SESSION START PROCEDURE
--
-- *****

-- *****
--
-- MBMS Session Start
--
-- *****

MBMSSessionStart ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { MBMSSessionStartIEs } },

```

```
    protocolExtensions      ProtocolExtensionContainer { { MBMSSessionStartExtensions } }      OPTIONAL,
  ...
}

MBMSSessionStartIEs RANAP-PROTOCOL-IES ::= {
  { ID id-TMGI                CRITICALITY reject  TYPE TMGI                PRESENCE mandatory } |
  { ID id-MBMSsessionIdentity  CRITICALITY ignore TYPE MBMSsessionIdentity  PRESENCE optional } |
  { ID id-MBMSBearerServiceType CRITICALITY reject  TYPE MBMSBearerServiceType  PRESENCE mandatory } |
  { ID id-IuSigConId           CRITICALITY reject  TYPE IuSignallingConnectionIdentifier PRESENCE mandatory } |
  { ID id-RAB-Parameters       CRITICALITY reject  TYPE RAB-Parameters       PRESENCE mandatory } |
  { ID id-PDP-TypeInformation   CRITICALITY ignore TYPE PDP-TypeInformation   PRESENCE optional } |
  { ID id-MBMSsessionDuration  CRITICALITY reject  TYPE MBMSsessionDuration  PRESENCE mandatory } |
  { ID id-MBMSServiceArea      CRITICALITY reject  TYPE MBMSServiceArea      PRESENCE mandatory } |
  { ID id-FrequencyLayerConvergenceFlag CRITICALITY ignore TYPE FrequencyLayerConvergenceFlag PRESENCE optional } |
  { ID id-RAListofIdleModeUEs   CRITICALITY ignore TYPE RAListofIdleModeUEs   PRESENCE optional } |
  { ID id-GlobalCN-ID          CRITICALITY reject  TYPE GlobalCN-ID          PRESENCE optional } |
  { ID id-MBMSsessionRepetitionNumber CRITICALITY ignore TYPE MBMSsessionRepetitionNumber PRESENCE optional } |
  { ID id-TimeToMBMSDataTransfer CRITICALITY reject  TYPE TimeToMBMSDataTransfer PRESENCE mandatory } ,
  ...
}

MBMSSessionStartExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable MBMS counting in broadcast mode --
  { ID id-MBMSCountingInformation      CRITICALITY ignore  EXTENSION MBMSCountingInformation      PRESENCE optional } |
  { ID id-MBMSsynchronisationInformation CRITICALITY ignore  EXTENSION MBMSsynchronisationInformation PRESENCE optional } |
-- Extension for Release 9 to enable a new value --
  { ID id-PDP-TypeInformation-extension CRITICALITY ignore  EXTENSION PDP-TypeInformation-extension PRESENCE optional } |
-- Extension for Release 12 to support Session re-establishment --
  { ID id-Session-Re-establishment-Indicator CRITICALITY ignore  EXTENSION Session-Re-establishment-Indicator PRESENCE optional } ,
  ...
}

MBMSsynchronisationInformation ::= SEQUENCE {
  mBMSHCIndicator      MBMSHCIndicator,
  iPMulticastAddress   IPMulticastAddress,
  gTPDLTEID           GTP-TEI,
  iE-Extensions        ProtocolExtensionContainer { {MBMSsynchronisationInformation-ExtIEs} }      OPTIONAL,
  ...
}

MBMSsynchronisationInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-IP-Source-Address      CRITICALITY reject  EXTENSION IPMulticastAddress      PRESENCE optional } ,
  ...
}

-- *****
--
-- MBMS Session Start Response
--
-- *****

MBMSSessionStartResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container { {MBMSSessionStartResponseIEs} } ,
  protocolExtensions  ProtocolExtensionContainer { {MBMSSessionStartResponseExtensions} }      OPTIONAL,
}
```

```

    ...
}

MBMSSessionStartResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TransportLayerInformation          CRITICALITY ignore TYPE TransportLayerInformation PRESENCE optional } |
    { ID id-Cause                             CRITICALITY ignore TYPE Cause                 PRESENCE optional } |
    { ID id-CriticalityDiagnostics            CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional } ,
    ...
}

MBMSSessionStartResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- MBMS Session Start Failure
--
-- *****

MBMSSessionStartFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { MBMSSessionStartFailureIEs } },
    protocolExtensions   ProtocolExtensionContainer { { MBMSSessionStartFailureExtensions } } OPTIONAL,
    ...
}

MBMSSessionStartFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                             CRITICALITY ignore TYPE Cause                 PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics            CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional } ,
    ...
}

MBMSSessionStartFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- MBMS SESSION UPDATE PROCEDURE
--
-- *****

--
-- MBMS Session Update
--
-- *****

MBMSSessionUpdate ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { MBMSSessionUpdateIEs } },
    protocolExtensions   ProtocolExtensionContainer { { MBMSSessionUpdateExtensions } } OPTIONAL,
    ...
}

```



```

SRVCC-CSKeysRequestIES RANAP-PROTOCOL-IES ::= {
    ...
}

SRVCC-CSKeysRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- SRVCC CS Keys Response
--
-- *****

SRVCC-CSKeysResponse ::= SEQUENCE {
    protocolIES          ProtocolIE-Container          { {SRVCC-CSKeysResponseIES} },
    protocolExtensions   ProtocolExtensionContainer    { {SRVCC-CSKeysResponseExtensions} } OPTIONAL,
    ...
}

SRVCC-CSKeysResponseIES RANAP-PROTOCOL-IES ::= {
    { ID id-IntegrityProtectionKey      CRITICALITY reject TYPE IntegrityProtectionKey   PRESENCE mandatory }|
    { ID id-EncryptionKey                CRITICALITY reject TYPE EncryptionKey           PRESENCE mandatory }|
    { ID id-SRVCC-Information             CRITICALITY reject TYPE SRVCC-Information     PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics        CRITICALITY ignore TYPE CriticalityDiagnostics  PRESENCE optional  }|
    ...
}

SRVCC-CSKeysResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- UE RADIO CAPABILITY MATCH PROCEDURE
--
-- *****

-- *****
--
-- UE Radio Capability Match Request
--
-- *****

UeRadioCapabilityMatchRequest ::= SEQUENCE {
    protocolIES          ProtocolIE-Container          { {UeRadioCapabilityMatchRequestIES} },
    protocolExtensions   ProtocolExtensionContainer    { {UeRadioCapabilityMatchRequestExtensions} } OPTIONAL,
    ...
}

UeRadioCapabilityMatchRequestIES RANAP-PROTOCOL-IES ::= {
    ...
}
    
```

```
UeRadioCapabilityMatchRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- UE Radio Capability Match Response
--
-- *****

UeRadioCapabilityMatchResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {UeRadioCapabilityMatchResponseIEs} },
  protocolExtensions   ProtocolExtensionContainer { {UeRadioCapabilityMatchResponseExtensions} }     OPTIONAL,
  ...
}

UeRadioCapabilityMatchResponseIEs RANAP-PROTOCOL-IES ::= {
  { ID id-VoiceSupportMatchIndicator          CRITICALITY reject  TYPE VoiceSupportMatchIndicator  PRESENCE mandatory  },
  ...
}

UeRadioCapabilityMatchResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- UE REGISTRATION QUERY PROCEDURE
--
-- *****

-- *****
--
-- UE Registration Query Request
--
-- *****

UeRegistrationQueryRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { {UeRegistrationQueryRequestIEs} },
  protocolExtensions   ProtocolExtensionContainer { {UeRegistrationQueryRequestExtensions} }     OPTIONAL,
  ...
}

UeRegistrationQueryRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-IuSigConId           CRITICALITY ignore  TYPE IuSignallingConnectionIdentifier  PRESENCE mandatory}|
  { ID id-PermanentNAS-UE-ID   CRITICALITY ignore  TYPE PermanentNAS-UE-ID               PRESENCE mandatory},
  ...
}

UeRegistrationQueryRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
```



```

}

Alt-RAB-Parameters ::= SEQUENCE {
    altMaxBitrateInf           Alt-RAB-Parameter-MaxBitrateInf           OPTIONAL,
    altGuaranteedBitRateInf    Alt-RAB-Parameter-GuaranteedBitrateInf    OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { {Alt-RAB-Parameters-ExtIEs} } OPTIONAL,
    ...
}

Alt-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to indicate an alternative RAB configuration --
    { ID id-AlternativeRABConfiguration    CRITICALITY ignore  EXTENSION RAB-Parameters    PRESENCE optional }|
-- Extension for Release 7 to indicate an alternative list of Extended Guaranteed Bitrates --
    { ID id-Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf    CRITICALITY ignore  EXTENSION Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf    PRESENCE optional }|
-- Extension for Release 7 to indicate an alternative list of Extended Maximum Bitrates --
    { ID id-Alt-RAB-Parameter-ExtendedMaxBitrateInf    CRITICALITY ignore  EXTENSION Alt-RAB-Parameter-ExtendedMaxBitrateInf    PRESENCE optional }|
-- Extension for Release 8 to indicate an alternative list of Supported Maximum Bitrates --
    { ID id-Alt-RAB-Parameter-SupportedMaxBitrateInf    CRITICALITY reject  EXTENSION Alt-RAB-Parameter-SupportedMaxBitrateInf    PRESENCE optional }|
-- Extension for Release 8 to indicate an alternative list of Supported Guaranteed Bitrates --
    { ID id-Alt-RAB-Parameter-SupportedGuaranteedBitrateInf    CRITICALITY reject  EXTENSION Alt-RAB-Parameter-SupportedGuaranteedBitrateInf    PRESENCE optional },
    ...
}

Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf ::= SEQUENCE {
    altExtendedGuaranteedBitrateType    Alt-RAB-Parameter-GuaranteedBitrateType,
    altExtendedGuaranteedBitrates       Alt-RAB-Parameter-ExtendedGuaranteedBitrates    OPTIONAL
    -- This IE shall be present if the Type of Extended Guaranteed Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    ...
}

Alt-RAB-Parameter-ExtendedGuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-ExtendedGuaranteedBitrateList

Alt-RAB-Parameter-ExtendedGuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedGuaranteedBitrate

Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
    altGuaranteedBitrateType            Alt-RAB-Parameter-GuaranteedBitrateType,
    altGuaranteedBitrates                Alt-RAB-Parameter-GuaranteedBitrates    OPTIONAL
    -- This IE shall be present if the Type of Guaranteed Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    ...
}

Alt-RAB-Parameter-GuaranteedBitrateType ::= ENUMERATED{
    unspecified,
    value-range,
    discrete-values,
    ...
}

Alt-RAB-Parameter-GuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-GuaranteedBitrateList

```

```

Alt-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

Alt-RAB-Parameter-SupportedGuaranteedBitrateInf ::= SEQUENCE {
    altSupportedGuaranteedBitrateType      Alt-RAB-Parameter-GuaranteedBitrateType,
    altSupportedGuaranteedBitrates         Alt-RAB-Parameter-SupportedGuaranteedBitrates      OPTIONAL
    -- This IE shall be present if the Type of Supported Guaranteed Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    iE-Extensions                          ProtocolExtensionContainer { { Alt-RAB-Parameter-SupportedGuaranteedBitrateInf-ExtIEs } } OPTIONAL,
    ...
}

Alt-RAB-Parameter-SupportedGuaranteedBitrateInf-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

Alt-RAB-Parameter-SupportedGuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    SupportedRAB-ParameterBitrateList

Alt-RAB-Parameter-ExtendedMaxBitrateInf ::= SEQUENCE {
    altExtendedMaxBitrateType              Alt-RAB-Parameter-MaxBitrateType,
    altExtendedMaxBitrates                 Alt-RAB-Parameter-ExtendedMaxBitrates      OPTIONAL
    -- This IE shall be present if the Type of Extended Alternative Maximum Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    -,
    ...
}

Alt-RAB-Parameter-ExtendedMaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-ExtendedMaxBitrateList

Alt-RAB-Parameter-ExtendedMaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedMaxBitrate

Alt-RAB-Parameter-MaxBitrateInf ::= SEQUENCE {
    altMaxBitrateType                      Alt-RAB-Parameter-MaxBitrateType,
    altMaxBitrates                         Alt-RAB-Parameter-MaxBitrates      OPTIONAL
    -- This IE shall be present if the Type of Alternative Maximum Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    ...
}

Alt-RAB-Parameter-MaxBitrateType ::= ENUMERATED{
    unspecified,
    value-range,
    discrete-values,
    ...
}

Alt-RAB-Parameter-MaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-MaxBitrateList

Alt-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

Alt-RAB-Parameter-SupportedMaxBitrateInf ::= SEQUENCE {

```

```

altSupportedMaxBitrateType          Alt-RAB-Parameter-MaxBitrateType,
altSupportedMaxBitrates              Alt-RAB-Parameter-SupportedMaxBitrates          OPTIONAL
-- This IE shall be present if the Type of Supported Alternative Maximun Bit Rates Information IE is set to "Value range" or "Discrete values"
--,
  iE-Extensions                      ProtocolExtensionContainer { { Alt-RAB-Parameter-SupportedMaxBitrateInf-ExtIEs } }  OPTIONAL,
...
}

Alt-RAB-Parameter-SupportedMaxBitrateInf-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

Alt-RAB-Parameter-SupportedMaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
  SupportedRAB-ParameterBitrateList

AlternativeRABConfigurationRequest ::= ENUMERATED{
  alternative-RAB-configuration-Requested,
  ...
}

APN ::= OCTET STRING (SIZE (1..255))
-- Reference: 23.003

AreaIdentity ::= CHOICE {
  sAI                                SAI,
  geographicalArea                    GeographicalArea,
  ...
}

Ass-RAB-Parameters ::= SEQUENCE {
  assMaxBitrateInf                    Ass-RAB-Parameter-MaxBitrateList                OPTIONAL,
  assGuaranteedBitRateInf              Ass-RAB-Parameter-GuaranteedBitrateList          OPTIONAL,
  iE-Extensions                      ProtocolExtensionContainer { {Ass-RAB-Parameters-ExtIEs} }  OPTIONAL,
  ...
}

Ass-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate an extended assigned Guaranteed Bitrate --
  { ID id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList      CRITICALITY reject  EXTENSION Ass-RAB-Parameter-ExtendedGuaranteedBitrateList
  PRESENCE optional }|
-- Extension for Release 7 to indicate an extended assigned Maximum Bitrate --
  { ID id-Ass-RAB-Parameter-ExtendedMaxBitrateList              CRITICALITY reject  EXTENSION Ass-RAB-Parameter-ExtendedMaxBitrateList  PRESENCE
  optional }|
-- Extension for Release 8 to indicate an supported assigned Maximum Bitrate --
  { ID id-Ass-RAB-Parameter-SupportedMaxBitrateList            CRITICALITY ignore  EXTENSION SupportedRAB-ParameterBitrateList  PRESENCE optional }|
-- Extension for Release 8 to indicate an supported assigned Guaranteed Bitrate --
  { ID id-Ass-RAB-Parameter-SupportedGuaranteedBitrateList     CRITICALITY ignore  EXTENSION SupportedRAB-ParameterBitrateList  PRESENCE
  optional },
  ...
}

Ass-RAB-Parameter-ExtendedGuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedGuaranteedBitrate

```

```
Ass-RAB-Parameter-ExtendedMaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedMaxBitrate
```

```
Ass-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
```

```
Ass-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
```

```
AuthorisedPLMNs ::= SEQUENCE (SIZE (1..maxNrOfPLMNsSN)) OF  
  SEQUENCE {  
    PLMNidentity          PLMNidentity,  
    authorisedSNAsList    AuthorisedSNAs OPTIONAL,  
    iE-Extensions        ProtocolExtensionContainer { {AuthorisedPLMNs-ExtIEs} } OPTIONAL,  
    ...  
  }
```

```
AuthorisedPLMNs-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {  
  ...  
}
```

```
AuthorisedSNAs ::= SEQUENCE (SIZE (1..maxNrOfSNAs)) OF SNAC
```

```
-- B
```

```
BarometricPressure ::= INTEGER (30000..115000)
```

```
BindingID ::= OCTET STRING (SIZE (4))
```

```
BroadcastAssistanceDataDecipheringKeys ::= SEQUENCE {  
  cipheringKeyFlag      BIT STRING (SIZE (1)),  
  currentDecipheringKey BIT STRING (SIZE (56)),  
  nextDecipheringKey    BIT STRING (SIZE (56)),  
  ...  
}
```

