Universal Mobile Telecommunications System (UMTS); UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling (3GPP TS 25.413 version 10.5.0 Release 10)
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Foreword

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11 Special Procedures for RNC to RNC Communication

11.1 General

11.2 RANAP Relocation Information

11.2.1 General
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:

Version x.y.z

where:

x the first digit:
  1 presented to TSG for information;
  2 presented to TSG for approval;
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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".
[3] 3GPP TS 25.401: "UTRAN Overall Description".
[4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
[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".
[12] Void
[16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
[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".


[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".


[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".


[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".
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.
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
- BSC: Base Station Controller
- CC: Call Control
- CN: Core Network
- CRNC: Controlling RNC
- CS: Circuit Switched
- CSG: Closed Subscriber Group
- DCH: Dedicated Channel
- 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
- MBMS: Multimedia Broadcast Multicast Service
- 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
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 Information Element Name is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. User Plane Mode 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/lelt 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>
<thead>
<tr>
<th>Elementary Procedure</th>
<th>Initiating Message</th>
<th>Successful Outcome Response message</th>
<th>Unsuccessful Outcome Response message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iu Release</td>
<td>IU RELEASE COMMAND</td>
<td>IU RELEASE COMPLETE</td>
<td></td>
</tr>
<tr>
<td>Relocation Preparation</td>
<td>RELOCATION REQUIRED</td>
<td>RELOCATION COMMAND</td>
<td>RELOCATION PREPARATION FAILURE</td>
</tr>
<tr>
<td>Relocation Resource Allocation</td>
<td>RELOCATION REQUEST</td>
<td>RELOCATION REQUEST ACKNOWLEDGE</td>
<td></td>
</tr>
<tr>
<td>Relocation Cancel</td>
<td>RELOCATION CANCEL</td>
<td>RELOCATION CANCEL ACKNOWLEDGE</td>
<td>RELOCATION FAILURE</td>
</tr>
<tr>
<td>SRNS Context Transfer</td>
<td>SRNS CONTEXT REQUEST</td>
<td>SRNS CONTEXT RESPONSE</td>
<td></td>
</tr>
<tr>
<td>Security Mode Control</td>
<td>SECURITY MODE COMMAND</td>
<td>SECURITY MODE COMPLETE</td>
<td>SECURITY MODE REJECT</td>
</tr>
<tr>
<td>Data Volume Report</td>
<td>DATA VOLUME REPORT REQUEST</td>
<td>DATA VOLUME REPORT</td>
<td></td>
</tr>
<tr>
<td>Reset</td>
<td>RESET</td>
<td>RESET ACKNOWLEDGE</td>
<td></td>
</tr>
<tr>
<td>Location related Data</td>
<td>LOCATION RELATED DATA REQUEST</td>
<td>LOCATION RELATED DATA RESPONSE</td>
<td>LOCATION RELATED DATA FAILURE</td>
</tr>
<tr>
<td>Information Transfer</td>
<td>INFORMATION TRANSFER INDICATION</td>
<td>INFORMATION TRANSFER CONFIRMATION</td>
<td>INFORMATION TRANSFER FAILURE</td>
</tr>
<tr>
<td>Uplink Information Exchange</td>
<td>UPLINK INFORMATION EXCHANGE REQUEST</td>
<td>UPLINK INFORMATION EXCHANGE RESPONSE</td>
<td>UPLINK INFORMATION EXCHANGE FAILURE</td>
</tr>
<tr>
<td>MBMS Session Start</td>
<td>MBMS SESSION START</td>
<td>MBMS SESSION START RESPONSE</td>
<td>MBMS SESSION START FAILURE</td>
</tr>
<tr>
<td>MBMS Session Update</td>
<td>MBMS SESSION UPDATE</td>
<td>MBMS SESSION UPDATE RESPONSE</td>
<td>MBMS SESSION UPDATE FAILURE</td>
</tr>
<tr>
<td>MBMS Session Stop</td>
<td>MBMS SESSION STOP</td>
<td>MBMS SESSION STOP RESPONSE</td>
<td></td>
</tr>
<tr>
<td>MBMS UE Linking</td>
<td>MBMS UE LINKING REQUEST</td>
<td>MBMS UE LINKING RESPONSE</td>
<td></td>
</tr>
<tr>
<td>MBMS Registration</td>
<td>MBMS REGISTRATION REQUEST</td>
<td>MBMS REGISTRATION RESPONSE</td>
<td>MBMS REGISTRATION FAILURE</td>
</tr>
<tr>
<td>MBMS CN De-Registration</td>
<td>MBMS CN DE-REGISTRATION REQUEST</td>
<td>MBMS CN DE-REGISTRATION RESPONSE</td>
<td></td>
</tr>
<tr>
<td>MBMS RAB Release</td>
<td>MBMS RAB RELEASE REQUEST</td>
<td>MBMS RAB RELEASE RESPONSE</td>
<td>MBMS RAB RELEASE FAILURE</td>
</tr>
<tr>
<td>Enhanced Relocation Complete</td>
<td>ENHANCED RELOCATION COMPLETE REQUEST</td>
<td>ENHANCED RELOCATION COMPLETE RESPONSE</td>
<td>ENHANCED RELOCATION COMPLETE FAILURE</td>
</tr>
<tr>
<td>SRVCC Preparation</td>
<td>SRVCC CS KEYS REQUEST</td>
<td>SRVCC CS KEYS RESPONSE</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Class 2

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

Table 3: Class 3

<table>
<thead>
<tr>
<th>Elementary Procedure</th>
<th>Initiating Message</th>
<th>Response Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB Assignment</td>
<td>RAB ASSIGNMENT REQUEST</td>
<td>RAB ASSIGNMENT RESPONSE x N (N&gt;=1)</td>
</tr>
</tbody>
</table>

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

![Diagram of RAB Assignment procedure](image)

*it can be several responses

**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 $T_{\text{RABAssgt}}$ 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 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 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 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.

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 handover to E-UTRAN 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 must stop timer T\textsubscript{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\textsubscript{QUEUING}. This timer specifies the maximum time for queuing of the request for establishment or modification. The same timer T\textsubscript{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\textsubscript{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 $T_{\text{QUEUING}}$ 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 $T_{\text{RABAsgf}}$ timer. In case the timer $T_{\text{RABAsgf}}$ expires, the CN shall consider the RAB Assignment procedure terminated and the RABs not reported shall be considered as failed.

In case the timer $T_{\text{QUEUING}}$ 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 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", "TQUEUING 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 $RABs$ToBeReleased$IE$ at any time and shall always reply to it. If there is an ongoing RAB Assignment procedure for a RAB indicated within the $RABs$ToBeReleased$IE$, 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 $RABs$ToBeSetup$OrModified$Item$IE$s. 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.

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

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.](image)

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

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 $T_{DATA_{fwd}}$ 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.

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.](image)

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 if this has been provided to the RNC.

- may in case a Trace Recording Session is active in the Source RNC due to a Signalling Based Activation (see ref 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 ref 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].

When the source RNC sends the RELOCATION REQUIRED message, it shall start the timer T\textsubscript{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\textsubscript{RELOC_complete}.

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.

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 $T_{RELOCprep}$, start the timer $T_{RELOCOverall}$ 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 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

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. "TRELOCalloc 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 closed access mode 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 $T_{\text{RELOC prep}}$ 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 \textit{Cause} IE, e.g. “$T_{\text{RELOC prep expiry}}$”.

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 \textit{Cause} IE set to “Unknown target RNC”.

2. The CN shall continue to use the existing Iu connection towards the source RNC.

\textbf{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 IEs is the same. In case the Source RNC receives two different Target RNC to Source RNC Transparent Container IEs, the RNC behaviour is left implementation-specific.

\textbf{NOTE:} In case two CN domains are involved in the SRNS Relocation Preparation procedure due to the intersystem 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 \textit{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.

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.

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.

\textbf{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

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 $T_{RELOC\text{alloc}}$.

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).
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 closed 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 CN shall, if supported, use the UESBI-Iu IE when included in the RELOCATION REQUEST message.

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 Permit 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.
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 collect the same type of information as that included 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 can not 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 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 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].

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

![Diagram](image)

Figure 8: Relocation Resource Allocation procedure: Unsuccessful operation.

If the target RNC can not 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 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.
- 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

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

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_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].

8.9.3 Abnormal Conditions

If the timer T_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_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.](image)

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

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\textsubscript{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.](image)

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 initiates 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:
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.

The procedure uses connection oriented signalling.

8.16.2 Successful Operation

![Figure 17: Common ID procedure. Successful operation.](image)

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 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.

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.

If the Management Based MDT Allowed IE is included in the the COMMON ID message, the RNC shall use it, if supported, 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].
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

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.

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

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

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.](image-url)

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 can not 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 can not 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 canceled 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 an other 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 an other 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.

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

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

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 should 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, it shall include the L-GW Transport Layer Address IE in the INITIAL UE MESSAGE message.

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].

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.

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

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, the NAS-PDU IE - i.e. the accept NAS message - and the Redirect 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 Indication IE shall be included in the DIRECT TRANSFER message for the downlink direction.

If the CN can serve the network sharing non-supporting UE, but 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.

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. In this case the Reject Cause Value IE and the associated NAS-PDU IE shall not be stored.

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.](image)

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, it shall include the *L-GW Transport Layer Address* IE in the DIRECT TRANSFER message.

### 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.

### 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 \( T_{itrC} \) 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 \( T_{itrC} \) expires, the traffic should be increased by one step and \( T_{itrC} \) 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 \( T_{itrTR} \) 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 \( T_{itrTR} \) 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 \( T_{itrTR} \) expires, the traffic should be increased by one step and \( T_{itrTR} \) 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

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

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.
In the event of a failure at the UTRAN which has resulted in the loss of transaction reference information, a RESET message shall be sent to all CN nodes towards which the RNC has Iu signalling connections established. This message is used by the CN to release affected Radio Access Bearers and to erase all affected references for the sending RNC.

The RNC shall include the *Global RNC-ID* IE in the RESET message.

After a guard period of $T_{\text{guard}}$ seconds a RESET ACKNOWLEDGE message shall be returned to the UTRAN indicating that all references have been cleared.

When a RESET ACKNOWLEDGE 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.

**Interactions with other procedures:**

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

### 8.26.3 Abnormal Conditions

#### 8.26.3.1 Abnormal Condition at the CN

If the CN sends a RESET message to the RNC and receives no RESET ACKNOWLEDGE message within a period $T_{\text{guard}}$ then it shall repeat the entire Reset procedure. The sending of the RESET message shall be repeated a maximum of “n” times where n is an operator matter. After the n-th unsuccessful repetition the procedure shall be stopped and e.g. the maintenance system be informed.

#### 8.26.3.2 Abnormal Condition at the UTRAN

If the RNC sends a RESET message to the CN and receives no RESET ACKNOWLEDGE message within a period $T_{\text{guard}}$ then it shall repeat the entire Reset procedure. The sending of the RESET message shall be repeated a maximum of “n” times where n is an operator matter. After the n-th unsuccessful repetition the procedure shall be stopped and e.g. the maintenance system be informed.

#### 8.26.3.3 Crossing of Reset Messages

When an entity that has sent a RESET message and is waiting for a RESET ACKNOWLEDGE message, instead receives a RESET message from the peer entity, it shall stop timer $T_{\text{guard}}$ or $T_{\text{guard}}$ and send a RESET ACKNOWLEDGE message to the peer entity.

### 8.27 Error Indication

#### 8.27.1 General

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

If the error situation arises due to reception of a message utilising dedicated signalling, then the Error Indication procedure uses connection oriented signalling. Otherwise the procedure uses connectionless signalling.

#### 8.27.2 Successful Operation

![Figure 31: Error Indication procedure, CN originated. Successful operation.](image-url)
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

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].

The CN DEACTIVATE TRACE message shall contain the Trace Reference IE. The RNC shall stop the trace session for the indicated trace reference in the Trace Reference IE. In case of simultaneous CS/PS connections, the trace session
for the indicated trace reference shall be closed upon reception of the CN DEACTIVATE TRACE message from any of the CN domain, whether it was the one which initiated trace session activation or not.

8.28.2.1 Successful Operation for GERAN Iu mode

The CN DEACTIVATE TRACE message shall contain the Trace Reference IE and may contain the Trigger ID IE. The Trace Reference IE and, if present, the Trigger ID IE are used to indicate which trace shall be stopped.

8.28.3 Abnormal Conditions

Void

8.29 Reset Resource

8.29.1 General

The purpose of the Reset Resource procedure is to initialise part of the UTRAN in the event of an abnormal failure in the CN or vice versa (e.g. Signalling Transport processor reset). The procedure uses connectionless signalling.

8.29.1.1 Reset Resource procedure initiated from the RNC

Void

8.29.1.2 Reset Resource procedure initiated from the CN

Void.

8.29.2 Successful Operation

8.29.2.1 Reset Resource procedure initiated from the RNC

The RNC initiates the procedure by sending a RESET RESOURCE message to the CN.

The RESET RESOURCE message shall include the CN Domain Indicator IE, the Global RNC-ID IE, the Cause IE with the appropriate cause value (e.g. "Signalling Transport Resource Failure") and a list containing Iu Signalling Connection Identifier IEs.

On reception of this message the CN shall release locally the resources and references (i.e. resources and Iu signalling connection identifiers) associated to the Iu signalling connection identifiers indicated in the received message. The CN shall always return the RESET RESOURCE ACKNOWLEDGE message to the RNC when all Iu-related resources and references have been released and shall include the CN Domain Indicator IE and a list of Iu Signalling Connection Identifier IEs. The list of Iu Signalling Connection Identifier IEs within the RESET RESOURCE ACKNOWLEDGE message shall be in the same order as received in the RESET RESOURCE message. Unknown signalling connection identifiers shall be reported as released.

When a RESET RESOURCE ACKNOWLEDGE 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.

Figure 34: RNC initiated Reset Resource procedure. Successful operation.
Both the CN and the RNC shall provide means to prevent the immediate re-assignment of released Iu signalling connection identifiers to minimise the risk that the Reset Resource procedure releases the same Iu signalling connection identifiers re-assigned to new Iu connections.

### 8.29.2.2 Reset Resource procedure initiated from the CN

![Diagram of CN initiated Reset Resource procedure](image)

The CN initiates the procedure by sending a **RESET RESOURCE** message to the RNC.

The **RESET RESOURCE** message shall include the **CN Domain Indicator** IE, the **Cause** IE with the appropriate cause value (e.g. "Signalling Transport Resource Failure") and a list containing **Iu Signalling Connection Identifier** IEs.

When a **RESET RESOURCE** 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.

On reception of this message the RNC shall release locally the resources and references (i.e. radio resources and Iu signalling connection identifiers) associated to the specific CN node and Iu signalling connection identifiers indicated in the received message. The **Global RNC-ID** IE shall not be included in the **RESET RESOURCE** message. If no **Global CN-ID** IE is included in the **RESET RESOURCE** message to indicate the sending CN node, the default CN node for the indicated CN domain shall be considered as sender. The RNC shall always return the **RESET RESOURCE ACKNOWLEDGE** message to the CN when all Iu-related resources and references have been released and shall include the **CN Domain Indicator** IE, a list of **Iu Signalling Connection Identifier** IEs and the **Global RNC-ID** IE. The list of **Iu Signalling Connection Identifier** IEs within the **RESET RESOURCE ACKNOWLEDGE** message shall be in the same order as received in the **RESET RESOURCE** message. Unknown signalling connection identifiers shall be reported as released.