```
-- C
```

```
Cause ::= CHOICE {  
  radioNetwork          CauseRadioNetwork,  
  transmissionNetwork  CauseTransmissionNetwork,  
  nAS                   CauseNAS,  
  protocol              CauseProtocol,  
  misc                  CauseMisc,  
  non-Standard         CauseNon-Standard,  
  ...  
  radioNetworkExtension CauseRadioNetworkExtension  
}
```

```
CauseMisc ::= INTEGER {  
  om-intervention (113),  
  no-resource-available (114),  
  unspecified-failure (115),  
}
```

```
    network-optimisation (116)
} (113..128)

CauseNAS ::= INTEGER {
    user-restriction-start-indication (81),
    user-restriction-end-indication (82),
    normal-release (83),
    csg-subscription-expiry(84)
} (81..96)

CauseProtocol ::= INTEGER {
    transfer-syntax-error (97),
    semantic-error (98),
    message-not-compatible-with-receiver-state (99),
    abstract-syntax-error-reject (100),
    abstract-syntax-error-ignore-and-notify (101),
    abstract-syntax-error-falsely-constructed-message (102)
} (97..112)

CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqeing-expiry (5),
    relocation-triggered (6),
    trllocalloc-expiry(7),
    unable-to-establish-during-relocation (8),
    unknown-target-rnc (9),
    relocation-cancelled (10),
    successful-relocation (11),
    requested-ciphering-and-or-integrity-protection-algorithms-not-supported (12),
    conflict-with-already-existing-integrity-protection-and-or-ciphering-information (13),
    failure-in-the-radio-interface-procedure (14),
    release-due-to-utran-generated-reason (15),
    user-inactivity (16),
    time-critical-relocation (17),
    requested-traffic-class-not-available (18),
    invalid-rab-parameters-value (19),
    requested-maximum-bit-rate-not-available (20),
    requested-guaranteed-bit-rate-not-available (21),
    requested-transfer-delay-not-achievable (22),
    invalid-rab-parameters-combination (23),
    condition-violation-for-sdu-parameters (24),
    condition-violation-for-traffic-handling-priority (25),
    condition-violation-for-guaranteed-bit-rate (26),
    user-plane-versions-not-supported (27),
    iu-up-failure (28),
    relocation-failure-in-target-CN-RNC-or-target-system(29),
    invalid-RAB-ID (30),
    no-remaining-rab (31),
    interaction-with-other-procedure (32),
    requested-maximum-bit-rate-for-dl-not-available (33),
    requested-maximum-bit-rate-for-ul-not-available (34),
```

```

requested-guaranteed-bit-rate-for-dl-not-available (35),
requested-guaranteed-bit-rate-for-ul-not-available (36),
repeated-integrity-checking-failure (37),
requested-request-type-not-supported (38),
request-superseded (39),
release-due-to-UE-generated-signalling-connection-release (40),
resource-optimisation-relocation (41),
requested-information-not-available (42),
relocation-desirable-for-radio-reasons (43),
relocation-not-supported-in-target-RNC-or-target-system (44),
directed-retry (45),
radio-connection-with-UE-Lost (46),
rNC-unable-to-establish-all-RFCs (47),
deciphering-keys-not-available(48),
dedicated-assistance-data-not-available(49),
relocation-target-not-allowed (50),
location-reporting-congestion (51),
reduce-load-in-serving-cell (52),
no-radio-resources-available-in-target-cell (53),
gERAN-Iumode-failure (54),
access-restricted-due-to-shared-networks (55),
incoming-relocation-not-supported-due-to-PUESBINE-feature (56),
traffic-load-in-the-target-cell-higher-than-in-the-source-cell (57),
mBMS-no-multicast-service-for-this-UE(58),
mBMS-unknown-UE-ID(59),
successful-MBMS-session-start-no-data-bearer-necessary(60),
mBMS-superseded-due-to-NNSF(61),
mBMS-UE-linking-already-done(62),
mBMS-UE-de-linking-failure-no-existing-UE-linking(63),
TMGI-unknown(64)
} (1..64)

CauseRadioNetworkExtension ::= INTEGER {
    iP-multicast-address-and-APN-not-valid(257),
    mBMS-de-registration-rejected-due-to-implicit-registration(258),
    mBMS-request-superseded(259),
    mBMS-de-registration-during-session-not-allowed(260),
    mBMS-no-data-bearer-necessary(261),
    periodicLocationInformationNotAvailable(262),
    gTP-Resources-Unavailable(263),
    TMGI-inUse-overlapping-MBMS-service-area(264),
    mBMS-no-cell-in-MBMS-service-area(265),
    no-Iu-CS-UP-relocation(266),
    successful-MBMS-Session-Start-IP-Multicast-Bearer-established(267),
    CS-fallback-triggered(268),
    invalid-CSG-Id(269)
} (257..512)

CauseNon-Standard ::= INTEGER (129..256)
-- Cause value 256 shall not be used --

CauseTransmissionNetwork ::= INTEGER {
    signalling-transport-resource-failure (65),
    iu-transport-connection-failed-to-establish (66)

```

```

} (65..80)

Cell-Access-Mode ::= ENUMERATED {
    hybrid,
    ...
}

CellBased ::= SEQUENCE {
    cellIdList          CellIdList,
    iE-Extensions      ProtocolExtensionContainer { {CellBased-ExtIEs} } OPTIONAL,
    ...
}

CellBased-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

CellIdList ::= SEQUENCE (SIZE (1..maxNrOfCellIds)) OF
    Cell-Id

Cell-Id      ::= INTEGER (0..268435455)

Cell-Capacity-Class-Value ::= INTEGER (1..100,...)

CellLoadInformation ::= SEQUENCE {
    cell-Capacity-Class-Value Cell-Capacity-Class-Value,
    loadValue                 LoadValue,
    rTLoadValue               RTLoadValue                OPTIONAL,
    nRTLoadInformationValue   NRTLoadInformationValue    OPTIONAL,
    iE-Extensions             ProtocolExtensionContainer { { CellLoadInformation-ExtIEs } } OPTIONAL,
    ...
}

CellLoadInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

CellLoadInformationGroup ::= SEQUENCE {
    sourceCellID             SourceCellID,
    uplinkCellLoadInformation CellLoadInformation        OPTIONAL,
    downlinkCellLoadInformation CellLoadInformation        OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { CellLoadInformationGroup-ExtIEs } } OPTIONAL,
    ...
}

CellLoadInformationGroup-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

CellType ::= ENUMERATED{
    macro,
    micro,
    pico,
    femto,

```

```

    ...
}

CivicAddress ::= OCTET STRING

ClientType ::= ENUMERATED {
    emergency-Services,
    value-Added-Services,
    pLMN-Operator-Services,
    lawful-Intercept-Services,
    pLMN-Operator-Broadcast-Services,
    pLMN-Operator-O-et-M,
    pLMN-Operator-Anonymous-Statistics,
    pLMN-Operator-Target-MS-Service-Support,
    ...
}

CriticalityDiagnostics ::= SEQUENCE {
    procedureCode          ProcedureCode          OPTIONAL,
    triggeringMessage      TriggeringMessage      OPTIONAL,
    procedureCriticality   Criticality             OPTIONAL,
    iEsCriticalityDiagnostics CriticalityDiagnostics-IE-List OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality          Criticality,
        iE-ID                  ProtocolIE-ID,
        repetitionNumber       RepetitionNumber0          OPTIONAL,
        iE-Extensions          ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable reporting the message structure down to the erroneous IE --
    { ID id-MessageStructure CRITICALITY ignore EXTENSION MessageStructure PRESENCE optional } |
-- Extension for Release 99 to enable reporting if a reported error is due to a not understood or a missing IE --
    { ID id-TypeOfError CRITICALITY ignore EXTENSION TypeOfError PRESENCE mandatory },
    ...
}

MessageStructure ::= SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                  ProtocolIE-ID,
        repetitionNumber       RepetitionNumber1          OPTIONAL,
        iE-Extensions          ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }

```

```
MessageStructure-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

CGI ::= SEQUENCE {
  pLMNidentity          PLMNidentity,
  lAC                   LAC,
  cI                    CI,
  iE-Extensions         ProtocolExtensionContainer { {CGI-ExtIEs} } OPTIONAL
}

CGI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  -- Extension for Release 6 to enable Inter-RAT PS Handover between UTRAN and GERAN A/Gb --
  { ID id-RAC  CRITICALITY ignore  EXTENSION RAC  PRESENCE optional },
  ...
}

ChosenEncryptionAlgorithm ::= EncryptionAlgorithm

ChosenIntegrityProtectionAlgorithm ::= IntegrityProtectionAlgorithm

CI ::= OCTET STRING (SIZE (2))

ClassmarkInformation2 ::= OCTET STRING

ClassmarkInformation3 ::= OCTET STRING

CN-DomainIndicator ::= ENUMERATED {
  cs-domain,
  ps-domain
}

CN-ID ::= INTEGER (0..4095)

Correlation-ID ::= OCTET STRING (SIZE (4))

CSFB-Information ::= ENUMERATED {
  csfb,
  csfb-high-priority,
  ...
}

CSG-Id ::= BIT STRING (SIZE (27))

CSG-Id-List ::= SEQUENCE (SIZE (1..maxNrOfCSGs)) OF
  CSG-Id

CSG-Membership-Status ::= ENUMERATED {
  member,
  non-member,
  ...
}
```

```

-- D

DataPDUType ::= ENUMERATED {
    pduType0,
    pduType1,
    ...
}

DataVolumeReference ::= INTEGER (0..255)

DataVolumeReportingIndication ::= ENUMERATED {
    do-report,
    do-not-report
}

DCH-ID ::= INTEGER (0..255)

DeliveryOfErroneousSDU ::= ENUMERATED {
    yes,
    no,
    no-error-detection-consideration
}

DeliveryOrder ::= ENUMERATED {
    delivery-order-requested,
    delivery-order-not-requested
}

DeltaRAListofIdleModeUEs ::= SEQUENCE {
    newRAListofIdleModeUEs          NewRAListofIdleModeUEs OPTIONAL,
    rAListwithNoIdleModeUEsAnyMore  RAListwithNoIdleModeUEsAnyMore OPTIONAL,
    IE-Extensions                   ProtocolExtensionContainer { {DeltaRAListofIdleModeUEs-ExtIEs} } OPTIONAL
}

NewRAListofIdleModeUEs ::= SEQUENCE (SIZE (1..maxMBMSRA)) OF
    RAC

RAListwithNoIdleModeUEsAnyMore ::= SEQUENCE (SIZE (1..maxMBMSRA)) OF
    RAC

DeltaRAListofIdleModeUEs-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-newLAListofIdleModeUEs          CRITICALITY reject EXTENSION LAListofIdleModeUEs          PRESENCE conditional }|
    -- This IE shall be present if the New RA List of Idle Mode UEs IE is included. --
    { ID id-LAListwithNoIdleModeUEsAnyMore  CRITICALITY reject EXTENSION LAListofIdleModeUEs          PRESENCE conditional },
    -- This IE shall be present if the RA List with No Idle Mode UEs Any More IE is included. --
    ...
}

ForwardingIndication ::= ENUMERATED {
    forwarding-admitted,
    ...
}

DL-GTP-PDU-SequenceNumber ::= INTEGER (0..65535)

```

```
DL-N-PDU-SequenceNumber ::= INTEGER (0..65535)

D-RNTI ::= INTEGER (0..1048575)

DRX-CycleLengthCoefficient ::= INTEGER (6..9)

DSCH-ID ::= INTEGER (0..255)

-- E

EARFCN-Extended ::= INTEGER (65536..262143, ...)

E-DCH-MAC-d-Flow-ID ::= INTEGER (0.. maxNrOfEDCHMACdFlows-1)

ENB-ID ::= CHOICE {
    macroENB-ID BIT STRING (SIZE(20)),
    homeENB-ID BIT STRING (SIZE(28)),
    ...
}

EncryptionAlgorithm ::= INTEGER { no-encryption (0), standard-UMTS-encryption-algorithm-UEA1 (1), standard-UMTS-encryption-algorithm-UEA2 (2) } (0..15)

EncryptionInformation ::= SEQUENCE {
    permittedAlgorithms PermittedEncryptionAlgorithms,
    key EncryptionKey,
    iE-Extensions ProtocolExtensionContainer { {EncryptionInformation-ExtIEs} } OPTIONAL
}

EncryptionInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

EncryptionKey ::= BIT STRING (SIZE (128))
-- Reference: 33.102

End-Of-CSFB ::= ENUMERATED{
    end-of-CSFB,
    ...
}

EquipmentsToBeTraced ::= CHOICE {
    iMEIlist IMEIList,
    iMEISVlist IMEISVList,
    iMEIGroup IMEIGroup,
    iMEISVgroup IMEISVGroup,
    ...
}

E-UTRAN-Service-Handover ::= ENUMERATED {
    handover-to-E-UTRAN-shall-not-be-performed,
    ...
}
```

```

}

Event ::= ENUMERATED {
    stop-change-of-service-area,
    direct,
    change-of-servicearea,
    ...,
    stop-direct,
    periodic,
    stop-periodic
}

Event1F-Parameters ::= SEQUENCE {
    measurementQuantity MeasurementQuantity,
    threshold            INTEGER(-120..165),
    ...
}

Event1I-Parameters ::= SEQUENCE {
    threshold            INTEGER(-120..-25),
    ...
}

ExtendedGuaranteedBitrate ::= INTEGER (16000001..256000000)
-- Unit is bits per sec

ExtendedMaxBitrate ::= INTEGER (16000001..256000000)
-- Unit is bits per sec

ExtendedRNC-ID ::= INTEGER (4096..65535)

-- F

FrameSequenceNumber ::= INTEGER(0..15)

FrequencyLayerConvergenceFlag ::= ENUMERATED {
    no-FLC-flag,
    ...
}

-- G

GANSS-PositioningDataSet ::= SEQUENCE(SIZE(1..maxGANSSSet)) OF GANSS-PositioningMethodAndUsage

GANSS-PositioningMethodAndUsage ::= OCTET STRING (SIZE(1))

GeographicalArea ::= CHOICE {
    point GA-Point,
    pointWithUncertainty GA-PointWithUncertainty,
    polygon GA-Polygon,
    ...,
    pointWithUncertaintyEllipse GA-PointWithUncertaintyEllipse,
    pointWithAltitude GA-PointWithAltitude,
    pointWithAltitudeAndUncertaintyEllipsoid GA-PointWithAltitudeAndUncertaintyEllipsoid,

```

```

    ellipsoidArc      GA-EllipsoidArc
  }

GeographicalCoordinates ::= SEQUENCE {
    latitudeSign      ENUMERATED { north, south },
    latitude          INTEGER (0..8388607),
    longitude         INTEGER (-8388608..8388607),
    iE-Extensions    ProtocolExtensionContainer { {GeographicalCoordinates-ExtIEs} } OPTIONAL,
    ...
}

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

GA-AltitudeAndDirection ::= SEQUENCE {
    directionOfAltitude  ENUMERATED {height, depth},
    altitude             INTEGER (0..32767),
    ...
}

GA-EllipsoidArc ::= SEQUENCE {
    geographicalCoordinates  GeographicalCoordinates,
    innerRadius              INTEGER (0..65535),
    uncertaintyRadius        INTEGER (0..127),
    offsetAngle              INTEGER (0..179),
    includedAngle            INTEGER (0..179),
    confidence                INTEGER (0..127),
    iE-Extensions            ProtocolExtensionContainer { { GA-EllipsoidArc-ExtIEs} } OPTIONAL,
    ...
}

GA-EllipsoidArc-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

GA-Point ::= SEQUENCE {
    geographicalCoordinates  GeographicalCoordinates,
    iE-Extensions            ProtocolExtensionContainer { {GA-Point-ExtIEs} } OPTIONAL,
    ...
}