Both the RNC and the CN shall provide means to prevent the immediate re-assignment of released Iu signalling connection identifiers to minimise the risk that the Reset Resource procedure releases the same Iu signalling connection identifiers re-assigned to new Iu connections.

### 8.30 RAB Modification Request

#### 8.30.1 General

The purpose of the RAB Modification Request procedure is to allow the RNC to initiate renegotiation of RABs for a given UE after RAB establishment. The procedure uses connection oriented signalling.

#### 8.30.2 Successful Operation
8.30.3 Abnormal Conditions

Not applicable.

8.31 Location Related Data

8.31.1 General

The purpose of the Location Related Data procedure is to provide the means to handle additional location-related requests over the Iu interface: it 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. The procedure uses connection oriented signalling.
8.31.2 Successful Operation

The CN initiates the procedure by generating a LOCATION RELATED DATA REQUEST message to the RNC.

Upon reception of the LOCATION RELATED DATA REQUEST message, the RNC shall initiate the requested function indicated in the Location Related Data Request Type IE.

The Location Related Data Request Type IE indicates to the RNC whether:

- to start dedicated assistance data delivery to the UE, or
- to send deciphering keys for broadcast assistance data to the CN.

If the LOCATION RELATED DATA REQUEST message included a request for dedicated assistance data delivery to the UE, and if the dedicated assistance data was successfully delivered to the UE, the RNC shall respond to the CN with a LOCATION RELATED DATA RESPONSE message containing no data.

If the LOCATION RELATED DATA REQUEST message included a request for deciphering keys of broadcast assistance data, the RNC shall respond to the CN with a LOCATION RELATED DATA RESPONSE message containing the Broadcast Assistance Data Deciphering Keys IE.

8.31.2.1 Successful Operation for GERAN Iu mode

Upon reception of the LOCATION RELATED DATA REQUEST message, the BSS shall initiate the requested function indicated in the Location Related Data Request Type IE or the Location Related Data Request Type Specific To GERAN Iu Mode IE.

In the sole case of a request for GERAN Iu mode specific positioning method, E-OTD, defined in TS 43.059 [29], the LOCATION RELATED DATA REQUEST message shall include the Location Related Data Request Type Specific To GERAN Iu Mode IE and not the Location Related Data Request Type IE.

The Location Related Data Request Type IE or the Location Related Data Request Type Specific To GERAN Iu Mode IE shall indicate to the BSS whether:

- to start dedicated assistance data delivery to the UE, or
- to send deciphering keys for broadcast assistance data to the CN.
8.31.3 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

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.
8.32.3 Unsuccessful Operation

If the RNC is not able to process the information contained in the Provided Data IE the RNC shall regard the Information Transfer procedure as failed and send the INFORMATION TRANSFER FAILURE message to the CN. The message shall include the same value of the Information Transfer ID IE as received in the INFORMATION TRANSFER INDICATION message and set the Cause IE to an appropriate value.

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

8.32.4 Abnormal Conditions

None.

8.33 UE Specific Information

8.33.1 General

The purpose of the UE Specific Information procedure is to transfer from the CN to the RNC data related to a particular UE and a particular communication.

The procedure uses connection oriented signalling.

8.33.2 Successful Operation

The UE SPECIFIC INFORMATION INDICATION message may include the UESBI-Iu IE.

The RNC shall, if supported, use the UESBI-Iu IE when received in the UE SPECIFIC INFORMATION INDICATION message.
8.34 Direct Information Transfer

8.34.1 General

The purpose of the Direct Information Transfer procedure is to transfer some information from the RNC to the CN or vice versa in unacknowledged mode.

This procedure uses connectionless signalling.

8.34.2 Successful Operation

8.34.2.1 Direct Information Transfer initiated from the RNC

The procedure is initiated with a DIRECT INFORMATION TRANSFER message sent from the RNC to the CN.

The DIRECT INFORMATION TRANSFER message shall include the following IEs:

- Inter-system Information Transfer Type,
- Global RNC-ID,
- CN Domain Indicator,

The *Inter-system Information Transfer Type* IE indicates the nature of the transferred information.

When the transferred information is of RIM nature, the *RIM Information* IE within the *RIM Transfer* IE shall contain a BSSGP RIM PDU. The final RAN destination node where the RIM information needs to be routed by the CN shall be indicated in the *RIM Routing Address* IE within the *RIM Transfer* IE and shall include either the identity of a GSM cell to identify a target BSS, or the identity of a Tracking Area and an eNB to identify the target eNB.

8.34.2.1.1 Successful Operation for GERAN Iu mode

In the case of a Direct Information Transfer procedure initiated from GERAN Iu mode BSC, the final RAN destination node where the RIM information needs to be routed by the CN shall be indicated in the *RIM Routing Address* IE within the *RIM Transfer* IE and may include the identity of either a GSM cell to identify a target BSS or the *Target RNC-ID* IE including the *RAC* IE to identify a target RNC.
8.34.2.2 Direct Information Transfer initiated from the CN

![Diagram of DIRECT INFORMATION TRANSFER from CN to RNC](image_url)

**Figure 43: Information Request procedure. Successful operation.**

The procedure is initiated with a DIRECT INFORMATION TRANSFER message sent from the CN to the RNC.

The DIRECT INFORMATION TRANSFER message shall include the following IEs:

- Inter-system Information Transfer Type,
- CN Domain Indicator,

The DIRECT INFORMATION TRANSFER message may include the following IEs:

- Global CN-ID.

The *Global CN-ID* IE shall be included only when the CN node sending the message is not the default CN node of the RNC.

The *Inter-system Information Transfer Type* IE indicates the nature of the transferred information.

When the transferred information is of RIM nature, the *RIM Information* IE within the *RIM Transfer* IE shall contain a BSSGP RIM PDU. The *RIM Routing Address* IE shall not be present since the RNC is the final destination node.

8.34.3 Abnormal Conditions

Not applicable.

8.35 Uplink Information Exchange

8.35.1 General

The purpose of the Uplink Information Exchange procedure is to transfer or request some information to the CN.

This procedure uses connectionless signalling.
8.35.2 Successful Operation

The procedure is initiated with an UPLINK INFORMATION EXCHANGE REQUEST message sent from the RNC to the CN.

The UPLINK INFORMATION EXCHANGE REQUEST message shall contain the following IEs:

- Information Exchange ID
- Information Exchange Type
- CN Domain Indicator
- Global RNC-ID

The Information Exchange Type IE indicates whether the RNC asks the CN to either transfer or request specific information. If the Information Exchange Type IE is set to the value "transfer", the RNC shall also include in the UPLINK INFORMATION EXCHANGE REQUEST message the Information Transfer Type IE which indicates the nature of the information transferred.

If the Information Exchange Type IE is set to the value "request", the RNC shall also include in the UPLINK INFORMATION EXCHANGE REQUEST message the Information Request Type IE which indicates the nature of the information requested.

When the transferred information in the Information Transfer Type IE relates to a Trace Session in the RNC, the Trace Activation Indicator IE indicates whether the Trace Session identified by the Trace Reference IE is activated or deactivated in the RNC. In case the Trace Session is activated, the Equipments To Be Traced IE gives the Equipment Identity of the UEs that the RNC has to trace.

When the requested information in the Information Request Type IE relates to the Multicast Service list for a given UE identified by its Permanent NAS UE Identity in the Information Request Type IE, this requested information, i.e. the list of Multicast Services the UE has joined, shall be included in the Information Requested IE in the UPLINK INFORMATION EXCHANGE RESPONSE message.

When the requested information in the Information Request Type IE relates to the IP Multicast Address and APN for one or several MBMS bearer service identified by their respective TMGIs in the Information Request Type IE, this requested information, i.e. IP Multicast Address and APN, shall be included in the Information Requested IE in the UPLINK INFORMATION EXCHANGE RESPONSE message.

If the CN node is capable of processing the request or the transfer, the RNC shall be informed by the UPLINK INFORMATION EXCHANGE RESPONSE message. The UPLINK INFORMATION EXCHANGE RESPONSE message shall contain the Information Exchange ID IE and the CN Domain Indicator IE. If the RNC has not sent the UPLINK INFORMATION EXCHANGE REQUEST message to the default CN node, the UPLINK INFORMATION EXCHANGE RESPONSE message shall also include the Global CN-ID IE.
Upon reception of the UPLINK INFORMATION EXCHANGE RESPONSE message including the IP Multicast Address and APN list in the Information Requested IE, the RNC shall store this information in the relevant MBMS Service Contexts.

Upon reception of the UPLINK INFORMATION EXCHANGE RESPONSE message including the Multicast Service list in the Information Requested IE, the RNC shall perform, for each TMGI received, the corresponding UE linking as described in TS 25.346 [42].

8.35.3 Unsuccessful Operation

![Diagram of Uplink Information Exchange procedure. Unsuccessful operation.]

If the CN node is not capable of correctly processing the request or the transfer, the RNC shall be informed by the UPLINK INFORMATION EXCHANGE FAILURE message. The UPLINK INFORMATION EXCHANGE FAILURE message shall contain the Information Exchange ID IE and the CN Domain Indicator IE. If the RNC has not sent the UPLINK INFORMATION EXCHANGE REQUEST message to the default CN node, the UPLINK INFORMATION EXCHANGE FAILURE message shall include the Global CN-ID IE.

The UPLINK INFORMATION EXCHANGE FAILURE message shall inform the RNC about the reason for unsuccessful operation with an appropriate cause value e.g. "MBMS - No Multicast Service For This UE", "MBMS - Unknown UE ID".

8.35.4 Abnormal Conditions

Not Applicable.

8.36 MBMS Session Start

8.36.1 General

The purpose of the MBMS Session Start procedure is to request the UTRAN to notify UEs about an upcoming MBMS Session of a given MBMS Bearer Service and to establish a MBMS RAB and MBMS Iu signalling connection for this MBMS Session. The MBMS Session Start procedure is triggered by the CN (PS domain).

The procedure uses connection oriented signalling.
8.36.2 Successful Operation

![MBMS Session Start procedure](image)

The CN initiates the procedure by sending a MBMS SESSION START message.

The MBMS SESSION START message shall contain:

- TMGI;
- MBMS Bearer Service Type;
- MBMS Session Identity, if available;
- Iu Signalling Connection Identifier IE;
- RAB parameters (including e.g. Allocation/Retention Priority);
- PDP Type Information, if available;
- PDP Type Information extension, if available;
- MBMS Session Duration;
- MBMS Service Area;
- Frequency Layer Convergence Flag, if available;
- RA List of Idle Mode UEs, if available;
- Global CN-ID IE, only when the MBMS SESSION START message is sent from a CN node towards an RNC for which the sending CN node is not the default CN node;
- MBMS Session Repetition Number, if available;
- Time to MBMS Data Transfer;
- MBMS Counting Information, if available.

Upon reception of the MBMS SESSION START message, the RNC shall store the Iu Signalling Connection Identifier IE for the duration of the MBMS Iu signalling connection. 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 Global CN-ID IE contains the identity of the CN node that sent the MBMS SESSION START 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 MBMS SESSION START message shall be considered as coming from the default CN node.
Upon reception of the MBMS SESSION START message, the RNC shall store, if not already, and remember the TMGI IE, the RAB parameters IE and the other attributes of the session as part of the MBMS Service Context. The TMGI IE contains the TMGI identifier which uniquely identifies the MBMS Bearer Service.

If the MBMS Bearer Service Type IE is set to "Multicast", upon reception of the MBMS SESSION START message, the RNC shall initiate allocation of requested resources for the MBMS RAB at a proper point in time if at least one of the following two conditions is fulfilled:

- the RNC controls at least one cell contained in the indicated MBMS Service Area and, if the RA List of Idle Mode UEs IE is included in MBMS SESSION START message, at least one RNC’s RA is contained in this list, or if Empty/Full RA List of Idle Mode UEs IE included in MBMS SESSION START message is set to "fulllist",
- the RNC serves UEs consuming radio resources from cells contained in the indicated MBMS Service Area.

If no mapping is configured for a certain MBMS Service Area Identity in the MBMS Service Area IE in the RNC it shall simply ignore it.

The RNC may optimise the point in time when the resource allocation is initiated based on the Time to MBMS Data Transfer IE.

In case the RA List of Idle Mode UEs IE is included in MBMS SESSION START message but none of above conditions is fulfilled, the RNC may decide to wait for either an update of the RA List of Idle Mode UEs or a UE linking to finally establish the MBMS RAB. If the RNC decides so, it shall report it immediately to the CN in the MBMS SESSION START RESPONSE message with the cause value "Successful MBMS Session Start - No Data Bearer Necessary" and maintain an Iu signalling connection.

If the Empty/Full RA List of Idle Mode UEs IE included in MBMS SESSION START message is set to "fulllist", the RNC shall initiate the MBMS Notification over the Uu interface in all the cells under its control which belong to the indicated MBMS service area.

If the MBMS Bearer Service Type IE is set to "Broadcast", the MBMS Counting Information IE shall be included in the MBMS SESSION START message. If the MBMS Counting Information IE is set to "counting", the RNC may apply MBMS counting.

If the MBMS Bearer Service Type IE is set to "Broadcast" upon reception of the MBMS SESSION START message, the RNC shall initiate allocation of requested resources for the MBMS RAB at a proper point in time if it controls at least one cell contained in the indicated MBMS Service Area.

If the MBMS Bearer Service Type IE is set to "Multicast" the MBMS Counting Information IE shall be ignored.

The allocation of requested resources shall be made according to the values of the Allocation/Retention Priority IE (priority level, pre-emption indicators) and the resource situation as follows:

- The RNC shall consider the priority level of the requested MBMS RAB, when deciding on the resource allocation.
- The Queuing Allowed IE shall be ignored for MBMS RAB.
- The priority levels and the pre-emption indicators may (singularly or in combination) be used to determine whether the MBMS RAB establishment has to be performed unconditionally and immediately. If the requested MBMS 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 MBMS SESSION START message, shall be treated as follows:
  1. If the Pre-emption Capability IE is set to "may trigger pre-emption", then this allocation request may trigger the pre-emption procedure. UTRAN shall only pre-empt RABs (other MBMS RABs or UE specific RABs) with lower priority, in ascending order of priority.
  2. 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.
  3. If the Pre-emption Vulnerability IE is set to "pre-emptable", then this connection shall be included in the pre-emption process.
4. If the *Pre-emption Vulnerability* IE is set to "not pre-emptable", then this connection shall not be included in the pre-emption process.

5. 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 MBMS SESSION START 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 shall use the *PDP Type Information* IE or *PDP Type Information extension* IE to configure any compression algorithms.

The MBMS SESSION START message may contain the *MBMS Synchronisation Information* IE, consisting of the

- *MBMS HC Indicator* IE;
- *IP Multicast Address* IE;
- *GTP DL TEID* IE;
- *IP Source Address* IE, if available.

In case of successful MBMS RAB establishment, if the *MBMS Synchronisation Information* IE was not received within the MBMS SESSION START message, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the MBMS SESSION START RESPONSE message. The RNC may answer successfully even though the MBMS resources have not been established in all relevant cells.

If NNSF is active, the RNC may receive from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message. In this case, if the RNC decides to establish the requested MBMS RAB, it shall only establish one MBMS Iu bearer and shall inform the selected CN node accordingly i.e. with MBMS SESSION START RESPONSE message including the *Transport Layer Address* IE and the *Iu Transport Association* IE.

If the *MBMS Synchronisation Information* IE was received within the MBMS SESSION START message, even if the RNC received related information more than once due to NNSF, if supported, it shall not include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the MBMS SESSION START RESPONSE message. In case of successful joining the indicated IP Multicast group, the RNC shall inform all the CN nodes from which it has received a MBMS SESSION START message for that MBMS service with the *Cause* IE set to "Successful MBMS Session Start – IP Multicast Bearer established". If the *IP Source Address* IE is contained in the *MBMS Synchronisation Information* IE, the RNC shall use this information for joining the IP Multicast group.

If the RNC receives from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message and all the MBMS SESSION START messages include the *RA List of Idle Mode UEs* IE, the RNC shall, if supported, maintain an MBMS Iu signalling connection towards all the CN nodes and inform them accordingly i.e. with MBMS SESSION START RESPONSE message and cause value "Successful MBMS Session Start - No Data Bearer Necessary" to all the CN nodes except the one, if any, towards which the RNC confirmed the successful MBMS RAB establishment.

The *MBMS Session Repetition Number* IE may be included in the MBMS SESSION START message in case the *MBMS Session Identity* IE is included in the same message. The *MBMS Session Repetition Number* IE may be used by RNC to recognise retransmissions of a particular session of a MBMS Bearer Service with identical contents. This IE may be used for counting purpose.

When the *Frequency Layer Convergence Flag* IE is set to "no-FLC-flag", the RNC is being requested to not apply any frequency layer convergence mechanism. The service shall then be delivered to all cells of all the MBMS Service Area Identities indicated in the *MBMS Service Area* IE.

Transmission and reception of a MBMS SESSION START RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.
8.36.3 Unsuccessful Operation

If the RNC is not capable of correctly processing the request (e.g. the MBMS resources could not be established at all in any cell), the CN shall be informed by the MBMS SESSION START FAILURE message.

If the MBMS Bearer Service Type IE is set to “Broadcast” upon reception of the MBMS SESSION START message and the RNC doesn’t have any cell contained in the indicated MBMS Service Area, it shall report it immediately to the CN in the MBMS SESSION START FAILURE message with the cause value "MBMS - No cell in MBMS Service Area”.

If NNSF is active and the RNC received from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message, but not all of the MBMS SESSION START messages include the RA List of Idle Mode UEs IE, the RNC shall inform the respective CN nodes accordingly i.e. with MBMS SESSION START FAILURE message and cause value "MBMS - Superseded Due To NNSF” to all the CN nodes except the one towards which the RNC confirmed the successful MBMS RAB establishment with MBMS SESSION START RESPONSE message.

When UTRAN reports failure of the MBMS Session Start procedure, the cause value should be precise enough to enable the core network to know the reason for the failure. Typical cause values are: "MBMS - Superseded Due To NNSF", "Requested Traffic Class not Available", "Invalid RAB Parameters Value", "Requested Maximum Bit Rate not Available", "Requested Guaranteed Bit Rate not Available", "Requested Transfer Delay not Achievable", "Invalid RAB Parameters Combination", "Condition Violation for Guaranteed Bit Rate", "Iu Transport Connection Failed to Establish", "No Resource Available”.

Transmission and reception of a MBMS SESSION START FAILURE message terminate the procedure in the UTRAN and in the CN respectively.

8.36.4 Abnormal Conditions

If, for a MBMS RAB requested to be set up, the PDP Type Information IE and/or PDP Type Information extension IE is not present, the RNC shall continue with the procedure.

If a an MBMS SESSION START message from a given CN Node provides a TMGI IE that is used for an already established and running MBMS Session provided by the same CN Node, and the indicated MBMS Service Area IE refers to an MBMS Service Area that is partially or completely overlapping with the MBMS Service Area of the already established and running MBMS Session, then the RNC shall return an MBMS SESSION START FAILURE message with the cause value “TMGI in Use and overlapping MBMS Service Area”.

If an MBMS SESSION START message from a given CN Node provides a TMGI IE that is used for an already established and running MBMS Session provided by another CN Node, and the indicated MBMS Service Area IE refers to a different MBMS Service Area that is partially overlapping with the MBMS Service Area of the already established and running MBMS Session, then the RNC shall return an MBMS SESSION START FAILURE message with the cause value “TMGI in Use and overlapping MBMS Service Area”.

Figure 47: MBMS Session Start procedure. Unsuccessful operation.
8.37 MBMS Session Update

8.37.1 General

The purpose of the MBMS Session Update procedure is to inform the RNC during a MBMS Session whenever the RA List of Idle Mode UEs changes compared to one previously sent. The MBMS Session Update procedure is triggered by the CN (PS domain).

The procedure uses connection oriented signalling.

8.37.2 Successful Operation

The CN initiates the procedure by sending a MBMS SESSION UPDATE message.

The MBMS SESSION UPDATE message shall contain the **Delta RA List of Idle Mode UEs IE** and the **Session Update ID IE**.

Upon reception of the MBMS SESSION UPDATE message, if a MBMS RAB has already been established, the RNC shall initiate allocation of additional MBMS radio resources for this MBMS RAB if the RNC controls at least one cell that is part of both the MBMS Service Area and one of the RNC’s RAs indicated in the **New RA List of Idle Mode UEs IE**, if this IE is included in the **Delta RA List of Idle Mode UEs IE** group. The RNC may release the existing MBMS radio resources for the cells part of the RNC’s RAs indicated in the **RA List with No Idle Mode UEs Any More IE**, if this IE is included in the **Delta RA List of Idle Mode UEs IE** group.

Upon reception of the MBMS SESSION UPDATE message, if no MBMS RAB has yet been established, the RNC shall establish the MBMS RAB if the RNC controls at least one cell that is part of both the MBMS Service Area and one of the RNC’s RAs indicated in the **New RA List of Idle Mode UEs IE**, if this IE is included in the **Delta RA List of Idle Mode UEs IE** group. If the previous condition is not fulfilled, the RNC may decide to wait for either another update of the RA List of Idle Mode UEs or a UE linking to finally establish the MBMS RAB.

In case of successful MBMS RAB establishment, the RNC shall include the **Transport Layer Address IE** and the **Iu Transport Association IE** in the MBMS SESSION UPDATE RESPONSE message.

When the update of the RA List of Idle Mode UEs is successfully executed, the UTRAN shall report it to the CN in the MBMS SESSION UPDATE RESPONSE message, which shall include the same **Session Update ID IE** as received in the MBMS SESSION UPDATE message. The RNC may answer successfully even though MBMS resources have not been established in all relevant cells.

Transmission and reception of a MBMS SESSION UPDATE RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.
8.37.3 Unsuccessful Operation

If the RNC is not capable of correctly processing the request (e.g. additional MBMS resources could not be established at all in any cell), the CN shall be informed by the MBMS SESSION UPDATE FAILURE message, which shall include the same Session Update ID IE as received in the MBMS SESSION UPDATE message.

Transmission and reception of a MBMS SESSION UPDATE FAILURE message terminate the procedure in the UTRAN and in the CN respectively.

8.37.4 Abnormal Conditions

Not applicable.

8.38 MBMS Session Stop

8.38.1 General

The purpose of the MBMS Session Stop procedure is to request the UTRAN to notify UEs about the end of a given MBMS Session and to release the corresponding MBMS RAB and MBMS Iu signalling connection for this MBMS Session. The MBMS RAB Session Stop procedure may also be used as the last MBMS session stop to make the RNC aware that a certain Multicast Service is no longer available. The MBMS Session Stop procedure is triggered by the CN (PS domain).

The procedure uses connection oriented signalling.
8.38.2 Successful Operation

The CN initiates the procedure by sending a MBMS SESSION STOP message.

Upon reception of the MBMS SESSION STOP message, the RNC shall release all allocated resources for the MBMS RAB, including the MBMS Iu signalling connection used for this MBMS RAB.

The MBMS SESSION STOP message shall include the MBMS CN De-Registration IE. If the MBMS CN De-Registration IE is set to the value "deregister", the RNC shall also remove all associated MBMS Service Context(s) and release all allocated MBMS resources for the MBMS Bearer Service.

The RNC does not need to wait for the release of all UTRAN radio resources before returning the MBMS SESSION STOP RESPONSE message.

In case of successful release of the MBMS Iu signalling connection, after the MBMS SESSION STOP RESPONSE message has been sent, the CN shall not send further RANAP connection-oriented messages on this particular connection.

Transmission and reception of a MBMS SESSION STOP RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.

8.38.3 Abnormal Conditions

Not applicable.

8.39 MBMS UE Linking

8.39.1 General

The purpose of the MBMS UE Linking procedure is to make the RNC aware that a given UE, with existing Iu-ps signalling connection, joined and/or left one or several Multicast Services.

The procedure uses connection oriented signalling.
8.39.2 Successful Operation

The CN initiates the procedure by sending a MBMS UE LINKING REQUEST message.

The MBMS UE LINKING REQUEST message shall contain the following IEs:

- a list of one or several TMGIs, each identifying the MBMS Bearer Service that the UE joined or left and which has not yet been linked or unlinked respectively in the UTRAN;
- for each of the MBMS Bearer Services that the UE joined;
- the PTP RAB ID.

Upon reception of the MBMS UE LINKING REQUEST message, for each TMGI received identifying the MBMS Bearer Service that the UE joined and which has not yet been linked in the UTRAN, the RNC shall perform the corresponding UE linking as described in TS 25.346 [42].

Upon reception of the MBMS UE LINKING REQUEST message, for each TMGI received identifying the MBMS Bearer Service that the UE left and which has not yet been de-linked in the UTRAN, the RNC shall perform the corresponding UE de-linking as described in TS 25.346 [42].

After handling all received TMGI(s), the RNC shall only report to the CN in the MBMS UE LINKING RESPONSE message the unsuccessful linking(s)/de-linking(s) with an appropriate cause value e.g. "MBMS - UE Linking Already Done", "MBMS - UE De-Linking Failure - No Existing UE Linking".

Transmission and reception of a MBMS UE LINKING RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.

8.39.3 Unsuccessful Operation

The unsuccessful operation for this Class 1 Elementary procedure is described under the Successful Operation chapter.

8.39.4 Abnormal Conditions

Upon reception of the MBMS UE LINKING REQUEST message, if for a given TMGI received identifying the MBMS Bearer Service that the UE joined, the linking has already been done in the UTRAN, the RNC shall consider this linking as unsuccessful but shall proceed with the other ones.

Upon reception of the MBMS UE LINKING REQUEST message, if a given TMGI received identifying the MBMS Bearer Service that the UE left, cannot be found in the UE context, the RNC shall consider this de-linking as unsuccessful but shall proceed with the other ones.
8.40 MBMS Registration

8.40.1 General

The purpose of the MBMS Registration procedure is to request the CN (PS domain) to register or de-register the RNC for a certain Multicast Service.

The procedure uses connectionless signalling, unless the procedure is used to request CN to de-register the RNC for a Multicast Service which has an existing Iu signalling connection towards the RNC i.e. during a MBMS Session. In this last case, the procedure uses connection oriented signalling.

8.40.2 Successful Operation

Figure 52: MBMS Registration procedure. Successful operation.

The RNC initiates the procedure by sending a MBMS REGISTRATION REQUEST message.

The MBMS REGISTRATION REQUEST message shall contain the following IEs:

- MBMS Registration Request type;
- TMGI;
- The associated IP Multicast Address and the APN corresponding to the MBMS Bearer Service identified by the TMGI, only in the case the MBMS Registration Request type IE is set to "register";
- Global RNC-ID, if connectionless signalling.

If the CN node is capable of processing the request, the RNC shall be informed by the MBMS REGISTRATION RESPONSE message.

In case of connectionless signalling the MBMS REGISTRATION RESPONSE message shall contain the same TMGI as received in the MBMS REGISTRATION REQUEST message.

If the RNC has not sent the MBMS REGISTRATION REQUEST message with the MBMS Registration Request Type IE set to "register", to the default CN node, the MBMS REGISTRATION RESPONSE message shall also include the Global CN-ID IE.

Upon reception of the MBMS REGISTRATION RESPONSE message as a response to a connectionless MBMS REGISTRATION REQUEST message with the MBMS Registration Request Type IE set to "deregister", the RNC shall remove all associated MBMS resources and context(s) corresponding to the MBMS Bearer Service identified by the TMGI included in the MBMS REGISTRATION REQUEST message.

Upon reception of the MBMS REGISTRATION RESPONSE message as a response to a connection oriented MBMS REGISTRATION REQUEST message with the MBMS Registration Request Type IE set to "deregister", the RNC shall release the MBMS Iu signalling connection and the RAB, if any, identified by the TMGI included in the MBMS REGISTRATION REQUEST message.
Transmission and reception of a MBMS REGISTRATION RESPONSE message terminate the procedure in the CN and in the UTRAN respectively.

### 8.40.3 Unsuccessful Operation

![Diagram](image)

**Figure 53: MBMS Registration procedure. Unsuccessful operation.**

If the CN node is not capable of correctly processing the request, the RNC shall be informed by the MBMS REGISTRATION FAILURE message.

In case of connectionless signalling, the MBMS REGISTRATION FAILURE message shall contain the same TMGI as received in the MBMS REGISTRATION REQUEST message.

The MBMS REGISTRATION FAILURE message shall inform the RNC about the reason for unsuccessful operation thanks to appropriate cause value e.g. "TMGI Unknown", "IP Multicast Address And APN Not Valid", "MBMS De-Registration Rejected Due To Implicit Registration", "MBMS - Request Superseded", "MBMS De-Registration During Session Not Allowed".

In case of connectionless signalling, if the RNC has not sent the MBMS REGISTRATION REQUEST message with the MBMS Registration Request Type IE set to "register", to the default CN node, the MBMS REGISTRATION FAILURE message shall also include the Global CN-ID IE.

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

### 8.40.4 Abnormal Conditions

Not applicable.

### 8.41 MBMS CN De-Registration

#### 8.41.1 General

The purpose of the MBMS CN De-Registration procedure is to make the RNC aware that a certain Multicast Service is no longer available. The MBMS CN De-Registration procedure is triggered by the CN (PS domain).

The procedure uses connectionless signalling.
8.41.2  Successful Operation

The CN initiates the procedure by sending a MBMS CN DE-REGISTRATION REQUEST message.

The MBMS CN DE-REGISTRATION REQUEST message shall contain the following IEs:

- TMGI;
- Global CN-ID IE, only when the MBMS CN DE-REGISTRATION REQUEST message is sent from a CN node towards an RNC for which the sending CN node is not the default CN node.