GA-Point-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

GA-PointWithAltitude ::= SEQUENCE {
    geographicalCoordinates  GeographicalCoordinates,
    altitudeAndDirection    GA-AltitudeAndDirection,
    iE-Extensions            ProtocolExtensionContainer { { GA-PointWithAltitude-ExtIEs} } OPTIONAL,
    ...
}

GA-PointWithAltitude-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {

```

```

}
...
}
GA-PointWithAltitudeAndUncertaintyEllipsoid ::= SEQUENCE {
    geographicalCoordinates    GeographicalCoordinates,
    altitudeAndDirection      GA-AltitudeAndDirection,
    uncertaintyEllipse         GA-UncertaintyEllipse,
    uncertaintyAltitude        INTEGER (0..127),
    confidence                  INTEGER (0..127),
    iE-Extensions              ProtocolExtensionContainer { { GA-PointWithAltitudeAndUncertaintyEllipsoid-ExtIEs } } OPTIONAL,
    ...
}
GA-PointWithAltitudeAndUncertaintyEllipsoid-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
GA-PointWithUnCertainty ::= SEQUENCE {
    geographicalCoordinates    GeographicalCoordinates,
    iE-Extensions              ProtocolExtensionContainer { {GA-PointWithUnCertainty-ExtIEs} } OPTIONAL,
    uncertaintyCode            INTEGER (0..127)
}
GA-PointWithUnCertainty-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
GA-PointWithUnCertaintyEllipse ::= SEQUENCE {
    geographicalCoordinates    GeographicalCoordinates,
    uncertaintyEllipse         GA-UncertaintyEllipse,
    confidence                  INTEGER (0..127),
    iE-Extensions              ProtocolExtensionContainer { { GA-PointWithUnCertaintyEllipse-ExtIEs } } OPTIONAL,
    ...
}
GA-PointWithUnCertaintyEllipse-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
GA-Polygon ::= SEQUENCE (SIZE (1..maxNrOfPoints)) OF
    SEQUENCE {
        geographicalCoordinates    GeographicalCoordinates,
        iE-Extensions              ProtocolExtensionContainer { {GA-Polygon-ExtIEs} } OPTIONAL,
        ...
    }
GA-Polygon-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
GA-UncertaintyEllipse ::= SEQUENCE {
    uncertaintySemi-major        INTEGER (0..127),
    uncertaintySemi-minor        INTEGER (0..127),
    orientationOfMajorAxis       INTEGER (0..179), -- The values 90..179 shall not be used.
}

```

```
    ...
}

GERAN-BSC-Container ::= OCTET STRING
-- GERAN BSC Container as defined in TS 48.008 [11] --

GERAN-Cell-ID ::= SEQUENCE {
    LAI LAI,
    rAC RAC,
    cI CI,
    iE-Extensions ProtocolExtensionContainer { {GERAN-Cell-ID-ExtIEs} } OPTIONAL
}

GERAN-Cell-ID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

GERAN-Classmark ::= OCTET STRING
-- GERAN Classmark as defined in TS 48.008 [11] --

GlobalCN-ID ::= SEQUENCE {
    pLMNidentity PLMNidentity,
    cN-ID CN-ID
}

GlobalRNC-ID ::= SEQUENCE {
    pLMNidentity PLMNidentity,
    rNC-ID RNC-ID
}

GTP-TEI ::= OCTET STRING (SIZE (4))

GuaranteedBitrate ::= INTEGER (0..16000000)
-- Unit is bits per sec

-- H

HigherBitratesThan16MbpsFlag ::= ENUMERATED{
    allowed,
    not-allowed,
    ...
}

HS-DSCH-MAC-d-Flow-ID ::= INTEGER (0.. maxNrOfHSDSCHMACdFlows-1)

-- I

IMEI ::= OCTET STRING (SIZE (8))
-- Reference: 23.003

IMEIGroup ::= SEQUENCE {
```

```

    iMEI                IMEI,
    iMEIMask            BIT STRING (SIZE (7)),
    iE-Extensions      ProtocolExtensionContainer { { IMEIGroup-ExtIEs } } OPTIONAL
}

IMEIGroup-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

IMEIList ::= SEQUENCE (SIZE (1..maxNrOfUEsToBeTraced)) OF IMEI

IMEISV ::= OCTET STRING (SIZE (8))
-- Reference: 23.003

IMEISVGroup ::= SEQUENCE {
    iMEISV            IMEISV,
    iMEISVMask       BIT STRING (SIZE (7)),
    iE-Extensions    ProtocolExtensionContainer { { IMEISVGroup-ExtIEs } } OPTIONAL
}

IMEISVGroup-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

IMEISVList ::= SEQUENCE (SIZE (1..maxNrOfUEsToBeTraced)) OF IMEISV

ImmediateMDT ::= SEQUENCE {
    measurementsToActivate MeasurementsToActivate,
    m1report              M1Report              OPTIONAL,
    -- Included in case of event-triggered reporting for measurement M1
    m2report              M2Report              OPTIONAL,
    -- Included in case of event-triggered reporting for measurement M2
    ...,
    iE-Extensions        ProtocolExtensionContainer { { ImmediateMDT-ExtIEs } } OPTIONAL
}

ImmediateMDT-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    {ID id-M4Report      CRITICALITY ignore EXTENSION M4Report      PRESENCE optional}|
    -- Included in case that measurement M4 is activated
    {ID id-M5Report      CRITICALITY ignore EXTENSION M5Report      PRESENCE optional}|
    -- Included in case that measurement M5 is activated
    {ID id-M6Report      CRITICALITY ignore EXTENSION M6Report      PRESENCE optional}|
    -- Included in case that measurement M6 is activated
    {ID id-M7Report      CRITICALITY ignore EXTENSION M7Report      PRESENCE optional},
    -- Included in case that measurement M7 is activated
    ...
}

IMSI ::= TBCD-STRING (SIZE (3..8))
-- Reference: 23.003

IncludeVelocity ::= ENUMERATED {
    requested
}

```

```

InformationExchangeID ::= INTEGER (0.. 1048575)

InformationExchangeType ::= ENUMERATED {
    transfer,
    request,
    ...
}

InformationRequested ::= CHOICE {
    requestedMBMSIPMulticastAddressandAPNRequest      RequestedMBMSIPMulticastAddressandAPNRequest,
    requestedMulticastServiceList                    RequestedMulticastServiceList,
    ...
}

InformationRequestType ::= CHOICE {
    mBMSIPMulticastAddressandAPNRequest      MBMSIPMulticastAddressandAPNRequest,
    permanentNAS-UE-ID                      PermanentNAS-UE-ID,
    ...
}

InformationTransferID ::= INTEGER (0.. 1048575)

InformationTransferType ::= CHOICE {
    rNCTraceInformation      RNCTraceInformation,
    ...
}

IntegrityProtectionAlgorithm ::= INTEGER {
    standard-UMTS-integrity-algorithm-UIA1 (0), standard-UMTS-integrity-algorithm-UIA2 (1),
    no-value (15)
} (0..15)

IntegrityProtectionInformation ::= SEQUENCE {
    permittedAlgorithms      PermittedIntegrityProtectionAlgorithms,
    key                      IntegrityProtectionKey,
    iE-Extensions           ProtocolExtensionContainer { {IntegrityProtectionInformation-ExtIEs} } OPTIONAL
}

IntegrityProtectionInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

IntegrityProtectionKey ::= BIT STRING (SIZE (128))

InterSystemInformationTransferType ::= CHOICE {
    rIM-Transfer      RIM-Transfer,
    ...
}

InterSystemInformation-TransparentContainer ::= SEQUENCE {
    downlinkCellLoadInformation      CellLoadInformation      OPTIONAL,
    uplinkCellLoadInformation        CellLoadInformation        OPTIONAL,
}

```

```

    iE-Extensions          ProtocolExtensionContainer { { InterSystemInformation-TransparentContainer-ExtIEs } } OPTIONAL,
    ...
}

InterSystemInformation-TransparentContainer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

IPMulticastAddress ::= OCTET STRING (SIZE (4..16))
-- Reference: 23.003

IuSignallingConnectionIdentifier ::= BIT STRING (SIZE (24))

IuTransportAssociation ::= CHOICE {
    gTP-TEI                GTP-TEI,
    bindingID              BindingID,
    ...
}

-- J
-- K

KeyStatus ::= ENUMERATED {
    old,
    new,
    ...
}

-- L

LA-LIST ::= SEQUENCE (SIZE (1..maxNrOfLAs)) OF
    SEQUENCE {
        LAC                LAC,
        listOF-SNAs        ListOF-SNAs,
        iE-Extensions      ProtocolExtensionContainer { { LA-LIST-ExtIEs } } OPTIONAL,
        ...
    }

LA-LIST-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LAC ::= OCTET STRING (SIZE (2))

LAI ::= SEQUENCE {
    pLMNidentity           PLMNidentity,
    LAC                   LAC,
    iE-Extensions         ProtocolExtensionContainer { { LAI-ExtIEs } } OPTIONAL
}

LAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LastKnownServiceArea ::= SEQUENCE {

```

```

    sAI          SAI,
    ageOfSAI     INTEGER (0..32767),
    iE-Extensions ProtocolExtensionContainer { {LastKnownServiceArea-ExtIEs} } OPTIONAL,
    ...
}

LastKnownServiceArea-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LastVisitedUTRANCell-Item ::= SEQUENCE {
    uTRAN-CellID          UTRAN-CellID,
    cellType              CellType,
    time-UE-StayedInCell Time-UE-StayedInCell,
    iE-Extensions        ProtocolExtensionContainer { {LastVisitedUTRANCell-Item-ExtIEs} } OPTIONAL,
    ...
}

LastVisitedUTRANCell-Item-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Rel-11 to support enhanced granularity for time UE stayed in cell --
    { ID id-Time-UE-StayedInCell-EnhancedGranularity  CRITICALITY ignore  EXTENSION Time-UE-StayedInCell-EnhancedGranularity  PRESENCE optional
    }|
    { ID id-HO-Cause                                CRITICALITY ignore  EXTENSION Cause                                PRESENCE optional
    },
    ...
}

LHN-ID ::= OCTET STRING (SIZE (32..256))

Links-to-log ::= ENUMERATED {uplink, downlink, both-uplink-and-downlink, ...}

ListOF-SNAs ::= SEQUENCE (SIZE (1..maxNrOfSNAs)) OF SNAC

ListOfInterfacesToTrace ::= SEQUENCE (SIZE (1..maxNrOfInterfaces)) OF InterfacesToTraceItem

InterfacesToTraceItem ::= SEQUENCE {
    interface          ENUMERATED {iu-cs, iu-ps, iur, iub, uu, ...},
    iE-Extensions      ProtocolExtensionContainer { {InterfacesToTraceItem-ExtIEs} } OPTIONAL,
    ...
}

InterfacesToTraceItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LoadValue ::= INTEGER (0..100)

LocationRelatedDataRequestType ::= SEQUENCE {
    requestedLocationRelatedDataType RequestedLocationRelatedDataType,
    requestedGPSAssistanceData       RequestedGPSAssistanceData OPTIONAL,
-- This IE shall be present if the Requested Location Related Data Type IE is set to "Dedicated Assistance Data for Assisted GPS" or
-- `Dedicated Assistance Data for Assisted GPS and GANSS"
    ...
}

```

```

LocationRelatedDataRequestTypeSpecificToGERANIuMode ::= ENUMERATED {
    decipheringKeysEOTD,
    dedicatedMobileAssistedEOTDAssistanceData,
    dedicatedMobileBasedEOTDAssistanceData,
    ...
}

LocationReportingTransferInformation ::= SEQUENCE {
    reportChangeOfSAI          ReportChangeOfSAI          OPTIONAL,
    periodicReportingIndicator  PeriodicReportingIndicator OPTIONAL,
    directReportingIndicator    DirectReportingIndicator    OPTIONAL,
    verticalAccuracyCode        VerticalAccuracyCode        OPTIONAL,
    positioningPriorityChangeSAI PositioningPriority      OPTIONAL,
    positioningPriorityDirect    PositioningPriority      OPTIONAL,
    clientTypePeriodic          ClientType              OPTIONAL,
    clientTypeDirect            ClientType              OPTIONAL,
    responseTime                ResponseTime            OPTIONAL,
    includeVelocity             IncludeVelocity        OPTIONAL,
    periodicLocationInfo        PeriodicLocationInfo    OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { LocationReportingTransferInformation-ExtIEs } } OPTIONAL,
    ...
}

LocationReportingTransferInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

ReportChangeOfSAI ::= ENUMERATED {
    requested,
    ...
}

PeriodicReportingIndicator ::= ENUMERATED {
    periodicSAI,
    periodicGeo,
    ...
}

DirectReportingIndicator ::= ENUMERATED {
    directSAI,
    directGeo,
    ...
}

L3-Information ::= OCTET STRING

-- M

M1Report ::= CHOICE {
    periodic      MDT-Report-Parameters,
    event1F      Event1F-Parameters,
    ...
}

```

```
M2Report ::= CHOICE {
    periodic      MDT-Report-Parameters,
    event1I      Event1I-Parameters,
    ...
}

M4Report ::= CHOICE {
    all           NULL,
    m4-collection-parameters M4-Collection-Parameters,
    ...
}

M4-Collection-Parameters ::= SEQUENCE {
    m4-period      M4-Period,
    m4-threshold   M4-Threshold OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { M4-Collection-Parameters-ExtIEs } } OPTIONAL,
    ...
}

M4-Collection-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

M4-Period ::= ENUMERATED {ms100, ms250, ms500, ms1000, ms2000, ms3000, ms4000, ms6000, ...}

M4-Threshold ::= INTEGER (0..31)

M5Report ::= CHOICE {
    when-available NULL,
    m5-period      M5-Period,
    ...
}

M5-Period ::= ENUMERATED {ms100, ms250, ms500, ms1000, ms2000, ms3000, ms4000, ms6000, ...}

M6Report ::= SEQUENCE {
    m6-period      M6-Period,
    m6-links-to-log Links-to-log,
    iE-Extensions ProtocolExtensionContainer { { M6Report-ExtIEs } } OPTIONAL,
    ...
}

M6Report-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

M6-Period ::= ENUMERATED {ms1000, ms2000, ms3000, ms4000, ms6000, ms8000, ms12000, ms16000, ms20000, ms24000, ms28000, ms32000, ms64000, ...}

M7Report ::= SEQUENCE {
    m7-period      M7-Period,
```

```
m7-links-to-log      Links-to-log,
iE-Extensions        ProtocolExtensionContainer { { M7Report-ExtIEs } } OPTIONAL,
...
}

M7Report-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

M7-Period ::= ENUMERATED {ms1000, ms2000, ms3000, ms4000, ms6000, ms8000, ms12000, ms16000, ms20000, ms24000, ms28000, ms32000, ms64000, ...}

Management-Based-MDT-Allowed ::= ENUMERATED {
    allowed, ... }

MaxBitrate           ::= INTEGER (1..16000000)
-- Unit is bits per sec

MaxSDU-Size          ::= INTEGER (0..32768)
-- MaxSDU-Size
-- Unit is bit

MBMS-PTP-RAB-ID ::= BIT STRING (SIZE (8))

MBMSBearerServiceType ::= ENUMERATED {
    multicast,
    broadcast,
    ...
}

MBMSCNDe-Registration ::= ENUMERATED {
    normalsessionstop,
    deregister,
    ...
}

MBMSCountingInformation ::= ENUMERATED {
    counting,
    notcounting,
    ...
}

MBMSHCIndicator ::= ENUMERATED {
    uncompressed-header,
    compressed-header,
    ...
}

MBMSIPMulticastAddressandAPNRequest ::= SEQUENCE (SIZE (1..maxnoofMulticastServicesPerRNC)) OF
    TMGI

MBMSLinkingInformation ::= ENUMERATED {
    uE-has-joined-multicast-services,
    ...
}
```

```

}
MBMSRegistrationRequestType ::= ENUMERATED {
    register,
    deregister,
    ...
}
MBMSServiceArea ::= OCTET STRING
MBMSSessionDuration ::= OCTET STRING (SIZE (3))

MBMSSessionIdentity ::= OCTET STRING (SIZE (1))
MBMSSessionRepetitionNumber ::= OCTET STRING (SIZE (1))
MDT-Activation ::= ENUMERATED { immediateMDTonly,
    loggedMDTonly,
    immediateMDTandTrace,
    ... }