If the Global CN-ID IE is not included, the MBMS CN DE-REGISTRATION REQUEST message shall be considered as coming from the default CN node.

Upon reception of the MBMS CN DE-REGISTRATION REQUEST message, the RNC shall remove all associated MBMS context(s) and resources corresponding to the MBMS Bearer Service identified by the indicated TMGI and shall report it to the CN by sending the MBMS CN DE-REGISTRATION RESPONSE message.

Upon reception of the MBMS CN DE-REGISTRATION REQUEST message, if no existing MBMS Bearer Service can be identified by the indicated TMGI in the RNC, it shall consider this MBMS CN De-Registration procedure unsuccessful and shall report it to the CN by sending the MBMS CN DE-REGISTRATION RESPONSE message with the appropriate cause value e.g. "TMGI unknown".

The MBMS CN DE-REGISTRATION RESPONSE message shall contain the Global RNC-ID IE and the same TMGI as received in the MBMS CN DE-REGISTRATION REQUEST message.

Transmission and reception of a MBMS CN DE-REGISTRATION RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.

8.41.3  Unsuccessful Operation

The unsuccessful operation for this Class 1 Elementary procedure is described under the Successful Operation chapter.

8.41.4  Abnormal Conditions

If NNSF is active, the RNC may receive from several CN nodes for a certain MBMS Bearer Service the MBMS CN DE-REGISTRATION REQUEST message. In this case the RNC will only proceed with the first MBMS CN DE-REGISTRATION REQUEST message received and will inform the respective CN nodes accordingly i.e. with MBMS CN DE-REGISTRATION RESPONSE message and cause value “TMGI unknown” to all the CN nodes except the one towards which the RNC confirmed the successful the MBMS CN De-Registration procedure with MBMS CN DE-REGISTRATION RESPONSE message including no cause value.
8.42 MBMS RAB Establishment Indication

8.42.1 General

The purpose of the MBMS RAB Establishment Indication procedure is to inform the CN (PS domain) of the establishment of the MBMS RAB corresponding to the MBMS Iu signalling connection used for this procedure. The procedure uses connection oriented signalling.

8.42.2 Successful Operation

![Diagram of MBMS RAB Establishment Indication procedure. Successful operation.]

When the RNC has not yet established the MBMS RAB for a particular Multicast Service and is informed that a given UE joined this particular Multicast Service, the RNC shall initiate the MBMS RAB Establishment Indication procedure and send the MBMS RAB ESTABLISHMENT INDICATION message to the CN. If NNSF is active, the selection of the CN node is implementation dependant.

The MBMS RAB ESTABLISHMENT INDICATION message shall include the Transport Layer Address IE and the Iu Transport Association IE.

8.42.3 Abnormal Conditions

Not applicable.

8.43 MBMS RAB Release

8.43.1 General

The purpose of the MBMS RAB Release procedure is to enable the UTRAN to request the release of an MBMS RAB. The MBMS RAB is defined for the PS domain only. The procedure uses connection oriented signalling.
8.43.2 Successful Operation

The RNC initiates the procedure by generating a MBMS RAB RELEASE REQUEST message towards the CN. The MBMS RAB RELEASE REQUEST message is sent on the Iu connection related to the MBMS RAB to be released. The included cause value indicates the reason for the release, e.g. “RAB pre-empted”, “Release due to UTRAN Generated Reason”, “MBMS - No Data Bearer Necessary”.

The CN should according to the MBMS RAB RELEASE REQUEST message initiate the release of all MBMS resources related to the Iu connection.

For MBMS Multicast service the Iu signalling connection should not be released.

The RNC may at reception of MBMS RAB RELEASE initiate release of the related MBMS bearer resources.

**MBMS Broadcast service, interaction with MBMS Session Stop:**

For MBMS Broadcast service the CN may initiate the appropriate release procedure for the MBMS Session related to the Iu signalling connection and invoke the MBMS Session Stop procedure.

8.43.3 Unsuccessful Operation

If the CN node is not capable of correctly processing the request, the RNC shall be informed by the MBMS RAB RELEASE FAILURE message.

The MBMS RAB RELEASE FAILURE message shall inform the RNC about the reason for the unsuccessful operation with an appropriate cause value.

8.43.4 Abnormal Conditions

Not applicable.
8.44 Enhanced Relocation Complete

8.44.1 General

The purpose of the Enhanced Relocation Complete procedure is to inform the CN that the resources have been allocated by the target RNC. The target RNC provides necessary information to the CN to switch the user plane to the target RNC.

The procedure uses connection oriented signalling.

8.44.2 Successful Operation

![Enhanced Relocation Complete procedure diagram]

The RNC initiates the procedure by sending the ENHANCED RELOCATION COMPLETE REQUEST message to the CN.

If the RABs Setup List IE in the ENHANCED RELOCATION COMPLETE REQUEST message does not include all RABs previously established for the UE, the CN shall consider the non included RABs as implicitly released by the RNC.

For each RAB the resource allocation was successful 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 RABs Setup List IE in the ENHANCED RELOCATION COMPLETE REQUEST message. If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the ENHANCED RELOCATION COMPLETE REQUEST message within the Assigned RAB Parameter Values IE.

NOTE: If ALCAP is not used, the RNC shall include the same kind of TNL information (i.e. IPv4 or IPv6) as received from the source RNC in the RANAP ENHANCED RELOCATION INFORMATION REQUEST message.

The target RNC shall include the Chosen Integrity Protection Algorithm IE (Chosen Encryption Algorithm IE respectively) within the ENHANCED RELOCATION COMPLETE REQUEST 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 of the RANAP ENHANCED RELOCATION INFORMATION message.

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

After all necessary updates including the DL transport layer information have been successfully completed in the CN, the CN shall send the ENHANCED RELOCATION COMPLETE RESPONSE message to the RNC.

In case the CN failed to setup for at least one of the RABs included the RABs Setup List IE in the ENHANCED RELOCATION COMPLETE REQUEST message, the CN shall include the RABs it failed to setup in the RABs To Be Released List IE in the ENHANCED RELOCATION COMPLETE RESPONSE message. In this case, the RNC shall
release the resource for the RABs and the RNC shall regard the RABs indicated in the RABs To Be Released List IE as being fully released.

The ENHANCED RELOCATION COMPLETE RESPONSE message shall contain the User Plane Information IE.

The ENHANCED RELOCATION COMPLETE RESPONSE message shall contain the Transport Layer Address IE and the Binding ID IE for each RAB towards the CS domain when an ALCAP is used.

In case the CN decides to change the uplink transport layer information when an ALCAP is not used it may include the Transport Layer Address IE and the Binding ID IE within the RABs Setup List IE in the ENHANCED RELOCATION COMPLETE RESPONSE message.

The ENHANCED RELOCATION COMPLETE RESPONSE message may contain the RAB Parameters IE for each RAB towards the CS domain in RAB Setup List.

If the RAB Parameters IE is included in the ENHANCED RELOCATION COMPLETE RESPONSE the RNC shall
- replace the previously provided RAB Parameter for the RAB. The RNC shall use the received RAB Parameter for the RAB.

If the RAB Parameters IE is not contained in the ENHANCED RELOCATION COMPLETE RESPONSE message, the RNC shall use the previously provided RAB parameters.

The ENHANCED RELOCATION COMPLETE RESPONSE message may contain the UE Aggregate Maximum Bit Rate IE to control the aggregate data rate of non-GBR traffic for this UE.

If the UE Aggregate Maximum Bit Rate IE is contained in the ENHANCED RELOCATION COMPLETE RESPONSE message, the RNC shall, if supported,
- replace the previously provided UE Aggregate Maximum Bit Rate Parameter for this UE. The RNC shall use the received UE Aggregate Maximum Bit Rate Parameter for this UE.

If the UE Aggregate Maximum Bit Rate IE is not contained in the ENHANCED RELOCATION COMPLETE RESPONSE message, the RNC shall, if supported, use the previously provided UE Aggregate Maximum Bit Rate Parameter.

In case SIPTO at Iu-PS functionality is supported by the UTRAN, the following applies in addition for the successful operation of Enhanced Relocation Complete procedure:
- If the MSISDN IE is present in the ENHANCED RELOCATION COMPLETE RESPONSE message, then the UTRAN may offload the RAB(s) where the Offload RAB Parameters IE is present in the RABs 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].

8.44.3 Unsuccessful Operation

![Figure 69: Enhanced Relocation Complete procedure. Unsuccessful operation.](image-url)
If a failure occurs in the CN during the execution of the relocation procedure, the CN shall send the ENHANCED RELOCATION COMPLETE FAILURE message to the RNC with an appropriate cause value. The RNC shall assume the Iu resources between the old source RNC and the CN node being released by the respective CN node.

8.45 Enhanced Relocation Complete Confirm

8.45.1 General

The purpose of the Enhanced Relocation Complete Confirm procedure is to indicate the CN (applicable towards the CS domain only) to switch the bearers towards the target RNC. The procedure uses connection-oriented signalling.

8.45.2 Successful Operation

![Figure 70: Enhanced Relocation Complete Confirm procedure. Successful operation.](image)

The RNC shall initialise the Enhanced Relocation Complete Confirm procedure by sending the ENHANCED RELOCATION COMPLETE CONFIRM message. If the RNC is not able to successfully initialise RABs for which an Iu user plane initialisation is necessary, it shall provide respective information within the RABs Failed To Initialise List IE with an appropriate cause value.

8.46 SRVCC Preparation

8.46.1 General

The purpose of the SRVCC Preparation procedure is the reception of the security parameters from the PS CN domain needed for successful SRVCC operation as described in TS 23.216 [54].

The procedure uses connection oriented signalling.

8.46.2 Successful Operation

![Figure 46.1: SRVCC Preparation procedure. Successful operation.](image)

The RNC shall determine if the SRVCC operation as described in TS 23.216 [54] is required. In such case the RNC shall initiate the SRVCC Preparation procedure by sending an SRVCC CS KEYS REQUEST message to the source SGSN.
The SGSN shall respond to the RNC with SRVCC CS KEYS RESPONSE message containing the *Integrity Protection Key* IE, the *Encryption Key* IE and the *SRVCC Information* IE.

8.46.2 Abnormal Conditions

Not applicable.

9 Elements for RANAP Communication

9.1 Message Functional Definition and Content

9.1.1 General

Subclause 9.1 presents the contents of RANAP messages in tabular format. The corresponding ASN.1 definition is presented in subclause 9.3. In case there is contradiction between the tabular format in subclause 9.1 and the ASN.1 definition, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional IEs, where the tabular format shall take precedence.

NOTE: The messages have been defined in accordance to the guidelines specified in TR 25.921 [18].
9.1.2 Message Contents

9.1.2.1 Presence

All information elements in the message descriptions below are marked mandatory, optional or conditional according to table 4.

### Table 4: Meaning of abbreviations used in RANAP messages

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>IEs marked as Mandatory (M) shall always be included in the message.</td>
</tr>
<tr>
<td>O</td>
<td>IEs marked as Optional (O) may or may not be included in the message.</td>
</tr>
<tr>
<td>C</td>
<td>IEs marked as Conditional (C) shall be included in a message only if the condition is satisfied. Otherwise the IE shall not be included.</td>
</tr>
</tbody>
</table>

9.1.2.2 Criticality

Each Information Element or Group of Information Elements may have criticality information applied to it. Following cases are possible:

### Table 5: Meaning of content within "Criticality" column

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>No criticality information is applied explicitly.</td>
</tr>
<tr>
<td>YES</td>
<td>Criticality information is applied. This is usable only for non-repeatable IEs</td>
</tr>
<tr>
<td>GLOBAL</td>
<td>The IE and all its repetitions together have one common criticality information. This is usable only for repeatable IEs.</td>
</tr>
<tr>
<td>EACH</td>
<td>Each repetition of the IE has its own criticality information. It is not allowed to assign different criticality values to the repetitions. This is usable only for repeatable IEs.</td>
</tr>
</tbody>
</table>

9.1.2.3 Range

The Range column indicates the allowed number of copies of repetitive IEs/IE groups.

9.1.2.4 Assigned Criticality

This column provides the actual criticality information as defined in subclause 10.3.2, if applicable.

9.1.3 RAB ASSIGNMENT REQUEST

This message is sent by the CN to request the establishment, modification or release of one or more RABs for the same UE.

**Direction:** CN→RNC.

**Signalling bearer mode:** Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>RABs To Be Setup Or Modified List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RABs To Be Setup Or Modified Item IEs</td>
<td></td>
<td>1 to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;First Setup Or Modify Item</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td>Grouping reason: same criticality</td>
<td>EACH</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;NAS Synchronisation Indicator</td>
<td>O</td>
<td></td>
<td>9.2.3.18</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAB Parameters</td>
<td>O</td>
<td></td>
<td>9.2.1.3</td>
<td>Includes all necessary parameters for RABs (both for MSC and SGSN) including QoS.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;User Plane Information</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;UP Mode</td>
<td>M</td>
<td></td>
<td>9.2.1.18</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;UP Mode Versions</td>
<td>M</td>
<td></td>
<td>9.2.1.19</td>
<td></td>
<td>-</td>
<td></td>
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<td>&gt;&gt;&gt;Transport Layer Information</td>
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<td>M</td>
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<td>-</td>
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<td>&gt;&gt;&gt;Service Handover</td>
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<td>&gt;&gt;&gt;Correlation ID</td>
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<td>&gt;&gt;Second Setup Or Modify Item</td>
<td>M</td>
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<td>9.2.1.40</td>
<td>Grouping reason: same criticality</td>
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<td>&gt;&gt;&gt;Data Volume Reporting Indication</td>
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<td>9.2.1.34</td>
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<td>&gt;&gt;&gt;GERAN BSC Container</td>
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<td>O</td>
<td>9.2.1.40a</td>
<td>The PDP Type Information extension IE can only be included if PDP Type Information IE is not present.</td>
<td>YES</td>
<td>ignore</td>
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<tr>
<td>--------------------------------</td>
<td>---</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Offload RAB parameters</td>
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<td>9.2.1.94</td>
<td>Applicable only for SIPTO at Iu-PS</td>
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<td>O</td>
<td></td>
<td>YES</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>RABs To Be Released Item IEs</td>
<td>O</td>
<td></td>
<td>YES</td>
<td>ignore</td>
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<td></td>
</tr>
<tr>
<td>RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td>-</td>
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<td></td>
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<tr>
<td>UE Aggregate Maximum Bit Rate</td>
<td>O</td>
<td>9.2.1.91</td>
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<tr>
<td>MSISDN</td>
<td>O</td>
<td>9.2.1.95</td>
<td>Applicable only for SIPTO at Iu-PS</td>
<td>YES</td>
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<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
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**9.1.4 RAB ASSIGNMENT RESPONSE**

This message is sent by the RNC to report the outcome of the request from the RAB ASSIGNMENT REQUEST message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
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<tbody>
<tr>
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<td></td>
<td>9.2.1.1</td>
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<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>RABs Setup Or Modified List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Setup Or Modified Item IEs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>1 to</td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;DL Data Volumes</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Data Volume List</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt;Unsuccessfully Transmitted DL Data Volume</td>
<td>M</td>
<td></td>
<td>9.2.3.12</td>
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<td>&gt;&gt;Assigned RAB Parameter Values</td>
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<td>9.2.1.44</td>
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<td>RABs Released List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Released Item IEs</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>1 to</td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;DL Data Volumes</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Data Volume List</td>
<td></td>
<td></td>
<td>1 to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt;Unsuccessfully Transmitted DL Data Volume</td>
<td>M</td>
<td></td>
<td>9.2.3.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt;Data Volume Reference</td>
<td>O</td>
<td></td>
<td>9.2.3.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;DL GTP-PDU Sequence Number</td>
<td>O</td>
<td></td>
<td>9.2.2.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;UL GTP-PDU Sequence Number</td>
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<td>9.2.2.4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>RABs Queued List</td>
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<td>ignore</td>
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<tr>
<td>&gt;RABs Queued Item IEs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>1 to</td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>RABs Failed To Setup Or Modify List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Failed To Setup Or Modify Item IEs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>1 to</td>
<td>9.2.1.2</td>
<td>The same RAB ID must only be present in one group.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RABs Failed To Release List</td>
<td>O</td>
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<td>YES</td>
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<td>ignore</td>
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<tr>
<td>&gt;RABs Failed To</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to</td>
<td>EACH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ignore</td>
</tr>
</tbody>
</table>
### 9.1.5 RAB RELEASE REQUEST

This message is sent by the RNC to request the CN to release one or more RABs for the same UE.

**Direction:** RNC → CN.

**Signalling bearer mode:** Connection oriented.

```
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs To Be Released List</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RABs To Be Released Item IEs</td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>ignore</td>
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<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
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</tbody>
</table>
```

**Range bound**

<table>
<thead>
<tr>
<th>maxnoofRABs</th>
<th>Maximum no. of RABs for one UE. Value is 256.</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofVol</td>
<td>Maximum no. of reported data volume for one RAB. Value is 2.</td>
</tr>
</tbody>
</table>

### 9.1.6 IU RELEASE REQUEST

This message is sent by the RNC to request the CN to release the Iu connection.

**Direction:** RNC → CN.

**Signalling bearer mode:** Connection oriented.

```
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
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<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs To Be Released List</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RABs To Be Released Item IEs</td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>YES</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
```

**Range bound**

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |
### 9.1.7 IU RELEASE COMMAND

This message is sent by the CN to order the RNC to release all resources related to the Iu connection.

**Direction:** CN → RNC.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
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<tbody>
<tr>
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<td>YES</td>
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</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
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</tr>
</tbody>
</table>

#### 9.1.8 IU RELEASE COMPLETE

This message is sent by the RNC as a response to the IU RELEASE COMMAND message.

**Direction:** RNC → CN.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
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<td>Message Type</td>
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<tr>
<td>RABs Data Volume Report List</td>
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<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Data Volume Report Item IEs</td>
<td>1 to</td>
<td>&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
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<td>9.2.1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB Data Volume Report List</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;RAB Data Volume Report Item IEs</td>
<td>1 to</td>
<td>&lt;maxnoofVol&gt;</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>M</td>
<td>9.2.3.12</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;Data Volume Reference</td>
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<td>RABs Released List</td>
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<td></td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Released Item IEs</td>
<td>1 to</td>
<td>&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
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<td>9.2.1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;DL GTP-PDU Sequence Number</td>
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<td>9.2.2.3</td>
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<td></td>
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<tr>
<td>&gt;&gt;UL GTP-PDU Sequence Number</td>
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<td>9.2.2.4</td>
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<td></td>
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<tr>
<td>Criticality Diagnostics</td>
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<td>9.2.1.35</td>
<td>YES</td>
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<td></td>
</tr>
</tbody>
</table>

**Range bound**
- maxnoofRABs: Maximum no. of RABs for one UE. Value is 256.
- maxnoofVol: Maximum no. of reported data volume for one RAB. Value is 2.
9.1.9  RELOCATION REQUIRED

This message is sent by the source RNC to inform the CN that a relocation is to be performed.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
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<tbody>
<tr>
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<td>Cause</td>
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<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>MS Classmark 2</td>
<td>C – ifGSMCStar get</td>
<td>9.2.1.26</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Classmark 3</td>
<td>C – ifGSMCStar get</td>
<td>9.2.1.27</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source To Target Transparent Container</td>
<td>C – ifUMTStarge t or ifEUTRAtarg et</td>
<td>9.2.1.30A</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old BSS To New BSS Information</td>
<td>O</td>
<td></td>
<td>9.2.1.29</td>
<td>Can optionally be used if GSM target but not used for UMTS target.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>GERAN Classmark</td>
<td>O</td>
<td></td>
<td>9.2.1.57</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Source BSS To Target BSS Transparent Container</td>
<td>O</td>
<td>9.2.1.79</td>
<td>Shall be included if, and only if, GSM PS domain is target.</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>SRVCC HO Indication</td>
<td>O</td>
<td></td>
<td>9.2.1.88</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>CSG id</td>
<td>O</td>
<td></td>
<td>9.2.1.85</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Cell Access Mode</td>
<td>O</td>
<td></td>
<td>9.2.1.93</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
</tbody>
</table>

**Condition**

- **ifGSMCStar get** 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.
- **ifUMTStarget** This IE shall be present if the Target ID IE contains a Target RNC-ID IE.
- **ifEUTRAtarget** This IE shall be present if the Target ID IE contains a Target eNB-ID IE or if the Target ID IE contains a Target RNC-ID IE containing a Corresponding RNC-ID.

9.1.10  RELOCATION REQUEST

This message is sent by the CN to request the target RNC to allocate necessary resources for a relocation.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Permanent NAS UE Identity</td>
<td>O</td>
<td></td>
<td>9.2.3.1</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td>YES reject</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>Source To Target Transparent Container</td>
<td>M</td>
<td></td>
<td>9.2.1.30a</td>
<td>Encoded as the Source RNC To Target RNC Transparent Container IE defined in subclause 9.2.1.28.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>RABs To Be Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>&gt;&gt;RABs To Be Setup Item IEs</td>
<td></td>
<td></td>
<td>I to &lt;maxnoofRABs&gt;</td>
<td>EACH reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;NAS Synchronisation Indicator</td>
<td>O</td>
<td></td>
<td>9.2.3.18</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;RAB Parameters</td>
<td>M</td>
<td></td>
<td>9.2.1.3</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Data Volume ReportingIndication</td>
<td>C – ifPS</td>
<td></td>
<td>9.2.1.17</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;PDP Type Information</td>
<td>C – ifPS</td>
<td></td>
<td>9.2.1.40</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;User Plane Information</td>
<td>M</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;User Plane Mode</td>
<td>M</td>
<td></td>
<td>9.2.1.18</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;UP Mode Versions</td>
<td>M</td>
<td></td>
<td>9.2.1.19</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>M</td>
<td></td>
<td>9.2.2.2</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Service Handover</td>
<td>O</td>
<td></td>
<td>9.2.1.41</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Alternative RAB Parameter Values</td>
<td>O</td>
<td></td>
<td>9.2.1.43</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;GERAN BSC Container</td>
<td>O</td>
<td></td>
<td>9.2.1.58</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;E-UTRAN Service Handover</td>
<td>O</td>
<td></td>
<td>9.2.1.90</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;PDP Type Information extension</td>
<td>O</td>
<td></td>
<td>9.2.1.40a</td>
<td>The PDP Type Information extension IE can only be included if PDP Type Information IE is present.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;Offload RAB parameters</td>
<td>O</td>
<td></td>
<td>9.2.1.94</td>
<td>Applicable only for SIPTO at Iu-PS</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Integrity Protection Information</td>
<td>O</td>
<td></td>
<td>9.2.1.11</td>
<td>Integrity Protection Information includes key and permitted algorithms.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Encryption Information</td>
<td>O</td>
<td>9.2.1.12</td>
<td>Encryption Information includes key and permitted algorithms.</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>---</td>
<td>---------</td>
<td>---------------------------------------------------------------</td>
<td>-----</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Iu Signalling Connection Identifier</td>
<td>M</td>
<td>9.2.1.38</td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td>9.2.1.46</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNA Access Information</td>
<td>O</td>
<td>9.2.3.24</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UESBI-Iu</td>
<td>O</td>
<td>9.2.1.59</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected PLMN Identity</td>
<td>O</td>
<td>9.2.3.33</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CN MBMS Linking Information</td>
<td>O</td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Joined MBMS Bearer Service IEs</td>
<td></td>
<td></td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;TMGI</td>
<td>M</td>
<td>9.2.3.37</td>
<td>The same TMGI must only be present in one group.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;PTP RAB ID</td>
<td>M</td>
<td>9.2.1.75</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>UE Aggregate Maximum Bit Rate</td>
<td>O</td>
<td>9.2.1.91</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSG id</td>
<td>O</td>
<td>9.2.1.85</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSG Membership Status</td>
<td>O</td>
<td>9.2.1.92</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSISDN</td>
<td>O</td>
<td>9.2.1.95</td>
<td>Applicable only for SIPTO at Iu-PS</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

### Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIPS</td>
<td>This IE shall be present if the CN domain indicator IE is set to &quot;PS domain&quot;.</td>
</tr>
</tbody>
</table>

### Range bound

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
<tr>
<td>maxnoofMulticastServicesPerUE</td>
<td>Maximum no. of Multicast Services that a UE can join and leave respectively. Value is 128.</td>
</tr>
</tbody>
</table>

### 9.1.11 RELOCATION REQUEST ACKNOWLEDGE

This message is sent by the target RNC to inform the CN about the result of the resource allocation for the requested relocation.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Target To Source Transparent Container</td>
<td>O</td>
<td>9.2.1.30b</td>
<td>Encoded as the Target RNC To Source RNC Transparent Container IE defined in subclause 9.2.1.30</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>RABs Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Setup Item IEs</td>
<td></td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td></td>
<td>EACH</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>O</td>
<td>9.2.2.1</td>
<td>IPv6 or IPv4 address if no other TLA included. IPv4 address if other TLA included.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Assigned RAB Parameter Values</td>
<td>O</td>
<td>9.2.1.44</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>O</td>
<td>9.2.2.1</td>
<td>IPv6 address if included.</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs Failed To Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Failed To Setup Item IEs</td>
<td></td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td></td>
<td>EACH</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Chosen Integrity Protection Algorithm</td>
<td>O</td>
<td>9.2.1.13</td>
<td>Indicates the Integrity Protection algorithm that will be used by the target RNC.</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td>9.2.1.14</td>
<td>Indicates the Encryption algorithm that will be used by the target RNC.</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>CSG Id</td>
<td>O</td>
<td>9.2.1.85</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

**Range bound**

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |
9.1.12 RELOCATION COMMAND

This message is sent by the CN to the source RNC to inform that resources for the relocation are allocated in the target RNC (in case of intra-system relocation) or in the target system (in case of inter-system relocation).

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Target To Source Transparent Container</td>
<td>O</td>
<td></td>
<td>9.2.1.30B</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>L3 Information</td>
<td>O</td>
<td></td>
<td>9.2.1.31</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs To Be Released List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs To Be Released Item IEs</td>
<td>1 to</td>
<td>&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td></td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RABs Subject To Data Forwarding List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Subject To Data Forwarding Item IEs</td>
<td>1 to</td>
<td>&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td></td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td>IPv6 or IPv4 address if no other TLA included, IPv4 address if other TLA included.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>M</td>
<td></td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>O</td>
<td></td>
<td>9.2.2.1</td>
<td>IPv6 address if included.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td></td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Inter-System Information Transparent Container</td>
<td>O</td>
<td></td>
<td>9.2.1.48</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Target BSS to Source BSS Transparent Container</td>
<td>O</td>
<td></td>
<td>9.2.1.80</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>SRVCC Information</td>
<td>O</td>
<td></td>
<td>9.2.1.89</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

**Range bound** | **Explanation**
--- | ---
maxnoofRABs | Maximum no. of RABs for one UE. Value is 256.

9.1.13 RELOCATION DETECT

This message is sent by the target RNC to inform the CN that the relocation execution trigger has been received.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

9.1.14 RELOCATION COMPLETE

This message is sent by the target RNC to inform the CN that the relocation is completed.
### 9.1.15 RELOCATION PREPARATION FAILURE

This message is sent by the CN to the source RNC if the relocation preparation failed.

**Direction:** CN → RNC.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Higher bitrates than 16 Mbps flag</td>
<td>O</td>
<td></td>
<td>9.2.3.54</td>
<td>May only be included towards the PS domain.</td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.16 RELOCATION FAILURE

This message is sent by the target RNC to inform the CN that the requested resource allocation failed.

**Direction:** RNC → CN.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Inter-System Information Transparent Container</td>
<td>O</td>
<td></td>
<td>9.2.1.48</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.17 RELOCATION CANCEL

This message is sent by the source RNC to the CN to cancel an ongoing relocation.

**Direction:** RNC → CN.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
9.1.18 RELOCATION CANCEL ACKNOWLEDGE

This message is sent by the CN to the source RNC when the relocation has been cancelled.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

9.1.19 SRNS CONTEXT REQUEST

This message is sent by the CN to the source RNC to indicate the PS RABs for which context transfer shall be performed.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RABs Subject To Data Forwarding List</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>RAT Type</td>
<td>O</td>
<td>9.2.3.52</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
</tbody>
</table>

9.1.20 SRNS CONTEXT RESPONSE

This message is sent by the source RNC as a response to SRNS CONTEXT REQUEST message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.
### 9.1.21 SRNS DATA FORWARD COMMAND

This message is sent by the CN to the RNC to trigger the transfer of N-PDUs from the RNC to the CN in intersystem change or in some further cases described in TS 23.060 [21].

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

#### IE/Group Name

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Range bound

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |

### 9.1.22 FORWARD SRNS CONTEXT

This message is sent either by the source RNC to the CN or by the CN to the target RNC to transfer the SRNS Context.

Direction: CN → RNC and RNC → CN.

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>RAB Contexts List</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RAB Contexts Item IEs</td>
<td></td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;DL GTP-PDU Sequence Number</td>
<td>O</td>
<td>9.2.2.3</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;UL GTP-PDU Sequence Number</td>
<td>O</td>
<td>9.2.2.4</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;DL N-PDU Sequence Number</td>
<td>O</td>
<td>9.2.1.33</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;UL N-PDU Sequence Number</td>
<td>O</td>
<td>9.2.1.34</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Source RNC PDCP context info</td>
<td>O</td>
<td>9.2.1.54</td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
</tbody>
</table>

**Range bound**

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |

### 9.1.23 PAGING

This message is sent by the CN to request the UTRAN to page a specific UE.