MDTAreaScope ::= CHOICE {
    cellbased CellBased,
    labased LABased,
    rabased RABased,
    plmn-area-based NULL,
    ...
}

MDT-Configuration ::= SEQUENCE {
    mdtActivation MDT-Activation,
    mdtAreaScope MDTAreaScope,
    mdtMode MDTMode,
    iE-Extensions ProtocolExtensionContainer { { MDT-Configuration-ExtIEs } } OPTIONAL,
    ...
}

MDT-Configuration-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-SignallingBasedMDTPLMNList CRITICALITY ignore EXTENSION MDT-PLMN-List PRESENCE optional },
    ...
}

MDTMode ::= CHOICE {
    immediateMDT ImmediateMDT,
    loggedMDT LoggedMDT,
    ...
}

MDT-PLMN-List ::= SEQUENCE (SIZE (1..maxnoofMDTPLMNs)) OF
    PLMNidentity

MDT-Report-Parameters ::= SEQUENCE {

```

```
    reportInterval      ReportInterval,
    reportAmount        ReportAmount,
    ...
}

MeasurementQuantity ::= ENUMERATED {
    cpichEcNo,
    cpichRSCP,
    pathloss,
    ...
}

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

MSISDN ::= OCTET STRING (SIZE (1..9))

-- N

NAS-PDU ::= OCTET STRING

NAS-SequenceNumber ::= BIT STRING (SIZE (2))
-- Reference: 24.008

NAS-SynchronisationIndicator ::= BIT STRING (SIZE (4))

NewBSS-To-OldBSS-Information ::= OCTET STRING

NonSearchingIndication ::= ENUMERATED {
    non-searching,
    searching
}

NRI ::= BIT STRING (SIZE (10))

NRTLInformationValue ::= INTEGER (0..3)

Null-NRI ::= BIT STRING (SIZE (10))

NumberOfIuInstances ::= INTEGER (1..2)

NumberOfSteps ::= INTEGER (1..16)

-- O

Offload-RAB-Parameters ::= SEQUENCE {
    accessPointName      Offload-RAB-Parameters-APN,
    chargingCharacteristics Offload-RAB-Parameters-ChargingCharacteristics,
    iE-Extensions        ProtocolExtensionContainer { { Offload-RAB-Parameters-ExtIEs} } OPTIONAL,
    ...
}

Offload-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
}
Offload-RAB-Parameters-APN ::= OCTET STRING (SIZE (1..255))
Offload-RAB-Parameters-ChargingCharacteristics ::= OCTET STRING (SIZE (2))
OldBSS-ToNewBSS-Information ::= OCTET STRING
OMC-ID ::= OCTET STRING (SIZE (3..22))
-- Reference: GSM TS 12.20 [25]
Out-Of-UTRAN ::= ENUMERATED{
    cell-reselection-to-EUTRAN,
    ...
}
-- P
PagingAreaID ::= CHOICE {
    LAI LAI,
    rAI RAI,
    ...
}
PagingCause ::= ENUMERATED {
    terminating-conversational-call,
    terminating-streaming-call,
    terminating-interactive-call,
    terminating-background-call,
    terminating-low-priority-signalling,
    ...,
    terminating-high-priority-signalling
}
PDP-TypeInformation ::= SEQUENCE (SIZE (1..maxNrOfPDPDirections)) OF
    PDP-Type
PDP-Type ::= ENUMERATED {
    empty,
    PPP,
    osp-ihoss -- this value shall not be used -- ,
    ipv4,
    ipv6,
    ...
}
PDP-TypeInformation-extension ::= SEQUENCE (SIZE (1..maxNrOfPDPDirections)) OF
    PDP-Type-extension
PDP-Type-extension ::= ENUMERATED {
    ipv4-and-ipv6,
    ...
}
PDUType14FrameSequenceNumber ::= INTEGER(0..3)
```

```

PeriodicLocationInfo ::= SEQUENCE {
    reportingAmount          INTEGER (1..8639999, ...),
    reportingInterval        INTEGER (1..8639999, ...),
    iE-Extensions            ProtocolExtensionContainer { { PeriodicLocationInfo-ExtIEs } } OPTIONAL,
    ...
}

PeriodicLocationInfo-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

PermanentNAS-UE-ID ::= CHOICE {
    IMSI                     IMSI,
    ...
}

PermittedEncryptionAlgorithms ::= SEQUENCE (SIZE (1..16)) OF
    EncryptionAlgorithm

PermittedIntegrityProtectionAlgorithms ::= SEQUENCE (SIZE (1..16)) OF
    IntegrityProtectionAlgorithm

LABased ::= SEQUENCE {
    laiList                  LAI-List,
    iE-Extensions            ProtocolExtensionContainer { {LABased-ExtIEs} } OPTIONAL,
    ...
}

LABased-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LAI-List ::= SEQUENCE (SIZE (1..maxNrOfLAIs)) OF
    LAI

LoggedMDT ::= SEQUENCE {
    loggingInterval          LoggingInterval,
    loggingDuration           LoggingDuration,
    iE-Extensions            ProtocolExtensionContainer { {LoggedMDT-ExtIEs} } OPTIONAL,
    ...
}

LoggedMDT-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

LoggingInterval ::= ENUMERATED {
    s1d28,
    s2d56,
}

```

```

s5d12,
s10d24,
s20d48,
s30d72,
s40d96,
s61d44,
...
}

LoggingDuration ::= ENUMERATED {
    min10,
    min20,
    min40,
    min60,
    min90,
    min120,
...}

PLMNIdentity ::= TBCD-STRING (SIZE (3))

PLMNs-in-shared-network ::= SEQUENCE (SIZE (1..maxNrOfPLMNsSN)) OF
    SEQUENCE {
        pLMNIdentity          PLMNIdentity,
        lA-LIST                LA-LIST,
        iE-Extensions         ProtocolExtensionContainer { { PLMNs-in-shared-network-ExtIEs } } OPTIONAL,
        ...
    }

PLMNs-in-shared-network-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

Port-Number ::= OCTET STRING (SIZE (2))

PositioningDataDiscriminator ::= BIT STRING (SIZE(4))

PositioningDataSet ::= SEQUENCE(SIZE(1..maxSet)) OF PositioningMethodAndUsage

PositioningMethodAndUsage ::= OCTET STRING (SIZE(1))

PositioningPriority ::= ENUMERATED {
    high-Priority,
    normal-Priority,
    ...
}

PositionData ::= SEQUENCE {
    positioningDataDiscriminator      PositioningDataDiscriminator,
    positioningDataSet                PositioningDataSet          OPTIONAL,
    -- This IE shall be present if the PositioningDataDiscriminator IE is set to the value "0000" --
    iE-Extensions                     ProtocolExtensionContainer { {PositionData-ExtIEs} } OPTIONAL,
    ...
}

```

```

}

PositionData-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-GANSS-PositioningDataSet          CRITICALITY ignore EXTENSION GANSS-PositioningDataSet          PRESENCE optional} |
  { ID id-Additional-PositioningDataSet     CRITICALITY ignore EXTENSION Additional-PositioningDataSet     PRESENCE optional},
  ...
}

PositionDataSpecificToGERANIuMode ::= OCTET STRING

Pre-emptionCapability ::= ENUMERATED {
  shall-not-trigger-pre-emption,
  may-trigger-pre-emption
}

Pre-emptionVulnerability ::= ENUMERATED {
  not-pre-emptable,
  pre-emptable
}

PriorityLevel ::= INTEGER { spare (0), highest (1), lowest (14), no-priority (15) } (0..15)

Priority-Class-Indicator ::= BIT STRING (SIZE(8))

ProvidedData ::= CHOICE {
  shared-network-information          Shared-Network-Information,
  ...
}

PowerSavingIndicator ::= ENUMERATED {
  psmConfigured,
  eDRXConfigured,
  ...
}

P-TMSI ::= OCTET STRING (SIZE (4))

-- Q

QueuingAllowed ::= ENUMERATED {
  queueing-not-allowed,
  queueing-allowed
}

-- R
RAB-AsymmetryIndicator ::= ENUMERATED {
  symmetric-bidirectional,
  asymmetric-unidirectional-downlink,
  asymmetric-unidirectional-uplink,
  asymmetric-bidirectional,
  ...
}

RABased ::= SEQUENCE {

```

```

    raiList      RAI-List,
    iE-Extensions ProtocolExtensionContainer { {RABased-ExtIEs} } OPTIONAL,
    ...
}

RABased-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAI-List ::= SEQUENCE (SIZE (1..maxNrOfRAIs)) OF
    RAI

RABDataVolumeReport ::= SEQUENCE (SIZE (1..maxNrOfVol)) OF
    SEQUENCE {
        dl-UnsuccessfullyTransmittedDataVolume UnsuccessfullyTransmittedDataVolume,
        dataVolumeReference DataVolumeReference OPTIONAL,
        iE-Extensions ProtocolExtensionContainer { {RABDataVolumeReport-ExtIEs} } OPTIONAL,
        ...
    }

RABDataVolumeReport-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ID ::= BIT STRING (SIZE (8))

RAB-Parameter-ExtendedGuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedGuaranteedBitrate

RAB-Parameter-ExtendedMaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedMaxBitrate

RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
--This IE shall be ignored if Supported Guaranteed Bit rate is present--

RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
--This IE shall be ignored if Supported Maximum Bit rate is present--

RAB-Parameters ::= SEQUENCE {
    trafficClass TrafficClass,
    rAB-AsymmetryIndicator RAB-AsymmetryIndicator,
    maxBitrate RAB-Parameter-MaxBitrateList,
    guaranteedBitRate RAB-Parameter-GuaranteedBitrateList OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    deliveryOrder DeliveryOrder,
    maxSDU-Size MaxSDU-Size,
    sDU-Parameters SDU-Parameters,
    transferDelay TransferDelay OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    trafficHandlingPriority TrafficHandlingPriority OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Interactive" --,
    allocationOrRetentionPriority AllocationOrRetentionPriority OPTIONAL,
    sourceStatisticsDescriptor SourceStatisticsDescriptor OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,

```

```

relocationRequirement RelocationRequirement OPTIONAL,
iE-Extensions ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
...
}

RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable indication that Interactive User Plane data is of a signalling nature --
{ ID id-SignallingIndication CRITICALITY ignore EXTENSION SignallingIndication PRESENCE optional }|
-- Extension for Release 7 to indicate an Extended Guaranteed Bitrate --
{ ID id-RAB-Parameter-ExtendedGuaranteedBitrateList CRITICALITY reject EXTENSION RAB-Parameter-ExtendedGuaranteedBitrateList PRESENCE optional }|
-- Extension for Release 7 to indicate an Extended Maximum Bitrate --
{ ID id-RAB-Parameter-ExtendedMaxBitrateList CRITICALITY reject EXTENSION RAB-Parameter-ExtendedMaxBitrateList PRESENCE optional }|
-- Extension for Release 8 to indicate an Supported Maximum Bitrate --
{ ID id-RAB-Parameter-SupportedMaxBitrateList CRITICALITY reject EXTENSION SupportedRAB-ParameterBitrateList PRESENCE optional }|
-- Extension for Release 8 to indicate an Supported Guaranteed Bitrate --
{ ID id-RAB-Parameter-SupportedGuaranteedBitrateList CRITICALITY reject EXTENSION SupportedRAB-ParameterBitrateList PRESENCE optional },
...
}

RABParametersList ::= SEQUENCE (SIZE (1.. maxNrOfRABs)) OF SEQUENCE {
rab-Id RAB-ID,
cn-domain CN-DomainIndicator,
rabDataVolumeReport RABDataVolumeReport OPTIONAL,
upInformation UPInformation OPTIONAL,
iE-Extensions ProtocolExtensionContainer { { RABParametersList-ExtIEs } } OPTIONAL,
...
}

RABParametersList-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

RAB-SubflowCombinationBitRate ::= INTEGER (0..16000000)

RAB-TrCH-Mapping ::= SEQUENCE ( SIZE (1..maxNrOfRABs)) OF
RAB-TrCH-MappingItem

RAB-TrCH-MappingItem ::= SEQUENCE {
rAB-ID RAB-ID,
trCH-ID-List TrCH-ID-List,
iE-Extensions ProtocolExtensionContainer { { RAB-TrCH-MappingItem-ExtIEs } } OPTIONAL,
...
}

RAB-TrCH-MappingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable transfer of RAB Subflow mapping onto Iur transport channel Ids for a given indicated domain --
{ ID id-CN-DomainIndicator CRITICALITY ignore EXTENSION CN-DomainIndicator PRESENCE optional },
...
}

RAC ::= OCTET STRING (SIZE (1))

RAI ::= SEQUENCE {

```

```

    LAI                LAI,
    rAC                RAC,
    iE-Extensions      ProtocolExtensionContainer { {RAI-ExtIEs} } OPTIONAL,
    ...
}

RAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAListofIdleModeUEs ::= CHOICE {
    notEmptyRAListofIdleModeUEs      NotEmptyRAListofIdleModeUEs,
    emptyFullRAListofIdleModeUEs     ENUMERATED {emptylist,fulllist,...},
    ...
}

NotEmptyRAListofIdleModeUEs ::= SEQUENCE {
    rAofIdleModeUEs      RAofIdleModeUEs,
    iE-Extensions       ProtocolExtensionContainer { {NotEmptyRAListofIdleModeUEs-ExtIEs} } OPTIONAL
}

RAofIdleModeUEs ::= SEQUENCE (SIZE (1..maxMBMSRA)) OF
    RAC

NotEmptyRAListofIdleModeUEs-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-LAofIdleModeUEs      CRITICALITY reject EXTENSION LAListofIdleModeUEs PRESENCE conditional },
    -- This IE shall be present if the RA of Idle Mode UEs IE is included. --
    ...
}

LAListofIdleModeUEs ::= SEQUENCE (SIZE (1..maxMBMSRA)) OF
    LAI

RAT-Type ::= ENUMERATED {
    utran,
    geran,
    ...
}

RateControlAllowed ::= ENUMERATED {
    not-allowed,
    allowed
}

RedirectAttemptFlag ::= NULL

RedirectionCompleted ::= ENUMERATED {
    redirection-completed,
    ...
}

RejectCauseValue ::= ENUMERATED {
    pLMN-Not-Allowed,
    location-Area-Not-Allowed,

```

```
    roaming-Not-Allowed-In-This-Location-Area,
    no-Suitable-Cell-In-Location-Area,
    gPRS-Services-Not-Allowed-In-This-PLMN,
    cS-PS-coordination-required,
    ...,
    network-failure,
    not-authorized-for-this-CSG
}

RelocationRequirement ::= ENUMERATED {
    lossless,
    none,
    ...,
    realtime
}

RelocationType ::= ENUMERATED {
    ue-not-involved,
    ue-involved,
    ...
}

RepetitionNumber0 ::= INTEGER (0..255)

RepetitionNumber1 ::= INTEGER (1..256)

ReportArea ::= ENUMERATED {
    service-area,
    geographical-area,
    ...
}

ReportInterval      ::= ENUMERATED {
    ms250,
    ms500,
    ms1000,
    ms2000,
    ms3000,
    ms4000,
    ms6000,
    ms12000,
    ms16000,
    ms20000,
    ms24000,
    ms32000,
    ms64000,
    ...,
    ms8000,
    ms28000
}

ReportAmount       ::= ENUMERATED { n1, n2, n4, n8, n16, n32, n64, infinity, ... }
```

```

RequestedGPSAssistanceData ::= OCTET STRING (SIZE (1 .. 38 ))
  -- gpsAssistanceData as defined in 24.080 --

RequestedGANSSAssistanceData ::= OCTET STRING (SIZE (1 .. 201 ))
  -- ganssAssistanceData as defined in 24.080 --

RequestedLocationRelatedDataType ::= ENUMERATED {
  decipheringKeysUEBasedOTDOA,
  decipheringKeysAssistedGPS,
  dedicatedAssistanceDataUEBasedOTDOA,
  dedicatedAssistanceDataAssistedGPS,
  ...,
  -- Release 7 extension elements --
  decipheringKeysAssistedGANSS,
  dedicatedAssistanceDataAssistedGANSS,
  decipheringKeysAssistedGPSandGANSS,
  dedicatedAssistanceDataAssistedGPSandGANSS
}