Direction: CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>Permanent NAS UE Identity</td>
<td>M</td>
<td>9.2.3.1</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary UE Identity</td>
<td>O</td>
<td>9.2.3.2</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paging Area ID</td>
<td>O</td>
<td>9.2.1.21</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paging Cause</td>
<td>O</td>
<td>9.2.3.3</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Searching Indication</td>
<td>O</td>
<td>9.2.1.22</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRX Cycle Length Coefficient</td>
<td>O</td>
<td>9.2.1.37</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSG Id List</td>
<td>0 to &lt;maxnoofCSGId&gt;</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;CSG Id</td>
<td>M</td>
<td>9.2.1.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Range bound**

| maxnoofCSGIds | Maximum no. of CSG Ids within the CSG Id List. Value is 256. |

### 9.1.24 COMMON ID

This message is sent by the CN to inform the RNC about the permanent NAS UE identity for a user. It may include additional information.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.
### IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
---
Message Type	M	9.2.1.1
Permanent NAS UE Identity	M	9.2.3.1
SNA Access Information	O	9.2.3.24
UESBI-lu	O	9.2.1.59
Selected PLMN Identity	O	9.2.3.33
Subscriber Profile ID for RAT/Frequency priority	O	9.2.1.86
SRVCC operation possible	O	9.2.1.87
CSG Membership Status	O	9.2.1.92
Management Based MDT Allowed	O	9.2.1.110

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Type</td>
<td>O</td>
<td></td>
<td>9.2.1.6</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Reference</td>
<td>M</td>
<td></td>
<td>9.2.1.8</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trigger ID</td>
<td>O</td>
<td></td>
<td>9.2.1.7</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>UE Identity</td>
<td>O</td>
<td></td>
<td>9.2.1.9</td>
<td>Mandatory for UTRAN. Optional for GERAN Iu Mode.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>OMC ID</td>
<td>O</td>
<td></td>
<td>9.2.1.10</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Propagation Parameters</td>
<td>O</td>
<td></td>
<td>9.2.1.68</td>
<td>Optional for UTRAN. Not applicable to GERAN Iu Mode.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>MDT Configuration</td>
<td>O</td>
<td></td>
<td>9.2.1.97</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Collection Entity IP Address</td>
<td>O</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.25 CN INVOKE TRACE

This message is sent by the CN to request the RNC to start a trace recording session.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Type</td>
<td>O</td>
<td></td>
<td>9.2.1.6</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Reference</td>
<td>M</td>
<td></td>
<td>9.2.1.8</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trigger ID</td>
<td>O</td>
<td></td>
<td>9.2.1.7</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>UE Identity</td>
<td>O</td>
<td></td>
<td>9.2.1.9</td>
<td>Mandatory for UTRAN. Optional for GERAN Iu Mode.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>OMC ID</td>
<td>O</td>
<td></td>
<td>9.2.1.10</td>
<td>Mandatory for GERAN Iu Mode. Not applicable to UTRAN.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Propagation Parameters</td>
<td>O</td>
<td></td>
<td>9.2.1.68</td>
<td>Optional for UTRAN. Not applicable to GERAN Iu Mode.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>MDT Configuration</td>
<td>O</td>
<td></td>
<td>9.2.1.97</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Trace Collection Entity IP Address</td>
<td>O</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.26 SECURITY MODE COMMAND

This message is sent by the CN to trigger the integrity and ciphering functions over the radio interface.

Direction: CN → RNC.
Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Integrity Protection Information</td>
<td>M</td>
<td></td>
<td>9.2.1.11</td>
<td>Integrity information includes key and permitted algorithms.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Encryption Information</td>
<td>O</td>
<td></td>
<td>9.2.1.12</td>
<td>Encryption information includes key and permitted algorithms.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Key Status</td>
<td>M</td>
<td></td>
<td>9.2.1.36</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

### 9.1.27 SECURITY MODE COMPLETE

This message is sent by the RNC as a successful response to a SECURITY MODE COMMAND message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Chosen Integrity Protection Algorithm</td>
<td>M</td>
<td></td>
<td>9.2.1.13</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td></td>
<td>9.2.1.14</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.28 SECURITY MODE REJECT

This message is sent by the RNC as an unsuccessful response to a SECURITY MODE COMMAND message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.29 LOCATION REPORTING CONTROL

This message is sent by the CN to initiate, modify or stop location reporting from the RNC to the CN.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.
### 9.1.30 LOCATION REPORT

This message is sent by the RNC to the CN with information about the UE location.

Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Request Type</td>
<td>M</td>
<td></td>
<td>9.2.1.16</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Vertical Accuracy Code</td>
<td>O</td>
<td></td>
<td>9.2.1.46a</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>O</td>
<td></td>
<td>9.2.1.46b</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Positioning Priority</td>
<td>O</td>
<td></td>
<td>9.2.1.46c</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Client Type</td>
<td>O</td>
<td></td>
<td>9.2.1.46d</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Include Velocity</td>
<td>O</td>
<td></td>
<td>9.2.1.81</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Periodic Location Info</td>
<td>O</td>
<td></td>
<td>9.2.1.82</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

9.1.31 DATA VOLUME REPORT REQUEST

This message is sent by the CN to request unsuccessfully transmitted data volumes for specific RABs.

Direction: CN \(\rightarrow\) RNC.

Signalling bearer mode: Connection oriented.
### 9.1.32 DATA VOLUME REPORT

This message is sent by the RNC and informs the CN about unsuccessfully transmitted data volumes for requested RABs.

Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RABs Data Volume Report List</td>
<td>O</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Data Volume Report Item IEs</td>
<td>1 to 1&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB Data Volume Report List</td>
<td>O</td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAB Data Volume Report Item IEs</td>
<td>1 to 1&lt;maxnoofVol&gt;</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt;Unsuccessfully Transmitted DL Data Volume</td>
<td>M</td>
<td>9.2.3.12</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt;Data Volume Reference</td>
<td>O</td>
<td>9.2.3.13</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RABs Failed To Report List</td>
<td>O</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Failed To Report Item IEs</td>
<td>1 to 1&lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
<tr>
<td>maxnoofVol</td>
<td>Maximum no. of reported data volume for one RAB. Value is 2.</td>
</tr>
</tbody>
</table>

### 9.1.33 INITIAL UE MESSAGE

This message is sent by the RNC to transfer the radio interface initial layer 3 message to the CN.

Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.
### IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality
--- | --- | --- | --- | --- | --- | ---
Message Type | M | | 9.2.1.1 | | YES | ignore
CN Domain Indicator | M | | 9.2.1.5 | | YES | ignore
LAI | M | | 9.2.3.6 | | YES | ignore
RAC | C - ifPS | | 9.2.3.7 | | YES | ignore
SAI | M | | 9.2.3.9 | | YES | ignore
NAS-PDU | M | | 9.2.3.5 | | YES | ignore
Iu Signalling Connection Identifier | M | | 9.2.1.38 | | YES | ignore
Global RNC-ID | M | | 9.2.1.39 | If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored. | YES | ignore
GERAN Classmark | O | | 9.2.1.57 | | YES | ignore
Selected PLMN Identity | O | | 9.2.3.33 | | YES | ignore
NAS Sequence Number | O | | 9.2.3.34 | | YES | ignore
Permanent NAS UE Identity | O | | 9.2.3.1 | | YES | ignore
Redirect Attempt Flag | O | | 9.2.3.50 | | YES | ignore
Extended RNC-ID | O | | 9.2.1.39a | The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095. | YES | reject
CSG Id | O | | 9.2.1.85 | | YES | reject
Cell Access Mode | O | | 9.2.1.93 | | YES | reject
L-GW Transport Layer Address | O | | Transport Layer Address 9.2.2.1 | Indicating the Transport Layer address of the L-GW if the L-GW is co-located with the RNC | YES | reject
Higher bitrates than 16 Mbps flag | O | | 9.2.3.54 | May only be included towards the PS domain. | YES | ignore

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ifPS</td>
<td>This IE shall be present if the CN Domain Indicator IE is set to “PS domain.”</td>
</tr>
</tbody>
</table>

### 9.1.34 DIRECT TRANSFER

This message is sent by both the CN and the RNC and is used for carrying NAS information over the Iu interface.

**Direction:** RNC → CN and CN → RNC.

**Signalling bearer mode:** Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>NAS-PDU</td>
<td>M</td>
<td></td>
<td>9.2.3.5</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>LAI</td>
<td>O</td>
<td></td>
<td>9.2.3.6</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>RAC</td>
<td>O</td>
<td></td>
<td>9.2.3.7</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>SAI</td>
<td>O</td>
<td></td>
<td>9.2.3.9</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>SAPI</td>
<td>O</td>
<td></td>
<td>9.2.3.8</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>Redirection Indication</td>
<td>O</td>
<td></td>
<td>9.2.3.36</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>Redirection Completed</td>
<td>O</td>
<td></td>
<td>9.2.3.35</td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>Subscriber Profile ID for RAT/Frequency.priority</td>
<td>O</td>
<td></td>
<td>9.2.1.86</td>
<td>Indicating the Transport Layer address of the L-GW if the L-GW is co-located with RNC. It can only be transmitted from the RNC to the CN.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>L-GW Transport Layer Address</td>
<td>O</td>
<td></td>
<td>Transport Layer Address 9.2.2.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.1.35  CN INFORMATION BROADCAST REQUEST
Void.

9.1.36  CN INFORMATION BROADCAST CONFIRM
Void.

9.1.37  CN INFORMATION BROADCAST REJECT
Void.

9.1.38  OVERLOAD
This message is sent by either the CN or the RNC to indicate that the control plane of the node is overloaded.

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.
### 9.1.39 RESET

This message is sent by both the CN and the RNC and is used to request that the other node be reset.

**Direction:** RNC → CN and CN → RNC.

**Signalling bearer mode:** Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39</td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Priority Class Indicator</td>
<td>O</td>
<td></td>
<td>9.2.1.109</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
9.1.40 RESET ACKNOWLEDGE

This message is sent by both the CN and the RNC as a response to a RESET message.

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td>9.2.1.39</td>
<td></td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td>9.2.1.46</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td>9.2.1.39a</td>
<td></td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

9.1.41 ERROR INDICATION

This message is sent by both the CN and the RNC and is used to indicate that some error has been detected in the node.

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connection oriented or connectionless.
### 9.1.42 CN DEACTIVATE TRACE

This message is sent by the CN to request the RNC to stop a trace session for the indicated trace reference.

Direction: CN → RNC.

Signalling bearer mode: Connection Oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Cause</td>
<td>O</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>O</td>
<td></td>
<td>9.2.1.5</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39</td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

### 9.1.43 RANAP RELOCATION INFORMATION

This message is part of a special RANAP Relocation Information procedure, and is sent between RNCs during Relocation.

Direction: RNC - RNC.

Signalling bearer mode: Not applicable.
### IE/Group Name | Message Type | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |  
--- | --- | --- | --- | --- | --- | --- | --- |  
Direct Transfer Information List | M | 9.2.1.1 | YES | ignore |  
Direct Transfer Information Item IEs | M | 9.2.3.5 | YES | - |  
>NAS-PDU | M | 9.2.3.8 | YES | - |  
>CN Domain Indicator | M | 9.2.1.5 | YES | - |  
RAB Contexts List | O | 9.2.1.2 | EACH | ignore |  
>RAB Contexts Item IEs | 1 to <maxnoofRABs> | EACH | ignore |  
>RAB ID | M | 9.2.1.2 | - | - |  
>DL GTP-PDU Sequence Number | O | 9.2.2.3 | - | - |  
>UL GTP-PDU Sequence Number | O | 9.2.2.4 | - | - |  
>DL N-PDU Sequence Number | O | 9.2.1.33 | - | - |  
>UL N-PDU Sequence Number | O | 9.2.1.34 | - | - |  
Source RNC PDCP context info | O | 9.2.1.54 | YES | Ignore |  
RNSAP Relocation parameters | O | 9.2.1.101 | Applicable only to RNSAP relocation | YES | reject |  

| Range bound | Explanation |  
--- | --- |  
maxnoofDT | Maximum no. of DT information. Value is 15. |  
maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |  

### 9.1.44 RESET RESOURCE

This message is sent by either the CN or the RNC. The sending entity informs the receiving entity that it requests the receiving entity to release resources and references associated to the Iu signalling connection identifiers of the message.

**Direction:** RNC → CN and CN → RNC.

**Signalling bearer mode:** Connectionless.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Reset Resource List</td>
<td>M</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;Reset Resource Item IEs</td>
<td></td>
<td></td>
<td>1 to &lt;maxnoofIuSigConIds&gt;</td>
<td>EACH</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Signalling Connection Identifier</td>
<td>M</td>
<td></td>
<td>9.2.1.38</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39</td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofIuSigConIds</td>
<td>Maximum no. of Iu signalling connection identifiers. Value is 250.</td>
</tr>
</tbody>
</table>

The maximum number of Iu signalling connection identifiers contained in the RESET RESOURCE message shall not exceed the range bound specified for the maxnoofIuSigConIds (max. no. of Iu signalling connection identifiers) as indicated in the table above.
9.1.45 RESET RESOURCE ACKNOWLEDGE

This message is sent by either the CN or the RNC to inform the RNC or the CN that the RESET RESOURCE message has been received.

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Reset Resource List</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Reset Resource Item IEs</td>
<td></td>
<td></td>
<td>1 to &lt;maxnoofIuSigCo nIds&gt;</td>
<td>This list shall be in the same order as the list received in the RESET RESOURCE message.</td>
<td>EACH</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;&gt;Iu Signalling Connection Identifier</td>
<td></td>
<td>9.2.1.38</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td>9.2.1.39</td>
<td></td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td>9.2.1.46</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td>9.2.1.39a</td>
<td></td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofIuSigConnIds</td>
<td>Maximum no. of Iu signalling connection identifiers. Value is 250.</td>
</tr>
</tbody>
</table>

9.1.46 RAB MODIFY REQUEST

This message is sent by the RNC to the CN to request modification of one or more RABs for the same UE.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.
9.1.47 LOCATION RELATED DATA REQUEST

This message is sent by the CN either to initiate delivery of dedicated assistance data from the RNC to the UE, or to retrieve deciphering keys for the broadcast assistance data.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs To Be Modified List</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs To Be Modified Item IEs</td>
<td></td>
<td>1 to</td>
<td>9.2.1.2</td>
<td>Uniquely identifies the RAB for a specific CN domain, for a particular UE.</td>
<td>EACH</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Requested RAB Parameter Values</td>
<td>M</td>
<td></td>
<td>9.2.1.45</td>
<td>Includes RAB parameters for which different values than what was originally negotiated are being requested.</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Range bound | Explanation
maxnoofRABs | Maximum no. of RABs for one UE. Value is 256.

9.1.48 LOCATION RELATED DATA RESPONSE

This message is sent by the RNC as a successful response to a LOCATION RELATED DATA REQUEST message.
Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

### 9.1.49 LOCATION RELATED DATA FAILURE

This message is sent by the RNC to report an unsuccessful response to a LOCATION RELATED DATA REQUEST message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Broadcast Assistance Data Deciphering Keys</td>
<td>O</td>
<td></td>
<td>9.2.3.20</td>
<td>Deciphering keys for UE based OTDOA or Assisted GPS</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Broadcast GANSS Assistance Data Deciphering Keys</td>
<td>O</td>
<td></td>
<td>9.2.3.20</td>
<td>Deciphering keys for Assisted GANSS</td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.50 INFORMATION TRANSFER INDICATION

This message is sent by the CN to transfer information to an RNC.

Direction: CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Information Transfer ID</td>
<td>M</td>
<td></td>
<td>9.2.1.55</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Provided Data</td>
<td>M</td>
<td></td>
<td>9.2.1.56</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.51 INFORMATION TRANSFER CONFIRMATION

This message is sent by the RNC as a successful response to an INFORMATION TRANSFER INDICATION message.