RequestedMBMSIPMulticastAddressandAPNRequest ::= SEQUENCE (SIZE (1..maxnoofMulticastServicesPerRNC)) OF
  MBMSIPMulticastAddressandAPNlist

MBMSIPMulticastAddressandAPNlist ::= SEQUENCE {
  tMGI          TMGI,
  iPMulticastAddress  IPMulticastAddress,
  aPN           APN,
  iE-Extensions  ProtocolExtensionContainer { {MBMSIPMulticastAddressandAPNlist-ExtIEs} }  OPTIONAL,
  ...
}

MBMSIPMulticastAddressandAPNlist-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RequestedMulticastServiceList ::= SEQUENCE (SIZE (1.. maxnoofMulticastServicesPerUE)) OF
  TMGI

Requested-RAB-Parameter-Values ::= SEQUENCE {
  requestedMaxBitrates          Requested-RAB-Parameter-MaxBitrateList          OPTIONAL,
  requestedGuaranteedBitrates   Requested-RAB-Parameter-GuaranteedBitrateList  OPTIONAL,
  iE-Extensions                ProtocolExtensionContainer { { Requested-RAB-Parameter-Values-ExtIEs} }  OPTIONAL,
  ...
}

Requested-RAB-Parameter-Values-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  -- Extension for Release 6 to enable RNC to request the execution of an alternative RAB configuration --
  { ID id-AlternativeRABConfigurationRequest  CRITICALITY ignore  EXTENSION AlternativeRABConfigurationRequest  PRESENCE optional }|
  -- Extension for Release 7 to request an Extended Maximum Bitrate --
  { ID id-Requested-RAB-Parameter-ExtendedMaxBitrateList  CRITICALITY reject  EXTENSION Requested-RAB-Parameter-ExtendedMaxBitrateList
  PRESENCE optional }|
  -- Extension for Release 7 to request an Extended Guaranteed Bitrate --
  { ID id-Requested-RAB-Parameter-ExtendedGuaranteedBitrateList  CRITICALITY reject  EXTENSION Requested-RAB-Parameter-
  ExtendedGuaranteedBitrateList  PRESENCE optional }|
}

```

```

-- Extension for Release 8 to request an Supported Maximum Bitrate --
  { ID id-Requested-RAB-Parameter-SupportedMaxBitrateList      CRITICALITY reject  EXTENSION SupportedRAB-ParameterBitrateList  PRESENCE optional
}|
-- Extension for Release 8 to request an Supported Guaranteed Bitrate --
  { ID id-Requested-RAB-Parameter-SupportedGuaranteedBitrateList      CRITICALITY reject  EXTENSION SupportedRAB-ParameterBitrateList  PRESENCE
optional },
  ...
}

Requested-RAB-Parameter-ExtendedMaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedMaxBitrate

Requested-RAB-Parameter-ExtendedGuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF ExtendedGuaranteedBitrate

Requested-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

Requested-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

RequestType ::= SEQUENCE {
  event          Event,
  reportArea     ReportArea,
  accuracyCode   INTEGER (0..127)   OPTIONAL,
  ...
}

ResidualBitErrorRatio ::= SEQUENCE {
  mantissa       INTEGER (1..9),
  exponent       INTEGER (1..8),
  iE-Extensions  ProtocolExtensionContainer { {ResidualBitErrorRatio-ExtIEs} } OPTIONAL
}
-- ResidualBitErrorRatio = mantissa * 10^-exponent

ResidualBitErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

ResponseTime ::= ENUMERATED {
  lowdelay,
  delaytolerant,
  ...
}

RIMInformation ::= OCTET STRING

RIM-Transfer ::= SEQUENCE {
  rIMInformation      RIMInformation,
  rIMRoutingAddress   RIMRoutingAddress   OPTIONAL,
  iE-Extensions       ProtocolExtensionContainer { {RIM-Transfer-ExtIEs} } OPTIONAL
}

RIM-Transfer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

```

```

RIMRoutingAddress ::= CHOICE {
    targetRNC-ID          TargetRNC-ID,
    gERAN-Cell-ID        GERAN-Cell-ID,
    ... ,
    targeteNB-ID          TargeteNB-ID
}

RNC-ID                ::= INTEGER (0..4095)
-- RNC-ID              ::= BIT STRING (SIZE (12))
-- Harmonized with RNSAP and NBAP definitions

RNCTraceInformation ::= SEQUENCE {
    traceReference      TraceReference,
    traceActivationIndicator  ENUMERATED {activated,deactivated},
    equipmentsToBeTraced  EquipmentsToBeTraced                OPTIONAL,
    -- This IE shall be present if the Trace Activation Indicator IE is set to "Activated".
    iE-Extensions      ProtocolExtensionContainer { { RNCTraceInformation-ExtIEs } }  OPTIONAL
}

RNCTraceInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 11 to enable anonymization MDT for area based MDT --
  {ID id-TraceRecordingSessionReference  CRITICALITY ignore  EXTENSION TraceRecordingSessionReference  PRESENCE optional}|
  {ID id-IMSI                             CRITICALITY ignore  EXTENSION IMSI                             PRESENCE optional}|
  {ID id-Trace-Collection-Entity-IP-Address  CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional}|
  {ID id-Serving-Cell-Identifier            CRITICALITY ignore  EXTENSION UTRAN-CellID            PRESENCE optional},
  ...
}

RNSAPRelocationParameters ::= SEQUENCE {
    rabParametersList      RABParametersList                OPTIONAL,
    locationReporting      LocationReportingTransferInformation  OPTIONAL,
    traceInformation        TraceInformation                OPTIONAL,
    sourceSAI              SAI                              OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { RNSAPRelocationParameters-ExtIEs } }  OPTIONAL,
    ...
}

RNSAPRelocationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

RRC-Container            ::= OCTET STRING

RTLloadValue ::= INTEGER (0..100)

RSRVCC-HO-Indication ::= ENUMERATED {
    ps-only,
    ...
}

RSRVCC-Information ::= SEQUENCE {
    nonce                  BIT STRING (SIZE (128)),

```

```

    IMSInformation          OCTET STRING(SIZE(1.. maxSizeOfIMSInfo)),
    iE-Extensions          ProtocolExtensionContainer { { RSRVCC-Information-ExtIEs} } OPTIONAL,
    ...
}

RSRVCC-Information-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RSRVCC-Operation-Possible ::= ENUMERATED {
    rsrvcc-possible,
    ...
}

-- S

SAC ::= OCTET STRING (SIZE (2))
SAI ::= SEQUENCE {
    pLMNidentity          PLMNidentity,
    LAC                  LAC,
    sAC                  SAC,
    iE-Extensions        ProtocolExtensionContainer { {SAI-ExtIEs} } OPTIONAL
}

SAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SAPI ::= ENUMERATED {
    sapi-0,
    sapi-3,
    ...
}

SessionUpdateID ::= INTEGER (0.. 1048575)
Shared-Network-Information ::= SEQUENCE {
    pLMNs-in-shared-network    PLMNs-in-shared-network,
    iE-Extensions              ProtocolExtensionContainer { {Shared-Network-Information-ExtIEs} } OPTIONAL,
    ...
}

Session-Re-establishment-Indicator ::= ENUMERATED {true, ...}

Shared-Network-Information-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SignallingIndication ::= ENUMERATED {
    signalling,
    ...
}

SDU-ErrorRatio ::= SEQUENCE {

```

```

    mantissa          INTEGER (1..9),
    exponent          INTEGER (1..6),
    iE-Extensions    ProtocolExtensionContainer { {SDU-ErrorRatio-ExtIEs} } OPTIONAL
}
-- SDU-ErrorRatio = mantissa * 10^-exponent

SDU-ErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
SDU-FormatInformationParameters ::= SEQUENCE (SIZE (1..maxRAB-SubflowCombination)) OF
SEQUENCE {
    subflowSDU-Size      SubflowSDU-Size      OPTIONAL,
    rAB-SubflowCombinationBitRate RAB-SubflowCombinationBitRate OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {SDU-FormatInformationParameters-ExtIEs} } OPTIONAL,
    ...
}

SDU-FormatInformationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SDU-Parameters ::= SEQUENCE (SIZE (1..maxRAB-Subflows)) OF
SEQUENCE {
    sDU-ErrorRatio      SDU-ErrorRatio OPTIONAL
    -- This IE shall be present if the Delivery Of Erroneous SDU IE is set to "Yes" or "No" --,
    residualBitErrorRatio ResidualBitErrorRatio,
    deliveryOfErroneousSDU DeliveryOfErroneousSDU,
    sDU-FormatInformationParameters SDU-FormatInformationParameters OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {SDU-Parameters-ExtIEs} } OPTIONAL,
    ...
}

SDU-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SGSN-Group-Identity ::= CHOICE {
    null-NRI          Null-NRI,
    sGSN-Group-ID    SGSN-Group-ID
}

SGSN-Group-ID ::= OCTET STRING (SIZE (2))

SNA-Access-Information ::= SEQUENCE {
    authorisedPLMNs    AuthorisedPLMNs,
    iE-Extensions    ProtocolExtensionContainer { {SNA-Access-Information-ExtIEs} } OPTIONAL,
    ...
}

SNA-Access-Information-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SNAC                ::= INTEGER (0..65535)

```

```

Service-Handover ::= ENUMERATED {
    handover-to-GSM-should-be-performed,
    handover-to-GSM-should-not-be-performed,
    handover-to-GSM-shall-not-be-performed,
    ...
}

Source-ToTarget-TransparentContainer ::= OCTET STRING
-- This IE is a transparent container, the IE shall be encoded not as an OCTET STRING but according to the type specifications of the target
system.
-- Note: In the current version of this specification, this IE may either carry the Source RNC to
Target RNC Transparent Container or the Source eNB to Target eNB Transparent Container IE as
-- defined in TS 36.413 [49]

SourceeNodeB-ToTargeteNodeB-TransparentContainer ::= OCTET STRING

SourceCellID ::= CHOICE {
    sourceUTRANCellID      SourceUTRANCellID,
    sourceGERANCellID      CGI,
    ...
}

SourceBSS-ToTargetBSS-TransparentContainer ::= OCTET STRING

SourceID ::= CHOICE {
    sourceRNC-ID           SourceRNC-ID,
    SAI                    SAI,
    ...
}

SourceRNC-ID ::= SEQUENCE {
    pLMNidentity           PLMNidentity,
    rNC-ID                 RNC-ID,
    iE-Extensions         ProtocolExtensionContainer { {SourceRNC-ID-ExtIEs} } OPTIONAL
}

SourceRNC-ID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID          CRITICALITY reject EXTENSION ExtendedRNC-ID          PRESENCE optional },
    ...
}

SourceRNC-ToTargetRNC-TransparentContainer ::= SEQUENCE {
    rRC-Container          RRC-Container,
    numberOfIuInstances    NumberOfIuInstances,
    relocationType         RelocationType,
    chosenIntegrityProtectionAlgorithm ChosenIntegrityProtectionAlgorithm OPTIONAL,
    integrityProtectionKey IntegrityProtectionKey OPTIONAL,
    chosenEncryptionAlgorithmForSignalling ChosenEncryptionAlgorithm OPTIONAL,
    cipheringKey           EncryptionKey OPTIONAL,
    chosenEncryptionAlgorithmForCS ChosenEncryptionAlgorithm OPTIONAL,
}

```

```

    chosenEncryptionAlgorithmForPS    ChosenEncryptionAlgorithm    OPTIONAL,
    d-RNTI                            D-RNTI                  OPTIONAL
    -- This IE shall be present if the Relocation type IE is set to "UE not involved in relocation of SRNS" --,
    targetCellId                       TargetCellId            OPTIONAL
    -- This IE shall be present if the Relocation type IE is set to "UE involved in relocation of SRNS" --,
    rAB-TrCH-Mapping                  RAB-TrCH-Mapping       OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { {SourceRNC-ToTargetRNC-TransparentContainer-ExtIEs} } OPTIONAL,
    ...
}

SourceRNC-ToTargetRNC-TransparentContainer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable transfer of SRB mapping onto Iur transport channel Ids --
  {ID id-SRB-TrCH-Mapping              CRITICALITY reject  EXTENSION SRB-TrCH-Mapping          PRESENCE optional}}|
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
  {ID id-CellLoadInformationGroup      CRITICALITY ignore  EXTENSION CellLoadInformationGroup        PRESENCE optional}}|
-- Extension for Release 6 to provide Trace Recording Session Information to the Target RNC --
  {ID id-TraceRecordingSessionInformation CRITICALITY ignore  EXTENSION TraceRecordingSessionInformation PRESENCE optional}}|
-- Extension for Release 6 to indicate to the Target RNC that the UE has activated Multicast Service --
  {ID id-MBMSLinkingInformation        CRITICALITY ignore  EXTENSION MBMSLinkingInformation         PRESENCE optional}}|
  {ID id-d-RNTI-for-NoIuCSUP          CRITICALITY reject  EXTENSION D-RNTI                          PRESENCE optional}}|
  {ID id-UE-History-Information        CRITICALITY ignore  EXTENSION UE-History-Information         PRESENCE optional}}|
  {ID id-SubscriberProfileIDforRFP     CRITICALITY ignore  EXTENSION SubscriberProfileIDforRFP      PRESENCE optional}}|
-- Extension for Release 8 to transfer to the Target RNC parameters required for SRVCC operation --
  {ID id-SRVCC-Information             CRITICALITY reject  EXTENSION SRVCC-Information              PRESENCE optional}}|
  {ID id-PSRABtoBeReplaced            CRITICALITY reject  EXTENSION RAB-ID                          PRESENCE optional}}|
-- Extension for Release 9 to transfer to the Target RNC parameters required for CSFB operation --
  {ID id-CSFB-Information              CRITICALITY ignore  EXTENSION CSFB-Information                PRESENCE optional}}|
-- Extension for Release 10 to indicate to the Target RNC the need of continued IRAT measurement --
  {ID id-IRAT-Measurement-Configuration CRITICALITY ignore  EXTENSION IRAT-Measurement-Configuration PRESENCE optional}}|
-- Extension for Release 10 to indicate Management Based MDT Allowed --
  {ID id-Management-Based-MDT-Allowed CRITICALITY ignore  EXTENSION Management-Based-MDT-Allowed   PRESENCE optional}}|
-- Extension for Release 11 to indicate Management Based MDT PLMN List --
  {ID id-Management-Based-MDT-PLMN-List CRITICALITY ignore  EXTENSION MDT-PLMN-List                  PRESENCE optional}}|
-- Extension for Release 11 to indicate the last E-UTRAN PLMN Identity --
  {ID id-LastE-UTRANPLMNIdentity      CRITICALITY ignore  EXTENSION PLMNIdentity                    PRESENCE optional},
  ...
}

IRAT-Measurement-Configuration ::= SEQUENCE {
  rSRP                                INTEGER (0..97)      OPTIONAL,
  rSRQ                                INTEGER (0..34)     OPTIONAL,
  iRATmeasurementParameters          iRATmeasurementParameters,
  iE-Extensions                      ProtocolExtensionContainer { {IRAT-Measurement-Configuration-ExtIEs} } OPTIONAL}

IRAT-Measurement-Configuration-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  {ID id-RSRQ-Type                    CRITICALITY ignore  EXTENSION RSRQ-Type                        PRESENCE optional}}|
  {ID id-RSRQ-Extension                CRITICALITY ignore  EXTENSION RSRQ-Extension                  PRESENCE optional},
  ...
}

IRATmeasurementParameters ::= SEQUENCE {
  measurementDuration                INTEGER (1..100),
  eUTRANFrequencies                  EUTRANFrequencies  OPTIONAL,
  iE-Extensions                      ProtocolExtensionContainer { { IRATmeasurementParameters-ExtIEs } } OPTIONAL}

```

```

IRATmeasurementParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RSRQ-Type ::= SEQUENCE {
    allSymbols          BOOLEAN,
    wideBand            BOOLEAN
}

RSRQ-Extension ::= INTEGER (-30..46, ...)

EUTRANFrequencies ::= SEQUENCE (SIZE (1..maxNrOfEUTRAFreqs)) OF SEQUENCE {
    earfcn              INTEGER (0..65535),
    measBand            MeasBand          OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {EUTRANFrequencies-ExtIEs} } OPTIONAL
}

MeasBand ::= ENUMERATED {
    v6,
    v15,
    v25,
    v50,
    v75,
    v100
}

EUTRANFrequencies-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-EARFCN-Extended          CRITICALITY reject EXTENSION EARFCN-Extended          PRESENCE optional},
    ...
}

SubscriberProfileIDforRFP ::= INTEGER (1..256)

SourceStatisticsDescriptor ::= ENUMERATED {
    speech,
    unknown,
    ...
}

SupportedRAB-ParameterBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF SupportedBitrate

SupportedBitrate ::= INTEGER (1..1000000000, ...)
-- Unit is bits per sec

SourceUTRANCellID ::= SEQUENCE {
    plMNidentity        PLMNidentity,
    uTRANcellID         TargetCellId,
    iE-Extensions       ProtocolExtensionContainer { {SourceUTRANCellID-ExtIEs} } OPTIONAL
}

SourceUTRANCellID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

SRB-ID ::= INTEGER (1..32)

SRB-TrCH-Mapping ::= SEQUENCE ( SIZE (1..maxNrOfSRBs)) OF
  SRB-TrCH-MappingItem

SRB-TrCH-MappingItem ::= SEQUENCE {
  sRB-ID          SRB-ID,
  trCH-ID         TrCH-ID,
  iE-Extensions   ProtocolExtensionContainer { { SRB-TrCH-MappingItem-ExtIEs } } OPTIONAL,
  ...
}

SRB-TrCH-MappingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

SRVCC-HO-Indication ::= ENUMERATED {
  ps-and-cs,
  cs-only,
  ...
}

SRVCC-Information ::= SEQUENCE {
  nonce          BIT STRING (SIZE (128)),
  iE-Extensions   ProtocolExtensionContainer { { SRVCC-Information-ExtIEs } } OPTIONAL,
  ...
}

SRVCC-Information-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

SRVCC-Operation-Possible ::= ENUMERATED {
  srvcc-possible,
  ...
}

SubflowSDU-Size          ::= INTEGER (0..4095)
-- Unit is bit

-- T
TAC ::= OCTET STRING (SIZE (2))

TAI ::= SEQUENCE {
  pLMNidentity          PLMNidentity,
  TAC,
  iE-Extensions         ProtocolExtensionContainer { { TAI-ExtIEs } } OPTIONAL
}

TAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

```

```

Target-ToSource-TransparentContainer ::= OCTET STRING
-- This IE is a transparent container, the IE shall be encoded not as an OCTET STRING but according to the type specifications of the target
system.
-- Note: In the current version of this specification, this IE may either carry the Target RNC to
Source RNC Transparent Container or the Target eNB to Source eNB Transparent Container IE as
-- defined in TS 36.413 [49]

TargeteNodeB-ToSourceeNodeB-TransparentContainer ::= OCTET STRING

TargetBSS-ToSourceBSS-TransparentContainer ::= OCTET STRING

TargetCellId ::= INTEGER (0..268435455)

TargetID ::= CHOICE {
    targetRNC-ID TargetRNC-ID,
    CGI CGI,
    ...,
    targeteNB-ID TargeteNB-ID
}

TargeteNB-ID ::= SEQUENCE {
    PLMNidentity PLMNidentity,
    eNB-ID ENB-ID,
    iE-Extensions ProtocolExtensionContainer { {TargeteNB-ID-ExtIEs} } OPTIONAL,
    selectedTAI TAI,
    ...
}

TargeteNB-ID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

TargetRNC-ID ::= SEQUENCE {
    LAI LAI,
    rAC RAC OPTIONAL,
    rNC-ID RNC-ID,
    iE-Extensions ProtocolExtensionContainer { {TargetRNC-ID-ExtIEs} } OPTIONAL
}

TargetRNC-ID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID CRITICALITY reject EXTENSION ExtendedRNC-ID PRESENCE optional },
    ...
}

TargetRNC-ToSourceRNC-TransparentContainer ::= SEQUENCE {
    rRC-Container RRC-Container,
    d-RNTI D-RNTI OPTIONAL
-- May be included to allow the triggering of the Relocation Detect procedure from the Iur Interface --,
    iE-Extensions ProtocolExtensionContainer { {TargetRNC-ToSourceRNC-TransparentContainer-ExtIEs} } OPTIONAL,

```

```

}
...
}
TargetRNC-ToSourceRNC-TransparentContainer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}
TBCD-STRING ::= OCTET STRING
TemporaryUE-ID ::= CHOICE {
    tMSI TMSI,
    p-TMSI P-TMSI,
    ...
}
Time-UE-StayedInCell ::= INTEGER (0..4095)
Time-UE-StayedInCell-EnhancedGranularity ::= INTEGER (0..4095)
TimeToMBMSDataTransfer ::= OCTET STRING(SIZE(1))
TimingDifferenceULDL ::= OCTET STRING (SIZE(1))
TMGI ::= SEQUENCE {
    pLMNidentity PLMNidentity,
    serviceID OCTET STRING (SIZE (3)),
    iE-Extensions ProtocolExtensionContainer { {TMGI-ExtIEs} } OPTIONAL
}
TMGI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}
TMSI ::= OCTET STRING (SIZE (4))
TraceDepth ::= ENUMERATED {
    minimum,
    medium,
    maximum,
    ...
}
TraceInformation ::= SEQUENCE {
    traceReference TraceReference,
    ue-identity UE-ID,
    tracePropagationParameters TracePropagationParameters OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { TraceInformation-ExtIEs } } OPTIONAL,
    ...
}
TraceInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

```

```

TracePropagationParameters ::= SEQUENCE {
    traceRecordingSessionReference    TraceRecordingSessionReference,
    traceDepth                        TraceDepth,
    listOfInterfacesToTrace          ListOfInterfacesToTrace    OPTIONAL,
    iE-Extensions                    ProtocolExtensionContainer { { TracePropagationParameters-ExtIEs} } OPTIONAL,
    ...
}

TracePropagationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

TraceRecordingSessionInformation ::= SEQUENCE {
    traceReference                    TraceReference,
    traceRecordingSessionReference    TraceRecordingSessionReference,
    iE-Extensions                    ProtocolExtensionContainer { { TraceRecordingSessionInformation-ExtIEs} } OPTIONAL,
    ...
}

TraceRecordingSessionInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

TraceRecordingSessionReference ::= INTEGER (0..65535)

TraceReference ::= OCTET STRING (SIZE (2..3))

TraceType ::= OCTET STRING (SIZE (1))
-- Reference: GSM TS 12.08

TrafficClass ::= ENUMERATED {
    conversational,
    streaming,
    interactive,
    background,
    ...
}

TrafficHandlingPriority ::= INTEGER { spare (0), highest (1), lowest (14), no-priority-used (15) } (0..15)

TransferDelay ::= INTEGER (0..65535)
-- Unit is millisecond

UnsuccessfullyTransmittedDataVolume ::= INTEGER (0..4294967295)

TransportLayerAddress ::= BIT STRING (SIZE (1..160, ...))

TrCH-ID ::= SEQUENCE {
    dCH-ID        DCH-ID        OPTIONAL,
    dSCH-ID       DSCH-ID       OPTIONAL,
    uSCH-ID       USCH-ID       OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { TrCH-ID-ExtIEs} } OPTIONAL,
    ...
}

```

```

TrCH-ID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable transfer of HS-DSCH-MAC-d-Flow-ID onto Iur transport channel ID --
  {ID id-hs-DSCH-MAC-d-Flow-ID CRITICALITY ignore EXTENSION HS-DSCH-MAC-d-Flow-ID PRESENCE optional}|
-- Extension for Release 6 to enable transfer of E-DCH-MAC-d-Flow-ID onto Iur transport channel ID --
  {ID id-E-DCH-MAC-d-Flow-ID CRITICALITY ignore EXTENSION E-DCH-MAC-d-Flow-ID PRESENCE optional},
  ...
}

TrCH-ID-List ::= SEQUENCE (SIZE (1..maxRAB-Subflows)) OF
  TrCH-ID

TriggerID ::= OCTET STRING (SIZE (3..22))

TunnelInformation ::= SEQUENCE {
  transportLayerAddress TransportLayerAddress,
  uDP-Port-Number Port-Number OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {Tunnel-Information-ExtIEs} } OPTIONAL,
  ...
}

Tunnel-Information-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

TypeOfError ::= ENUMERATED {
  not-understood,
  missing,
  ...
}

-- U

UE-AggregateMaximumBitRate ::= SEQUENCE {
  uE-AggregateMaximumBitRateDownlink UE-AggregateMaximumBitRateDownlink OPTIONAL,
  uE-AggregateMaximumBitRateUplink UE-AggregateMaximumBitRateUplink OPTIONAL,
  ...
}

UE-AggregateMaximumBitRateDownlink ::= INTEGER (1..1000000000)
-- Unit is bits per sec

UE-AggregateMaximumBitRateUplink ::= INTEGER (1..1000000000)
-- Unit is bits per sec

UE-History-Information ::= OCTET STRING

UE-ID ::= CHOICE {
  imsi IMSI,
  imei IMEI,
  ...
}

```

```

    imeisv                IMEISV
}

UE-IsNotServed ::= SEQUENCE {
    permanentNAS-UE-ID    PermanentNAS-UE-ID,
    iE-Extensions         ProtocolExtensionContainer { { UE-IsNotServed-ExtIEs } }    OPTIONAL,
    ...
}

UE-IsNotServed-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

UE-IsServed ::= SEQUENCE {
    permanentNAS-UE-ID    PermanentNAS-UE-ID,
    pLMNidentity          PLMNidentity,
    iE-Extensions         ProtocolExtensionContainer { { UE-IsServed-ExtIEs } }    OPTIONAL,
    ...
}

UE-IsServed-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

UERegistrationQueryResult ::= CHOICE {
    uE-IsServed           UE-IsServed,
    uE-IsNotServed        UE-IsNotServed
}

UESBI-Iu ::= SEQUENCE {
    uESBI-IuA            UESBI-IuA    OPTIONAL,
    uESBI-IuB            UESBI-IuB    OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {UESBI-Iu-ExtIEs} } OPTIONAL,
    ...
}

UESBI-Iu-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

UESBI-IuA                ::= BIT STRING (SIZE(1..128))
-- Reference: TR25.994 --
UESBI-IuB                ::= BIT STRING (SIZE(1..128))
-- Reference: TR25.995 --

UL-GTP-PDU-SequenceNumber ::= INTEGER (0..65535)

UL-N-PDU-SequenceNumber   ::= INTEGER (0..65535)

UPInformation ::= SEQUENCE {
    frameSeqNoUL          FrameSequenceNumber,
    frameSeqNoDL          FrameSequenceNumber,
}

```

```

    pdu14FrameSeqNoUL      PDUType14FrameSequenceNumber,
    pdu14FrameSeqNoDL      PDUType14FrameSequenceNumber,
    dataPDUType            DataPDUType,
    upinitialisationFrame  UPInitialisationFrame,
    iE-Extensions          ProtocolExtensionContainer { { UPInformation-ExtIEs } }    OPTIONAL,
    ...
}

UPInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    {ID id-TimingDifferenceULDL      CRITICALITY ignore EXTENSION TimingDifferenceULDL      PRESENCE optional},
    ...
}

UPInitialisationFrame ::= OCTET STRING

UP-ModeVersions        ::= BIT STRING (SIZE (16))

USCH-ID                ::= INTEGER (0..255)

UserPlaneMode ::= ENUMERATED {
    transparent-mode,
    support-mode-for-predefined-SDU-sizes,
    ...
}

UTRAN-CellID ::= SEQUENCE {
    pLMNidentity          PLMNidentity,
    cellID                TargetCellId,
    iE-Extensions          ProtocolExtensionContainer { { UTRAN-CellID-ExtIEs } } OPTIONAL
}

UTRAN-CellID-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- V

VelocityEstimate ::= CHOICE {
    horizontalVelocity          HorizontalVelocity,
    horizontalWithVerticalVelocity      HorizontalWithVerticalVelocity,
    horizontalVelocityWithUncertainty    HorizontalVelocityWithUncertainty,
    horizontalWithVeritcalVelocityAndUncertainty    HorizontalWithVerticalVelocityAndUncertainty,
    ...
}

HorizontalVelocity ::= SEQUENCE {
    horizontalSpeedAndBearing          HorizontalSpeedAndBearing,
    iE-Extensions          ProtocolExtensionContainer { { HorizontalVelocity-ExtIEs } } OPTIONAL,
    ...
}

HorizontalVelocity-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {

```

```

}
...
}

HorizontalWithVerticalVelocity ::= SEQUENCE {
    horizontalSpeedAndBearing          HorizontalSpeedAndBearing,
    verticalVelocity                    VerticalVelocity,
    iE-Extensions                      ProtocolExtensionContainer { { HorizontalWithVerticalVelocity-ExtIEs } } OPTIONAL,
    ...
}

HorizontalWithVerticalVelocity-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

HorizontalVelocityWithUncertainty ::= SEQUENCE {
    horizontalSpeedAndBearing          HorizontalSpeedAndBearing,
    uncertaintySpeed                   INTEGER (0..255),
    iE-Extensions                      ProtocolExtensionContainer { { HorizontalVelocityWithUncertainty-ExtIEs } } OPTIONAL,
    ...
}

HorizontalVelocityWithUncertainty-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

HorizontalWithVerticalVelocityAndUncertainty ::= SEQUENCE {
    horizontalSpeedAndBearing          HorizontalSpeedAndBearing,
    verticalVelocity                    VerticalVelocity,
    horizontalUncertaintySpeed         INTEGER (0..255),
    verticalUncertaintySpeed           INTEGER (0..255),
    iE-Extensions                      ProtocolExtensionContainer { { HorizontalWithVerticalVelocityAndUncertainty-ExtIEs } } OPTIONAL,
    ...
}

HorizontalWithVerticalVelocityAndUncertainty-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

HorizontalSpeedAndBearing ::= SEQUENCE {
    bearing                            INTEGER (0..359),
    horizontalSpeed                     INTEGER (0..2047)
}

VerticalVelocity ::= SEQUENCE {
    verticalSpeed                       INTEGER (0..255),
    verticalSpeedDirection              VerticalSpeedDirection
}

VerticalSpeedDirection ::= ENUMERATED {
    upward,
    downward
}

```

```
VerticalAccuracyCode ::= INTEGER (0..127)
```

```
VoiceSupportMatchIndicator ::= ENUMERATED {
  supported,
  not-supported,
  ...
}
```

```
END
```

9.3.5 Common Definitions

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

```
RANAP-CommonDataTypes {
  itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
  umts-Access (20) modules (3) ranap (0) version1 (1) ranap-CommonDataTypes (3) }
```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

```
Criticality ::= ENUMERATED { reject, ignore, notify }
```

```
Presence ::= ENUMERATED { optional, conditional, mandatory }
```

```
PrivateIE-ID ::= CHOICE {
  local INTEGER (0..65535),
  global OBJECT IDENTIFIER
}
```

```
ProcedureCode ::= INTEGER (0..255)
```

```
ProtocolExtensionID ::= INTEGER (0..65535)
```

```
ProtocolIE-ID ::= INTEGER (0..65535)
```

```
TriggeringMessage ::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome, outcome }
```