Direction: RNC → CN.

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 Transfer ID | M | | 9.2.1.55 | YES ignore
CN Domain Indicator | M | | 9.2.1.5 | YES ignore
Criticality Diagnostics | O | | 9.2.1.35 | YES ignore
Global RNC-ID | M | | 9.2.1.39 | If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored. | YES ignore
Extended RNC-ID | O | | 9.2.1.39a | The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095. | YES reject

### 9.1.52 INFORMATION TRANSFER FAILURE

This message is sent by the RNC as an unsuccessful response to an INFORMATION TRANSFER INDICATION message.

Direction: RNC $\rightarrow$ CN.

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 Transfer ID | M | | 9.2.1.55 | YES ignore
CN Domain Indicator | M | | 9.2.1.5 | YES ignore
Cause | M | | 9.2.1.4 | YES ignore
Criticality Diagnostics | O | | 9.2.1.35 | YES ignore
Global RNC-ID | M | | 9.2.1.39 | If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored. | YES ignore
Extended RNC-ID | O | | 9.2.1.39a | The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095. | YES reject

### 9.1.53 UE SPECIFIC INFORMATION INDICATION

This message is sent by the CN to inform the RNC about information related to this connection.
Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>UESBI-Iu</td>
<td>O</td>
<td></td>
<td>9.2.1.59</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.54 DIRECT INFORMATION TRANSFER

This message is sent by both the RNC and the CN in order to transfer specific information.

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Inter-system Information Transfer Type</td>
<td>O</td>
<td></td>
<td>9.2.1.62</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39</td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Extended RNC-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

### 9.1.55 UPLINK INFORMATION EXCHANGE REQUEST

This message is sent by the RNC to the CN in order to transfer or request specific information. The nature of the exchange i.e. transfer or request of specific information is indicated within the Information Exchange Type IE. The nature of the information to be transferred is indicated within the Information Transfer Type IE. The nature of the information requested is indicated within the Information Request Type IE.

Direction: RNC → CN.

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 | reject
Information Exchange Type | M | 9.2.1.72 | YES | reject
Information Transfer Type | C – iftransfer | 9.2.1.63 | YES | reject
Information Request Type | C – ifrequest | 9.2.1.73 | YES | reject
CN Domain Indicator | M | 9.2.1.5 | YES | reject
Global RNC-ID | M | 9.2.1.39 | If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored. | YES | reject
Extended RNC-ID | O | 9.2.1.39a | The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095. | YES | reject

### Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iftransfer</td>
<td>This IE shall be present if the Information Exchange Type IE is set to &quot;transfer&quot;.</td>
</tr>
<tr>
<td>Ifrequest</td>
<td>This IE shall be present if the Information Exchange Type IE is set to &quot;request&quot;.</td>
</tr>
</tbody>
</table>

#### 9.1.56 UPLINK INFORMATION EXCHANGE RESPONSE

This message is sent by the CN to the RNC as a successful response to the UPLINK INFORMATION EXCHANGE REQUEST message.

Direction: CN → RNC.

Signalling bearer mode: Connectionless.

### IE/Group Name

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Information Exchange ID</td>
<td>M</td>
<td>9.2.1.71</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Information Requested</td>
<td>O</td>
<td>9.2.1.74</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

#### 9.1.57 UPLINK INFORMATION EXCHANGE FAILURE

This message is sent by the CN to the RNC as an unsuccessful response to the UPLINK INFORMATION EXCHANGE REQUEST message.
Direction: CN → RNC.

Signalling bearer mode: Connectionless.

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

### 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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>TMGI</td>
<td>M</td>
<td></td>
<td>9.2.3.37</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>MBMS Session Identity</td>
<td>O</td>
<td></td>
<td>9.2.3.38</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>MBMS Bearer Service Type</td>
<td>M</td>
<td></td>
<td>9.2.3.39</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Iu Signalling Connection Identifier</td>
<td>M</td>
<td></td>
<td>9.2.1.38</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>RAB parameters</td>
<td>M</td>
<td></td>
<td>9.2.1.3</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>PDP Type Information</td>
<td>O</td>
<td></td>
<td>9.2.1.40</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>MBMS Session Duration</td>
<td>M</td>
<td></td>
<td>9.2.3.40</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>MBMS Service Area</td>
<td>M</td>
<td></td>
<td>9.2.3.41</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Frequency Layer Convergence Flag</td>
<td>O</td>
<td></td>
<td>9.2.1.76</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>RA List of Idle Mode UEs</td>
<td>O</td>
<td></td>
<td>9.2.3.42</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID IE</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>MBMS Session Repetition Number</td>
<td>O</td>
<td></td>
<td>9.2.3.48</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Time to MBMS Data Transfer</td>
<td>M</td>
<td></td>
<td>9.2.3.49</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>MBMS Counting Information</td>
<td>O</td>
<td></td>
<td>9.2.3.39a</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td><strong>MBMS Synchronisation Information</strong></td>
<td>O</td>
<td></td>
<td>9.2.1.84</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;MBMS HC Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.84</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;IP Multicast Address</td>
<td>M</td>
<td></td>
<td>OCTET STRING (4..16)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;GTP DL TEID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (4)</td>
<td>For details and range, see TS 29.281 [59]</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;IP Source Address</td>
<td>O</td>
<td></td>
<td>OCTET STRING (4..16)</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>PDP Type Information extension</td>
<td>O</td>
<td></td>
<td>9.2.1.40 a</td>
<td>The <strong>PDP Type Information extension</strong> IE can only be included if <strong>PDP Type Information</strong> IE is not present.</td>
<td>YES</td>
<td>Ignore</td>
</tr>
</tbody>
</table>

### 9.1.59 MBMS SESSION START RESPONSE

This message is sent by the RNC to report the successful outcome of the request from the MBMS SESSION START message.
Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Transport Layer Information</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Iu Transport Association</td>
<td>O</td>
<td></td>
<td>9.2.2.2</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Cause</td>
<td>O</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.60 MBMS SESSION START FAILURE

This message is sent by the RNC to report the unsuccessful outcome of the request from the MBMS SESSION START message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.61 MBMS SESSION UPDATE

This message is sent by the CN to inform the RNC whenever the RA List of Idle Mode UEs changes compared to one previously sent.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Session Update ID</td>
<td>M</td>
<td></td>
<td>9.2.1.77</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Delta RA List of Idle Mode UEs</td>
<td>M</td>
<td></td>
<td>9.2.3.43</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

### 9.1.62 MBMS SESSION UPDATE RESPONSE

This message is sent by the RNC to report the successful outcome of the request from the MBMS SESSION UPDATE message.
Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Session Update ID</td>
<td>M</td>
<td></td>
<td>9.2.1.77</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Transport Layer Information</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Iu Transport Association</td>
<td>M</td>
<td></td>
<td>9.2.2.2</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Cause</td>
<td>O</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.63 MBMS SESSION UPDATE FAILURE

This message is sent by the RNC to report the unsuccessful outcome of the request from the MBMS SESSION UPDATE message.

Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Session Update ID</td>
<td>M</td>
<td></td>
<td>9.2.1.77</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.64 MBMS SESSION STOP

This message is sent by the CN to release a MBMS Iu signalling connection and its associated MBMS RAB.

Direction: CN \(\rightarrow\) RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>MBMS CN De-Registration</td>
<td>M</td>
<td></td>
<td>9.2.3.44</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

### 9.1.65 MBMS SESSION STOP RESPONSE

This message is sent by the RNC to report the outcome of the request from the MBMS SESSION STOP message.

Direction: RNC \(\rightarrow\) CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>O</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
9.1.66 MBMS UE LINKING REQUEST

This message is sent by the CN to make the RNC aware that a given UE, with existing Iu-ps signalling connection, joined/left one or several Multicast Services.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joined MBMS Bearer Services List</td>
<td>O</td>
<td>9.2.1.1</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Joined MBMS Bearer Service IEs</td>
<td>EACH</td>
<td>9.2.3.37</td>
<td>The same TMGI must only be present in one group.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;TMGI</td>
<td>M</td>
<td>9.2.3.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;PTP RAB ID</td>
<td>M</td>
<td>9.2.1.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left MBMS Bearer Services List</td>
<td>O</td>
<td>9.2.1.75</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Left MBMS Bearer Service IEs</td>
<td>EACH</td>
<td>9.2.3.37</td>
<td>The same TMGI must only be present in one group.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;TMGI</td>
<td>M</td>
<td>9.2.3.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Range bound | Explanation
maxnoofMulticastServicesPerUE | Maximum no. of Multicast Services that a UE can join and leave respectively. Value is 128.

9.1.67 MBMS UE LINKING RESPONSE

This message is sent by the RNC to report the outcome of the request from the MBMS UE LINKING REQUEST message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuccessful Linking List</td>
<td>O</td>
<td>9.2.1.1</td>
<td>YES ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Unsuccessful Linking IEs</td>
<td>EACH</td>
<td>9.2.3.37</td>
<td>The same TMGI must only be present in one group.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;TMGI</td>
<td>M</td>
<td>9.2.3.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td>YES ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.1.68  MBMS REGISTRATION REQUEST

This message is sent by the RNC to request the CN to register or de-register the RNC for a certain Multicast Service.

Direction: RNC → CN.

Signalling bearer mode: Connectionless or connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>YES</td>
<td>9.2.1.1</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>MBMS Registration Request Type</td>
<td>M</td>
<td>YES</td>
<td>9.2.3.45</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>TMGI</td>
<td>M</td>
<td>YES</td>
<td>9.2.3.37</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>IP Multicast Address</td>
<td>C-ifRegister</td>
<td>OCTET</td>
<td>STRING</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>APN</td>
<td>O-ifRegister</td>
<td>OCTET</td>
<td>STRING</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Global RNC-ID</td>
<td>O</td>
<td>YES</td>
<td>9.2.1.39</td>
<td>If the Extended RNC-ID IE is included in the message, the RNC-ID IE in the Global RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>YES</td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfRegister</td>
<td>This IE shall be present if the MBMS Registration Request Type IE is set to &quot;register&quot;.</td>
</tr>
</tbody>
</table>

9.1.69  MBMS REGISTRATION RESPONSE

This message is sent by the CN to the RNC as a successful response to the MBMS REGISTRATION REQUEST message.

Direction: CN → RNC.

Signalling bearer mode: Connectionless or connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>TMGI</td>
<td>O</td>
<td></td>
<td>9.2.3.37</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

### 9.1.70 MBMS REGISTRATION FAILURE

This message is sent by the CN to the RNC as an unsuccessful response to the MBMS REGISTRATION REQUEST message.

Direction: CN → RNC.

Signalling bearer mode: Connectionless or connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>TMGI</td>
<td>O</td>
<td></td>
<td>9.2.3.37</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

### 9.1.71 MBMS CN DE-REGISTRATION REQUEST

This message is sent by the CN to make the RNC aware that a certain Multicast Service is no longer available.

Direction: CN → RNC.

Signalling bearer mode: Connectionless.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>TMGI</td>
<td>M</td>
<td></td>
<td>9.2.3.37</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Global CN-ID</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
</tbody>
</table>

### 9.1.72 MBMS CN DE-REGISTRATION RESPONSE

This message is sent by the RNC to the CN as a response to the MBMS CN DE-REGISTRATION REQUEST message.

Direction: RNC → CN.

Signalling bearer mode: Connectionless.
### 9.1.73 MBMS RAB ESTABLISHMENT INDICATION

This message is sent by the RNC to the CN to inform the CN of the establishment of the MBMS RAB corresponding to the MBMS Iu signalling connection used by this message.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Transport Layer Information</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Iu Transport Association</td>
<td>M</td>
<td></td>
<td>9.2.2.2</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

### 9.1.74 MBMS RAB RELEASE REQUEST

This message is sent by the RNC to request the CN to release the MBMS RAB.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
9.1.75 MBMS RAB RELEASE

This message is sent by the CN to order the RNC to release all MBMS resources related to the Iu connection.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

9.1.76 MBMS RAB RELEASE FAILURE

This message is sent by the CN to the RNC as an unsuccessful response to the MBMS RAB RELEASE REQUEST message.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Cause</td>
<td>M</td>
<td></td>
<td>9.2.1.4</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

9.1.77 ENHANCED RELOCATION COMPLETE REQUEST

This message is sent by the RNC to inform the CN that an enhanced relocation is completed.

Direction: RNC → CN

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Old Iu Signalling Connection Identifier</td>
<td>M</td>
<td></td>
<td>Iu Signalling Connection Identifier 9.2.1.38</td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Iu Signalling Connection Identifier</td>
<td>M</td>
<td>9.2.1.38</td>
<td></td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Relocation Source RNC-ID</td>
<td>M</td>
<td>Global RNC-ID 9.2.1.39</td>
<td>If the Relocation Source Extended RNC-ID IE is included in the message, the Global RNC-ID IE in the Relocation Source RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Relocation Source Extended RNC-ID</td>
<td>O</td>
<td>Extended RNC Id 9.2.1.39a</td>
<td>The Relocation Source Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Relocation Target RNC-ID</td>
<td>M</td>
<td>Global RNC-ID 9.2.1.39</td>
<td>If the Relocation Target Extended RNC-ID IE is included in the message, the RNC-ID IE in the Target RNC-ID IE shall be ignored.</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>Relocation Target Extended RNC-ID</td>
<td>O</td>
<td>9.2.1.39a</td>
<td>The Relocation Target Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>RABs Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td>YES reject</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>&gt;RABs Setup item IEs</td>
<td></td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td>EACH reject</td>
<td>Each RAB setup item is rejected.</td>
<td></td>
<td>rejects</td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>O</td>
<td>9.2.2.1</td>
<td>IPv6 or IPv4 address.</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Assigned RAB Parameter Values</td>
<td>O</td>
<td>9.2.1.44</td>
<td></td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Chosen Integrity Protection Algorithm</td>
<td>O</td>
<td>9.2.1.13</td>
<td>Indicates the Integrity</td>
<td>YES ignore</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
<td>Criticality</td>
<td>Assigned Criticality</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>------------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td></td>
<td>9.2.1.14</td>
<td>Indicates the Encryption algorithm that will be used by the target RNC.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Higher bitrates than 16 Mbps flag</td>
<td>O</td>
<td></td>
<td>9.2.3.54</td>
<td>May only be included towards the PS domain.</td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnooRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
</tbody>
</table>

### 9.1.78 ENHANCED RELOCATION COMPLETE RESPONSE

This message is sent by the CN to inform the RNC that an enhanced relocation is completed in CN.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RABs Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Setup Item IEs</td>
<td></td>
<td></td>
<td>1 to &lt;&lt;maxnoofRABs&gt;&gt;</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB Parameters</td>
<td>O</td>
<td>9.2.1.3</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;User Plane Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;User Plane Mode</td>
<td>M</td>
<td>9.2.1.18</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;UP Mode Versions</td>
<td>M</td>
<td>9.2.1.19</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>O</td>
<td>9.2.2.1</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>O</td>
<td>9.2.2.2</td>
<td>Related to TLA above.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Offload RAB parameters</td>
<td>O</td>
<td>9.2.1.94</td>
<td>Applicable only for SIPTO at Iu-PS</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>RABs To Be Released List</td>
<td>O</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;RABs To Be Released Item</td>
<td></td>
<td></td>
<td>1 to &lt;&lt;maxnoofRABs&gt;&gt;</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UE Aggregate Maximum Bit Rate</td>
<td>O</td>
<td>9.2.1.91</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSISDN</td>
<td>O</td>
<td>9.2.1.95</td>
<td>Applicable only for SIPTO at Iu-PS</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
</tbody>
</table>

### Range bound

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |

### 9.1.79 ENHANCED RELOCATION COMPLETE FAILURE

This message is sent by the CN to inform the RNC that a failure has occurred in the CN during the enhanced relocation procedure.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

### 9.1.80 ENHANCED RELOCATION COMPLETE CONFIRM

This message is sent by the RNC to inform the CN that an enhanced relocation is completed.