```
END
```

9.3.6 Constant Definitions

```
-- *****
--
-- Constant definitions
--
```

```
-- *****
RANAP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- Elementary Procedures
--
-- *****

id-RAB-Assignment                INTEGER ::= 0
id-Iu-Release                    INTEGER ::= 1
id-RelocationPreparation         INTEGER ::= 2
id-RelocationResourceAllocation  INTEGER ::= 3
id-RelocationCancel              INTEGER ::= 4
id-SRNS-ContextTransfer         INTEGER ::= 5
id-SecurityModeControl          INTEGER ::= 6
id-DataVolumeReport             INTEGER ::= 7
id-Reset                         INTEGER ::= 9
id-RAB-ReleaseRequest           INTEGER ::= 10
id-Iu-ReleaseRequest            INTEGER ::= 11
id-RelocationDetect             INTEGER ::= 12
id-RelocationComplete           INTEGER ::= 13
id-Paging                       INTEGER ::= 14
id-CommonID                     INTEGER ::= 15
id-CN-InvokeTrace               INTEGER ::= 16
id-LocationReportingControl     INTEGER ::= 17
id-LocationReport               INTEGER ::= 18
id-InitialUE-Message           INTEGER ::= 19
id-DirectTransfer               INTEGER ::= 20
id-OverloadControl              INTEGER ::= 21
id-ErrorIndication              INTEGER ::= 22
id-SRNS-DataForward             INTEGER ::= 23
id-ForwardSRNS-Context         INTEGER ::= 24
id-privateMessage               INTEGER ::= 25
id-CN-DeactivateTrace          INTEGER ::= 26
id-ResetResource                INTEGER ::= 27
id-RANAP-Relocation             INTEGER ::= 28
id-RAB-ModifyRequest            INTEGER ::= 29
id-LocationRelatedData         INTEGER ::= 30
id-InformationTransfer          INTEGER ::= 31
id-UESpecificInformation        INTEGER ::= 32
id-UplinkInformationExchange    INTEGER ::= 33
id-DirectInformationTransfer     INTEGER ::= 34
id-MBMSSessionStart            INTEGER ::= 35
id-MBMSSessionUpdate           INTEGER ::= 36
id-MBMSSessionStop             INTEGER ::= 37
id-MBMSUELinking                INTEGER ::= 38
```

```

id-MBMSRegistration                INTEGER ::= 39
id-MBMSNCDe-Registration-Procedure  INTEGER ::= 40
id-MBMSRABEstablishmentIndication   INTEGER ::= 41
id-MBMSRABRelease                   INTEGER ::= 42
id-enhancedRelocationComplete       INTEGER ::= 43
id-enhancedRelocationCompleteConfirm INTEGER ::= 44
id-RANAPenhancedRelocation          INTEGER ::= 45
id-SRVCCPreparation                 INTEGER ::= 46
id-UeRadioCapabilityMatch           INTEGER ::= 47
id-UeRegistrationQuery              INTEGER ::= 48
id-RerouteNASRequest                INTEGER ::= 49

-- *****
--
-- Extension constants
--
-- *****

maxPrivateIEs                      INTEGER ::= 65535
maxProtocolExtensions               INTEGER ::= 65535
maxProtocolIEs                     INTEGER ::= 65535

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

maxNrOfDTs                          INTEGER ::= 15
maxNrOfErrors                        INTEGER ::= 256
maxNrOfIuSigConIds                  INTEGER ::= 250
maxNrOfPDPDirections                INTEGER ::= 2
maxNrOfPoints                       INTEGER ::= 15
maxNrOfRABs                         INTEGER ::= 256
maxNrOfSeparateTrafficDirections     INTEGER ::= 2
maxNrOfSRBs                         INTEGER ::= 8
maxNrOfVol                          INTEGER ::= 2
maxNrOfLevels                       INTEGER ::= 256
maxNrOfAltValues                    INTEGER ::= 16
maxNrOfPLMNsSN                      INTEGER ::= 32
maxNrOfLAs                          INTEGER ::= 65536
maxNrOfSNAs                         INTEGER ::= 65536
maxNrOfUEsToBeTraced                INTEGER ::= 64
maxNrOfInterfaces                   INTEGER ::= 16
maxRAB-Subflows                     INTEGER ::= 7
maxRAB-SubflowCombination            INTEGER ::= 64
maxSet                               INTEGER ::= 9
maxNrOfHSDSCHMACdFlows-1            INTEGER ::= 7
maxnoofMulticastServicesPerUE       INTEGER ::= 128
maxnoofMulticastServicesPerRNC      INTEGER ::= 512
maxMBMSSA                           INTEGER ::= 256
maxMBMSRA                           INTEGER ::= 65536
maxNrOfEDCHMACdFlows-1              INTEGER ::= 7
maxGANSSSet                         INTEGER ::= 9

```

```

maxNrOfCSGs                INTEGER ::= 256
maxNrOfEUTRAFreqs          INTEGER ::= 8
maxNrOfCellIds              INTEGER ::= 32
maxNrOfRAIs                 INTEGER ::= 8
maxNrOfLAIs                 INTEGER ::= 8
maxSizeOfIMSInfo           INTEGER ::= 32
maxnoofMDTPLMNs            INTEGER ::= 16
maxAddPosSet                INTEGER ::= 8

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

id-AreaIdentity              INTEGER ::= 0
id-CN-DomainIndicator        INTEGER ::= 3
id-Cause                     INTEGER ::= 4
id-ChosenEncryptionAlgorithm INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2     INTEGER ::= 7
id-ClassmarkInformation3     INTEGER ::= 8
id-CriticalityDiagnostics    INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber INTEGER ::= 10
id-EncryptionInformation     INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation    INTEGER ::= 13
id-L3-Information            INTEGER ::= 14
id-LAI                       INTEGER ::= 15
id-NAS-PDU                   INTEGER ::= 16
id-NonSearchingIndication    INTEGER ::= 17
id-NumberOfSteps             INTEGER ::= 18
id-OMC-ID                    INTEGER ::= 19
id-OldBSS-ToNewBSS-Information INTEGER ::= 20
id-PagingAreaID              INTEGER ::= 21
id-PagingCause               INTEGER ::= 22
id-PermanentNAS-UE-ID       INTEGER ::= 23
id-RAB-ContextItem           INTEGER ::= 24
id-RAB-ContextList           INTEGER ::= 25
id-RAB-DataForwardingItem    INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList    INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem  INTEGER ::= 30
id-RAB-DataVolumeReportList  INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem            INTEGER ::= 34
id-RAB-FailedList            INTEGER ::= 35
id-RAB-ID                    INTEGER ::= 36
id-RAB-QueuedItem            INTEGER ::= 37
id-RAB-QueuedList            INTEGER ::= 38
id-RAB-ReleaseFailedList     INTEGER ::= 39
id-RAB-ReleaseItem           INTEGER ::= 40

```

id-RAB-ReleaseList	INTEGER ::= 41
id-RAB-ReleasedItem	INTEGER ::= 42
id-RAB-ReleasedList	INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp	INTEGER ::= 44
id-RAB-RelocationReleaseItem	INTEGER ::= 45
id-RAB-RelocationReleaseList	INTEGER ::= 46
id-RAB-SetupItem-RelocReq	INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck	INTEGER ::= 48
id-RAB-SetupList-RelocReq	INTEGER ::= 49
id-RAB-SetupList-RelocReqAck	INTEGER ::= 50
id-RAB-SetupOrModifiedItem	INTEGER ::= 51
id-RAB-SetupOrModifiedList	INTEGER ::= 52
id-RAB-SetupOrModifyItem	INTEGER ::= 53
id-RAB-SetupOrModifyList	INTEGER ::= 54
id-RAC	INTEGER ::= 55
id-RelocationType	INTEGER ::= 56
id-RequestType	INTEGER ::= 57
id-SAI	INTEGER ::= 58
id-SAPI	INTEGER ::= 59
id-SourceID	INTEGER ::= 60
id-Source-ToTarget-TransparentContainer	INTEGER ::= 61
id-TargetID	INTEGER ::= 62
id-Target-ToSource-TransparentContainer	INTEGER ::= 63
id-TemporaryUE-ID	INTEGER ::= 64
id-TraceReference	INTEGER ::= 65
id-TraceType	INTEGER ::= 66
id-TransportLayerAddress	INTEGER ::= 67
id-TriggerID	INTEGER ::= 68
id-UE-ID	INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber	INTEGER ::= 70
id-RAB-FailedtoReportItem	INTEGER ::= 71
id-RAB-FailedtoReportList	INTEGER ::= 72
id-KeyStatus	INTEGER ::= 75
id-DRX-CycleLengthCoefficient	INTEGER ::= 76
id-IuSigConIdList	INTEGER ::= 77
id-IuSigConIdItem	INTEGER ::= 78
id-IuSigConId	INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf	INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf	INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf	INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf	INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem	INTEGER ::= 84
id-RAB-ContextFailedtoTransferList	INTEGER ::= 85
id-GlobalRNC-ID	INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp	INTEGER ::= 87
id-MessageStructure	INTEGER ::= 88
id-Alt-RAB-Parameters	INTEGER ::= 89
id-Ass-RAB-Parameters	INTEGER ::= 90
id-RAB-ModifyList	INTEGER ::= 91
id-RAB-ModifyItem	INTEGER ::= 92
id-TypeOfError	INTEGER ::= 93
id-BroadcastAssistanceDataDecipheringKeys	INTEGER ::= 94
id-LocationRelatedDataRequestType	INTEGER ::= 95
id-GlobalCN-ID	INTEGER ::= 96

id-LastKnownServiceArea	INTEGER ::= 97
id-SRB-TrCH-Mapping	INTEGER ::= 98
id-InterSystemInformation-TransparentContainer	INTEGER ::= 99
id-NewBSS-To-OldBSS-Information	INTEGER ::= 100
id-SourceRNC-PDCP-context-info	INTEGER ::= 103
id-InformationTransferID	INTEGER ::= 104
id-SNA-Access-Information	INTEGER ::= 105
id-ProvidedData	INTEGER ::= 106
id-GERAN-BSC-Container	INTEGER ::= 107
id-GERAN-Classmark	INTEGER ::= 108
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item	INTEGER ::= 109
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse	INTEGER ::= 110
id-VerticalAccuracyCode	INTEGER ::= 111
id-ResponseTime	INTEGER ::= 112
id-PositioningPriority	INTEGER ::= 113
id-ClientType	INTEGER ::= 114
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode	INTEGER ::= 115
id-SignallingIndication	INTEGER ::= 116
id-hS-DSCH-MAC-d-Flow-ID	INTEGER ::= 117
id-UESBI-Iu	INTEGER ::= 118
id-PositionData	INTEGER ::= 119
id-PositionDataSpecificToGERANIuMode	INTEGER ::= 120
id-CellLoadInformationGroup	INTEGER ::= 121
id-AccuracyFulfilmentIndicator	INTEGER ::= 122
id-InformationTransferType	INTEGER ::= 123
id-TraceRecordingSessionInformation	INTEGER ::= 124
id-TracePropagationParameters	INTEGER ::= 125
id-InterSystemInformationTransferType	INTEGER ::= 126
id-SelectedPLMN-ID	INTEGER ::= 127
id-RedirectionCompleted	INTEGER ::= 128
id-RedirectionIndication	INTEGER ::= 129
id-NAS-SequenceNumber	INTEGER ::= 130
id-RejectCauseValue	INTEGER ::= 131
id-APN	INTEGER ::= 132
id-CNMBMSLinkingInformation	INTEGER ::= 133
id-DeltaRAListofIdleModeUEs	INTEGER ::= 134
id-FrequenceLayerConvergenceFlag	INTEGER ::= 135
id-InformationExchangeID	INTEGER ::= 136
id-InformationExchangeType	INTEGER ::= 137
id-InformationRequested	INTEGER ::= 138
id-InformationRequestType	INTEGER ::= 139
id-IPMulticastAddress	INTEGER ::= 140
id-JoinedMBMSBearerServicesList	INTEGER ::= 141
id-LeftMBMSBearerServicesList	INTEGER ::= 142
id-MBMSBearerServiceType	INTEGER ::= 143
id-MBMSCNDe-Registration	INTEGER ::= 144
id-MBMSServiceArea	INTEGER ::= 145
id-MBMSSessionDuration	INTEGER ::= 146
id-MBMSSessionIdentity	INTEGER ::= 147
id-PDP-TypeInformation	INTEGER ::= 148
id-RAB-Parameters	INTEGER ::= 149
id-RAListofIdleModeUEs	INTEGER ::= 150
id-MBMSRegistrationRequestType	INTEGER ::= 151
id-SessionUpdateID	INTEGER ::= 152

id-TMGI	INTEGER ::= 153
id-TransportLayerInformation	INTEGER ::= 154
id-UnsuccessfulLinkingList	INTEGER ::= 155
id-MBMSLinkingInformation	INTEGER ::= 156
id-MBMSSessionRepetitionNumber	INTEGER ::= 157
id-AlternativeRABConfiguration	INTEGER ::= 158
id-AlternativeRABConfigurationRequest	INTEGER ::= 159
id-E-DCH-MAC-d-Flow-ID	INTEGER ::= 160
id-SourceBSS-ToTargetBSS-TransparentContainer	INTEGER ::= 161
id-TargetBSS-ToSourceBSS-TransparentContainer	INTEGER ::= 162
id-TimeToMBMSDataTransfer	INTEGER ::= 163
id-IncludeVelocity	INTEGER ::= 164
id-VelocityEstimate	INTEGER ::= 165
id-RedirectAttemptFlag	INTEGER ::= 166
id-RAT-Type	INTEGER ::= 167
id-PeriodicLocationInfo	INTEGER ::= 168
id-MBMSCountingInformation	INTEGER ::= 169
id-170-not-to-be-used-for-IE-ids	INTEGER ::= 170
id-ExtendedRNC-ID	INTEGER ::= 171
id-Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf	INTEGER ::= 172
id-Alt-RAB-Parameter-ExtendedMaxBitrateInf	INTEGER ::= 173
id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList	INTEGER ::= 174
id-Ass-RAB-Parameter-ExtendedMaxBitrateList	INTEGER ::= 175
id-RAB-Parameter-ExtendedGuaranteedBitrateList	INTEGER ::= 176
id-RAB-Parameter-ExtendedMaxBitrateList	INTEGER ::= 177
id-Requested-RAB-Parameter-ExtendedMaxBitrateList	INTEGER ::= 178
id-Requested-RAB-Parameter-ExtendedGuaranteedBitrateList	INTEGER ::= 179
id-LAofIdleModeUEs	INTEGER ::= 180
id-newLAListofIdleModeUEs	INTEGER ::= 181
id-LAListwithNoIdleModeUEsAnyMore	INTEGER ::= 182
id-183-not-to-be-used-for-IE-ids	INTEGER ::= 183
id-GANSS-PositioningDataSet	INTEGER ::= 184
id-RequestedGANSSAssistanceData	INTEGER ::= 185
id-BroadcastGANSSAssistanceDataDecipheringKeys	INTEGER ::= 186
id-d-RNTI-for-NoIuCSUP	INTEGER ::= 187
id-RAB-SetupList-EnhancedRelocCompleteReq	INTEGER ::= 188
id-RAB-SetupItem-EnhancedRelocCompleteReq	INTEGER ::= 189
id-RAB-SetupList-EnhancedRelocCompleteRes	INTEGER ::= 190
id-RAB-SetupItem-EnhancedRelocCompleteRes	INTEGER ::= 191
id-RAB-SetupList-EnhRelocInfoReq	INTEGER ::= 192
id-RAB-SetupItem-EnhRelocInfoReq	INTEGER ::= 193
id-RAB-SetupList-EnhRelocInfoRes	INTEGER ::= 194
id-RAB-SetupItem-EnhRelocInfoRes	INTEGER ::= 195
id-OldIuSigConId	INTEGER ::= 196
id-RAB-FailedList-EnhRelocInfoRes	INTEGER ::= 197
id-RAB-FailedItem-EnhRelocInfoRes	INTEGER ::= 198
id-Global-ENB-ID	INTEGER ::= 199
id-UE-History-Information	INTEGER ::= 200
id-MBMSynchronisationInformation	INTEGER ::= 201
id-SubscriberProfileIDforRFP	INTEGER ::= 202
id-CSG-Id	INTEGER ::= 203
id-OldIuSigConIdCS	INTEGER ::= 204
id-OldIuSigConIdPS	INTEGER ::= 205
id-GlobalCN-IDCS	INTEGER ::= 206

id-GlobalCN-IDPS	INTEGER ::= 207
id-SourceExtendedRNC-ID	INTEGER ::= 208
id-RAB-ToBeReleasedItem-EnhancedRelocCompleteRes	INTEGER ::= 209
id-RAB-ToBeReleasedList-EnhancedRelocCompleteRes	INTEGER ::= 210
id-SourceRNC-ID	INTEGER ::= 211
id-Relocation-TargetRNC-ID	INTEGER ::= 212
id-Relocation-TargetExtendedRNC-ID	INTEGER ::= 213
id-Alt-RAB-Parameter-SupportedGuaranteedBitrateInf	INTEGER ::= 214
id-Alt-RAB-Parameter-SupportedMaxBitrateInf	INTEGER ::= 215
id-Ass-RAB-Parameter-SupportedGuaranteedBitrateList	INTEGER ::= 216
id-Ass-RAB-Parameter-SupportedMaxBitrateList	INTEGER ::= 217
id-RAB-Parameter-SupportedGuaranteedBitrateList	INTEGER ::= 218
id-RAB-Parameter-SupportedMaxBitrateList	INTEGER ::= 219
id-Requested-RAB-Parameter-SupportedMaxBitrateList	INTEGER ::= 220
id-Requested-RAB-Parameter-SupportedGuaranteedBitrateList	INTEGER ::= 221
id-Relocation-SourceRNC-ID	INTEGER ::= 222
id-Relocation-SourceExtendedRNC-ID	INTEGER ::= 223
id-EncryptionKey	INTEGER ::= 224
id-IntegrityProtectionKey	INTEGER ::= 225
id-SRVCC-HO-Indication	INTEGER ::= 226
id-SRVCC-Information	INTEGER ::= 227
id-SRVCC-Operation-Possible	INTEGER ::= 228
id-CSG-Id-List	INTEGER ::= 229
id-PSRABtoBeReplaced	INTEGER ::= 230
id-E-UTRAN-Service-Handover	INTEGER ::= 231
id-UE-AggregateMaximumBitRate	INTEGER ::= 233
id-CSG-Membership-Status	INTEGER ::= 234
id-Cell-Access-Mode	INTEGER ::= 235
id-IP-Source-Address	INTEGER ::= 236
id-CSFB-Information	INTEGER ::= 237
id-PDP-TypeInformation-extension	INTEGER ::= 238
id-MSISDN	INTEGER ::= 239
id-Offload-RAB-Parameters	INTEGER ::= 240
id-LGW-TransportLayerAddress	INTEGER ::= 241
id-Correlation-ID	INTEGER ::= 242
id-IRAT-Measurement-Configuration	INTEGER ::= 243
id-MDT-Configuration	INTEGER ::= 244
id-Priority-Class-Indicator	INTEGER ::= 245
id-RNSAPRelocationParameters	INTEGER ::= 247
id-RABParametersList	INTEGER ::= 248
id-Management-Based-MDT-Allowed	INTEGER ::= 249
id-HigherBitratesThan16MbpsFlag	INTEGER ::= 250
id-Trace-Collection-Entity-IP-Address	INTEGER ::= 251
id-End-Of-CSFB	INTEGER ::= 252
id-Time-UE-StayedInCell-EnhancedGranularity	INTEGER ::= 253
id-Out-Of-UTRAN	INTEGER ::= 254
id-TraceRecordingSessionReference	INTEGER ::= 255
id-IMSI	INTEGER ::= 256
id-HO-Cause	INTEGER ::= 257
id-VoiceSupportMatchIndicator	INTEGER ::= 258
id-RSRVCC-HO-Indication	INTEGER ::= 259
id-RSRVCC-Information	INTEGER ::= 260
id-AnchorPLMN-ID	INTEGER ::= 261
id-Tunnel-Information-for-BBF	INTEGER ::= 262

```

id-Management-Based-MDT-PLMN-List      INTEGER ::= 263
id-SignallingBasedMDTPLMNList          INTEGER ::= 264
id-M4Report                             INTEGER ::= 265
id-M5Report                             INTEGER ::= 266
id-M6Report                             INTEGER ::= 267
id-M7Report                             INTEGER ::= 268
id-TimingDifferenceULDL                 INTEGER ::= 269
id-Serving-Cell-Identifier              INTEGER ::= 270
id-EARFCN-Extended                      INTEGER ::= 271
id-RSRVCC-Operation-Possible            INTEGER ::= 272
id-SIPTO-LGW-TransportLayerAddress      INTEGER ::= 273
id-SIPTO-Correlation-ID                 INTEGER ::= 274
id-LHN-ID                               INTEGER ::= 275
id-Session-Re-establishment-Indicator   INTEGER ::= 276
id-LastE-UTRANPLMNIdentity             INTEGER ::= 277
id-RSRQ-Type                            INTEGER ::= 278
id-RSRQ-Extension                       INTEGER ::= 279
id-Additional-CSPS-coordination-information INTEGER ::= 280
id-UERegistrationQueryResult           INTEGER ::= 281
id-IuSigConIdRangeEnd                  INTEGER ::= 282
id-BarometricPressure                  INTEGER ::= 283
id-Additional-PositioningDataSet        INTEGER ::= 284
id-CivicAddress                         INTEGER ::= 285
id-SGSN-Group-Identity                 INTEGER ::= 286
id-P-TMSI                               INTEGER ::= 287
id-RANAP-Message                       INTEGER ::= 288
id-PowerSavingIndicator                 INTEGER ::= 289

```

END

9.3.7 Container Definitions

```

-- *****
--
-- Container definitions
--
-- *****

RANAP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS

```

```

    Criticality,
    Presence,
    PrivateIE-ID,
    ProtocolExtensionID,
    ProtocolIE-ID
FROM RANAP-CommonDataTypes

    maxPrivateIEs,
    maxProtocolExtensions,
    maxProtocolIEs
FROM RANAP-Constants;

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

RANAP-PROTOCOL-IES ::= CLASS {
    &id          ProtocolIE-ID          UNIQUE,
    &criticality Criticality,
    &Value,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    CRITICALITY &criticality
    TYPE        &Value
    PRESENCE    &presence
}

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

RANAP-PROTOCOL-IES-PAIR ::= CLASS {
    &id          ProtocolIE-ID          UNIQUE,
    &firstCriticality Criticality,
    &FirstValue,
    &secondCriticality Criticality,
    &SecondValue,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    FIRST CRITICALITY &firstCriticality
    FIRST TYPE      &FirstValue
    SECOND CRITICALITY &secondCriticality
    SECOND TYPE     &SecondValue
    PRESENCE       &presence
}

```

```

-- *****
--
-- Class Definition for Protocol Extensions
--
-- *****

RANAP-PROTOCOL-EXTENSION ::= CLASS {
    &id          ProtocolExtensionID          UNIQUE,
    &criticality Criticality,
    &Extension,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    CRITICALITY &criticality
    EXTENSION   &Extension
    PRESENCE    &presence
}

-- *****
--
-- Class Definition for Private IEs
--
-- *****

RANAP-PRIVATE-IES ::= CLASS {
    &id          PrivateIE-ID,
    &criticality Criticality,
    &Value,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    CRITICALITY &criticality
    TYPE        &Value
    PRESENCE    &presence
}

-- *****
--
-- Container for Protocol IEs
--
-- *****

ProtocolIE-Container {RANAP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-Field {RANAP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id          RANAP-PROTOCOL-IES.&id          ({IEsSetParam}),
    criticality RANAP-PROTOCOL-IES.&criticality  ({IEsSetParam}{@id}),
    value       RANAP-PROTOCOL-IES.&Value       ({IEsSetParam}{@id})
}

```

```

-- *****
--
-- Container for Protocol IE Pairs
--
-- *****

ProtocolIE-ContainerPair {RANAP-PROTOCOL-IES-PAIR : IEsSetParam} ::=
  SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-FieldPair {{IEsSetParam}}

ProtocolIE-FieldPair {RANAP-PROTOCOL-IES-PAIR : IEsSetParam} ::= SEQUENCE {
  id                RANAP-PROTOCOL-IES-PAIR.&id                ({IEsSetParam}),
  firstCriticality  RANAP-PROTOCOL-IES-PAIR.&firstCriticality  ({IEsSetParam}@id),
  firstValue        RANAP-PROTOCOL-IES-PAIR.&FirstValue        ({IEsSetParam}@id),
  secondCriticality RANAP-PROTOCOL-IES-PAIR.&secondCriticality  ({IEsSetParam}@id),
  secondValue       RANAP-PROTOCOL-IES-PAIR.&SecondValue       ({IEsSetParam}@id)
}

-- *****
--
-- Container Lists for Protocol IE Containers
--
-- *****

ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, RANAP-PROTOCOL-IES : IEsSetParam} ::=
  SEQUENCE (SIZE (lowerBound..upperBound)) OF
    ProtocolIE-Container {{IEsSetParam}}

ProtocolIE-ContainerPairList {INTEGER : lowerBound, INTEGER : upperBound, RANAP-PROTOCOL-IES-PAIR : IEsSetParam} ::=
  SEQUENCE (SIZE (lowerBound..upperBound)) OF
    ProtocolIE-ContainerPair {{IEsSetParam}}

-- *****
--
-- Container for Protocol Extensions
--
-- *****

ProtocolExtensionContainer {RANAP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
  SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField {RANAP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
  id                RANAP-PROTOCOL-EXTENSION.&id                ({ExtensionSetParam}),
  criticality        RANAP-PROTOCOL-EXTENSION.&criticality        ({ExtensionSetParam}@id),
  extensionValue     RANAP-PROTOCOL-EXTENSION.&Extension         ({ExtensionSetParam}@id)
}

-- *****
--
-- Container for Private IEs
--
-- *****

```

```
PrivateIE-Container {RANAP-PRIVATE-IES : IEsSetParam } ::=
  SEQUENCE (SIZE (1.. maxPrivateIEs)) OF
    PrivateIE-Field {{IEsSetParam}}

PrivateIE-Field {RANAP-PRIVATE-IES : IEsSetParam} ::= SEQUENCE {
  id          RANAP-PRIVATE-IES.&id          ({IEsSetParam}),
  criticality RANAP-PRIVATE-IES.&criticality  ({IEsSetParam}@id),
  value       RANAP-PRIVATE-IES.&Value       ({IEsSetParam}@id)
}

END
```

9.4 Message Transfer Syntax

RANAP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax as specified in ITU-T Rec. X.691 [13].

9.5 Timers

$T_{\text{RELOCprep}}$

- Specifies the maximum time for Relocation Preparation procedure in the source RNC.

$T_{\text{RELOCoverall}}$

- Specifies the maximum time for the protection of overall Relocation procedure in the source RNC.

$T_{\text{RELOCalloc}}$

- Specifies the maximum time for Relocation Resource Allocation procedure in the CN.

$T_{\text{RELOCcomplete}}$

- Specifies the maximum time for waiting the relocation completion in the CN.

T_{RABAssgt}

- Specifies the maximum time in the CN for the whole RAB Assignment procedure.

T_{QUEUING}

- Specifies the maximum time in the RNC for queuing of the request of RAB establishment or modification.

T_{DATAfwd}

- Specifies the maximum time for GTP-PDU forwarding at the source RNC during relocation of SRNS.

T_{igOC}

- While this timer is running, all OVERLOAD messages or signalling point congested information received at the CN are ignored.

T_{igOR}

- While this timer is running, all OVERLOAD messages or signalling point congested information received at the RNC are ignored.

T_{inTC}

- While this timer is running, the CN is not allowed to increase traffic.

T_{inTR}

- While this timer is running, the RNC is not allowed to increase traffic.

T_{RafC}

- Specifies the maximum time for Reset procedure in the RNC.

T_{RatC}

- Specifies a guard period in the RNC before sending a RESET ACKNOWLEDGE message.

T_{RafR}

- Specifies the maximum time for Reset procedure in the CN.

T_{RatR}

The source RNC shall also include within the RANAP ENHANCED RELOCATION INFORMATION REQUEST message the *CSG Id* IE, if available. If the *CSG Id* IE is included, the *CSG Membership Status* IE shall be included as well.


```
ExampleMessage-Extensions RANAP-PROTOCOL-EXTENSION ::= {  
    ...  
}
```

Annex B (informative): RANAP Transparent containers content

Transparent containers are used in order to transfer information from one RAN node to another RAN node. Depending on the particular scenario the behaviour of both involved RAN nodes may be either specified according to the same radio system or according to different radio systems. During an inter-system handover the source RAN node has to adapt to the target RAN node and its requirements.

In RANAP, for intra-system relocation and inter-system handover to and from E-UTRAN, there is a single transparent container defined for transporting information from the source to the target RAN node and a single transparent container for transporting information from the target to the source RAN node during relocation/handover preparation: the *Source to Target Transparent Container* IE and the *Target to Source Transparent Container* IE, which may carry either UTRAN or E-UTRAN specific information.

Note: The definition of generic transparent containers for relocation/handover purposes allows to transport them through the core network in a RAT-agnostic way. Inter-system handover to GERAN is not affected by this scheme.

Therefore the container content is encoded according to the rules which are specified for in the target radio system. In subclause 8.6.2, it is described how the transparent container shall be encoded with respect to the scenario in which it is used.

The table below is showing all possible scenarios and definitions according to which the content of the transparent container shall be encoded. Additionally the reference to the specification defining particular IE is given.

Table B.1: Specification of Transparent Containers referenced in RANAP.

Scenario	<i>Source to Target Transparent Container</i> IE in RANAP: RELOCATION REQUIRED message		<i>Target to Source Transparent Container</i> IE in RANAP: RELOCATION COMMAND message	
	Name of the IE	Definition in specification	Name of the IE	Definition in specification
Intra UTRAN relocation	Source RNC to Target RNC Transparent Container	25.413	Target RNC to Source RNC Transparent Container	25.413
Inter-system handover to E-UTRAN	Source eNB to Target eNB Transparent Container	36.413	Target eNB to Source eNB Transparent Container	36.413

Annex C (informative): Processing of Transparent Containers at the SGSN

Irrespective of the mobility scenario (inter-RAT or intra-UMTS), the SGSN always processes the *Source to Target Transparent Container IE* and the *Target to Source Transparent Container IE* in the following way:

- The SGSN shall convey to the RNC the information received within
 - the GTPv1-C "UTRAN transparent field" of the "UTRAN Transparent Container" IE across the Gn interface (see subclause 7.7.38 of TS 29.060 [35]), or
 - the GTPv2 "F-container field" of the "F-Container" IE across the S3/S16 interface (see subclause 8.48 of TS 29.274 [36])by including it in either the *Source to Target Transparent Container IE* or the *Target to Source Transparent Container* of the corresponding RANAP message.
- The SGSN shall convey to the GTP peer the information received within either the *Source to Target Transparent Container IE* or the *Target to Source Transparent Container IE* by including it in
 - the GTPv1-C "UTRAN transparent field" of the "UTRAN Transparent Container" IE across the Gn interface (see subclause 7.7.38 of TS 29.060 [35]), or
 - the GTPv2 "F-container field" of the "F-Container" IE across the S3/S16 interface (see subclause 8.48 of TS 29.274 [36]).

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62	RP-131909	1260	2	Introduction of SIPTO@LN Stand-Alone in RANAP	12.0.0
63	RP-140297	1253	4	Restoration of MBMS Bearer Services and Connections in RNC	12.1.0
63	RP-140294	1262	1	Introduction of Last E-UTRAN PLMN Identity for CSFB	12.1.0
64	RP-140905	1271	-	Corrections on MBMS Restoration	12.2.0
66	RP-142093	1285	1	Rapporteur Review	12.3.0
66	RP-142094	1288	1	Introduction of the increased value range for RSRQ and new RSRQ definition	12.3.0
66	RP-142084	1289	1	BDS Satellite Specific ICD update to version 2.0	12.3.0
67	RP-150356	1290	-	Correction of RSRQ type values	12.4.0
67	RP-150356	1291	1	Rapporteur Review-ASN.1 consistency check	12.4.0
70	RP-152088	1294	7	Introduction of improvements to CS/PS coordination in UTRAN Shared Network	13.0.0
70	RP-152108	1298	2	Enhancement of the RESET RESOURCE procedure	13.0.0
70	RP-152096	1303	5	Introduction of Dedicated Core Network (DCN) feature	13.0.0
70	RP-152092	1304	3	Support WI Power Saving enhancements for UMTS	13.0.0
70	RP-152016	1307	4	RAT-Independent positioning enhancements for RANAP	13.0.0

History

Document history		
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