Direction: RNC → CN

Signalling bearer mode: Connection oriented.
### Table: IE/Group Name and Presence

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>RABs Failed To Initialise List</td>
<td>O</td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Failed To Initialise Item IEs</td>
<td></td>
<td>1 to &lt;maxnoofRABs&gt;</td>
<td>EACH</td>
<td>range bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Explanation: Range bound

| maxnoofRABs | Maximum no. of RABs for one UE. Value is 256. |

### 9.1.81 RANAP ENHANCED RELOCATION INFORMATION REQUEST

This message is part of a special RANAP Enhanced Relocation Information procedure, and is sent between RNCs during enhanced relocation.

Direction: RNC → RNC.

Signalling bearer mode: Not applicable.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Source RNC To Target RNC Transparent Container</td>
<td>M</td>
<td></td>
<td>9.2.1.28</td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Old Iu Signalling Connection Identifier CS domain</td>
<td>O</td>
<td></td>
<td>9.2.1.38</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID CS domain</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>Old Iu Signalling Connection Identifier PS domain</td>
<td>O</td>
<td></td>
<td>9.2.1.38</td>
<td>YES</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Global CN-ID PS domain</td>
<td>O</td>
<td></td>
<td>9.2.1.46</td>
<td>YES</td>
<td></td>
<td>reject</td>
</tr>
<tr>
<td>RABs To Be Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>reject</td>
</tr>
</tbody>
</table>

> RABs To Be Setup Item IEs

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>9.2.1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB Parameters</td>
<td>M</td>
<td></td>
<td>9.2.1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Data Volume Reporting Indication</td>
<td>C – ifPS</td>
<td></td>
<td>9.2.1.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;PDP Type Information</td>
<td>C – ifPS</td>
<td></td>
<td>9.2.1.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

> User Plane Information

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;User Plane Mode</td>
<td>M</td>
<td></td>
<td>9.2.1.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;UP Mode Versions</td>
<td>M</td>
<td></td>
<td>9.2.1.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

> Data Forwarding TNL Information

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Association</td>
<td>M</td>
<td>Iu Transport Association 9.2.2.2</td>
<td>Related to TLA above.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

>>Source Side Iu UL TNL Information

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;Transport Layer Address</td>
<td>M</td>
<td></td>
<td>9.2.2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Iu Transport Association</td>
<td>M</td>
<td></td>
<td>9.2.2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Service Handover</td>
<td>O</td>
<td></td>
<td>9.2.1.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Alternative RAB Parameter Values</td>
<td>O</td>
<td></td>
<td>9.2.1.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;E-UTRAN Service Handover</td>
<td>O</td>
<td></td>
<td>9.2.1.90</td>
<td>YES</td>
<td>Ignore</td>
</tr>
<tr>
<td>&gt;&gt;PDP Type Information extension</td>
<td>O</td>
<td></td>
<td>9.2.1.40a</td>
<td>The PDP Type Information extension IE can only be included if PDP Type Information IE is present.</td>
<td>YES</td>
</tr>
</tbody>
</table>

SNA Access Information O 9.2.3.24 YES ignore
UESBI-Iu O 9.2.1.59 YES ignore
Selected PLMN Identity O 9.2.3.33 YES ignore
CN MBMS Linking Information O YES ignore

> Joined MBMS Bearer Service IEs

<table>
<thead>
<tr>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;&gt;TMGI</td>
<td>M</td>
<td></td>
<td>9.2.3.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;PTP RAB ID</td>
<td>M</td>
<td></td>
<td>9.2.1.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Integrity Protection Information O 9.2.1.11 Integrity Protection Information includes key YES Ignore
<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfPS</td>
<td>This IE shall be present if the <code>CN domain indicator</code> IE is set to &quot;PS domain&quot;.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
<tr>
<td>maxnoofMulticastServicesPerUE</td>
<td>Maximum no. of Multicast Services that a UE can join and leave respectively. Value is 128.</td>
</tr>
</tbody>
</table>

### 9.1.82 RANAP ENHANCED RELOCATION INFORMATION RESPONSE

This message is the response message of a special RANAP Enhanced Relocation Information procedure, and is sent between RNCs during enhanced relocation.

Direction: RNC → RNC.

Signalling bearer mode: Not applicable.
### 9.1.83 SRVCC CS KEYS REQUEST

This message is sent by the source RNC to the source SGSN to request security information for SRVCC operation.

**Direction:** RNC \(\rightarrow\) SGSN.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Target RNC To Source RNC Transparent Container</td>
<td>O</td>
<td>9.2.1.30</td>
<td></td>
<td>YES</td>
<td></td>
<td>ignore</td>
</tr>
<tr>
<td>RABs Setup List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;RABs Setup Item IEs</td>
<td></td>
<td>1 to &lt;maxnofRABs&gt;</td>
<td></td>
<td>EACH</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Data Forwarding Information</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;DL Forwarding Transport Layer Address</td>
<td>M</td>
<td></td>
<td>Transport Layer Address 9.2.2.1</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;DL Forwarding Transport Association</td>
<td>M</td>
<td></td>
<td>Iu Transport Association 9.2.2.2</td>
<td>Related to TLA above.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Assigned RAB Parameter Values</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.44</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>RABs Failed To Setup List</td>
<td>O</td>
<td>YES</td>
<td></td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RABs Failed To Setup Item IEs</td>
<td></td>
<td>1 to &lt;maxnofRABs&gt;</td>
<td></td>
<td>EACH</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cause</td>
<td>M</td>
<td>9.2.1.4</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td></td>
<td>ignore</td>
</tr>
</tbody>
</table>

**Range bound**

| maxnofRABs | Maximum no. of RABs for one UE. Value is 256. |

### 9.1.84 SRVCC CS KEYS RESPONSE

This message is sent by the source SGSN to the source RNC. It contains information necessary for SRVCC operation.

**Direction:** SGSN \(\rightarrow\) RNC.

**Signalling bearer mode:** Connection oriented.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td>9.2.1.1</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Integrity Protection Key</td>
<td>M</td>
<td></td>
<td>BIT STRING (128)</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Encryption Key</td>
<td>M</td>
<td></td>
<td>BIT STRING (128)</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>SRVCC Information</td>
<td>M</td>
<td></td>
<td>9.2.1.89</td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td>O</td>
<td></td>
<td>9.2.1.35</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
9.2 Information Element Definitions

9.2.0 General

Subclause 9.2 presents the RANAP IE definitions in tabular format. The corresponding ASN.1 definition is presented in subclause 9.3. In case there is contradiction between the tabular format in subclause 9.2 and the ASN.1 definition, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional elements, where the tabular format shall take precedence.

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

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

9.2.1 Radio Network Layer Related IEs

9.2.1.1 Message Type

The Message Type IE uniquely identifies the message being sent. It is mandatory for all messages.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>
9.2.1.2 RAB ID

This element uniquely identifies a radio access bearer for a specific CN domain for a particular UE, which makes the RAB ID unique over one Iu connection. The RAB ID shall remain the same for the duration of the RAB even when the RAB is relocated to another Iu connection.

The purpose of the element is to bind data stream from the Non Access Stratum point of view (e.g. bearer of call or PDP context) and radio access bearer in Access Stratum. The value is also used in the RNC to relate Radio Bearers to a RAB. The content of this information element is transferred unchanged from the CN node (i.e. MSC or SGSN) via the RNC to the UE by RANAP messages and RRC messages. For RRC messages refer to TS 25.331 [10].

The element contains binary representation of either the Stream Identifier (SI) for CS domain or the Network Service Access Point Identifier (NSAPI) for PS domain. These identifiers are coded in the RAB ID element in accordance with the coding of the Stream Identifier IE and with the coding of the NSAPI IE in TS 24.008 [8].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB ID</td>
<td>M</td>
<td>8</td>
<td>BIT STRING (8)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.3 RAB Parameters

The purpose of the RAB parameters IE group and other parameters within the RAB parameters IE group is to indicate all RAB attributes as defined in TS 23.107 [7] for both directions.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Traffic Class</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>Desc.: This IE indicates the type of application for which the Radio Access Bearer</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(conversational,</td>
<td>service is optimised</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>streaming, interactive, background, ...)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RAB Asymmetry</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>Desc.: This IE indicates asymmetry or symmetry of the RAB and traffic direction</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Indicator</td>
<td></td>
<td></td>
<td>(Symmetric bidirectional, Asymmetric Unidirectional downlink, Asymmetric Unidirectional Uplink, Asymmetric Bidirectional, ...)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Maximum Bit Rate</td>
<td>M</td>
<td></td>
<td>1 to &lt;nbr-Separate TrafficDirections&gt; INTEGER (1..16,000,000)</td>
<td>Desc.: This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The unit is: bit/s This IE shall be ignored if Supported Maximum Bite Rate IE is present. Usage: When nbr-SeparateTrafficDirections is equal to 2, then Maximum Bit Rate attribute for downlink is signalled first, then Maximum Bit Rate attribute for uplink</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
<td>Criticality</td>
<td>Assigned Criticality</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>&gt;Guaranteed Bit Rate</td>
<td>C-trafficConv-Stream</td>
<td>1 to &lt;nbr- Separate TrafficDirections&gt;</td>
<td>INTEGER (0..16,000,000)</td>
<td>Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s. This IE shall be ignored if Supported Guaranteed Bit Rate IE is present. Usage: 1. When nbr-SeparateTrafficDirections is equal to 2, then Guaranteed Bit Rate for downlink is signalled first, then Guaranteed Bit Rate for uplink. 2. Delay and reliability attributes only apply up to the guaranteed bit rate. 3. Conditional value for the case of Support Mode for pre-defined SDU sizes: Set to highest not rate controllable bitrate, where bitrate is either – one of the RAB subflow combination bitrate IEs (when present) or – one of the calculated values given when dividing the compound Subflow combination SDU sizes by the value of the IE Maximum SDU Size and then multiplying this result by the value of the IE Maximum Bit Rate.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;Delivery Order</td>
<td>M</td>
<td></td>
<td>ENUMERATED (delivery order requested, delivery order not requested)</td>
<td>Desc: This IE indicates whether the RAB shall provide in-sequence SDU delivery or not. Usage: Delivery order requested: in sequence delivery shall be guaranteed by UTRAN on all RAB SDUs. Delivery order not requested: in sequence delivery is not required from UTRAN.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
<td>Criticality</td>
<td>Assigned Criticality</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>RAB parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Maximum SDU Size</td>
<td>M</td>
<td></td>
<td>INTEGER (0..32768)</td>
<td>Desc.: This IE indicates the maximum allowed SDU size. The unit is: bit. Usage: Conditional value: Set to largest RAB Subflow Combination compound SDU size (when present) among the different RAB Subflow Combinations</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;SDU parameters</td>
<td></td>
<td></td>
<td></td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Transfer Delay</td>
<td>C-iftrafficConv-Stream</td>
<td></td>
<td>INTEGER (0..65535)</td>
<td>Desc.: This IE indicates the maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a RAB, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP. The unit is: millisecond. Usage:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;Traffic Handling Priority</td>
<td>C-iftrafficInteractive</td>
<td></td>
<td>INTEGER (spare (0), highest (1), ... lowest (14), no priority (15)) (0..15)</td>
<td>Desc.: This IE specifies the relative importance for handling of all SDUs belonging to the radio access bearer compared to the SDUs of other bearers Usage: Values between 1 and 14 are ordered in decreasing order of priority, ‘1’ being the highest and ‘14’ the lowest. Value 0 shall be treated as a logical error if received.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
<td>Criticality</td>
<td>Assigned Criticality</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>&gt;Allocation/Retention priority</td>
<td>C</td>
<td>ENUMERATED (speech, unknown, ...)</td>
<td>This IE specifies the relative importance compared to other Radio access bearers for allocation and retention of the Radio access bearer. Usage: If this IE is not received, the request is regarded as it cannot trigger the pre-emption process and it is vulnerable to the pre-emption process.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Source Statistics Descriptor</td>
<td>C</td>
<td>ENUMERATED (speech, unknown, ...)</td>
<td>This IE specifies characteristics of the source of submitted SDUs Usage: -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Relocation Requirement</td>
<td>C</td>
<td>ENUMERATED (lossless, none, ..., realtime)</td>
<td>This IE shall be present for RABs towards the PS domain, otherwise it shall not be present. Desc.: This IE is no longer used. Usage: It shall always be set to &quot;none&quot; when sent and it shall always be ignored when received. Note: If the IE is not received, the procedure should continue based on the other IEs/IE Groups.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Signalling Indication</td>
<td>C</td>
<td>ENUMERATED (signalling, ...)</td>
<td>This IE indicates the signalling nature of the submitted SDUs. Usage: YES ignore</td>
<td>YES</td>
<td>ignore</td>
<td></td>
</tr>
<tr>
<td>&gt;Extended Maximum Bit Rate</td>
<td>C</td>
<td>INTEGER (16,000,001, 256,000)</td>
<td>This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The unit is: bit/s Usage: When nbr-SeparateTrafficDirections is equal to 2, then Maximum Bit Rate attribute for downlink is signalled first, then Maximum Bit Rate attribute for uplink</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
<td>Criticality</td>
<td>Assigned Criticality</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>RAB parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Extended Guaranteed Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>INTEGER (16,000,001,256,000,000)</td>
<td>Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;Supported Maximum Bit Rate</td>
<td>0 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000,000,000, ...)</td>
<td>Desc.: This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The unit is: bit/s</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
<tr>
<td>&gt;Supported Guaranteed Bit Rate</td>
<td>0 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000,000,000, ...)</td>
<td>Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s</td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
</tbody>
</table>
### Range Bound

<table>
<thead>
<tr>
<th><strong>nbr-SeparateTrafficDirections</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Traffic Directions being signalled separately. Set to 2 if RAB asymmetry indicator is asymmetric bidirectional. Set to 1 in all other cases.</td>
<td></td>
</tr>
</tbody>
</table>

### Range Bound

<table>
<thead>
<tr>
<th><strong>maxRABSubflows</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of Subflows per RAB. Value is 7</td>
<td></td>
</tr>
</tbody>
</table>

### Condition

<table>
<thead>
<tr>
<th><strong>trafficConv-Stream</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This IE shall be present if the <em>Traffic Class</em> IE is set to &quot;Conversational&quot; or &quot;Streaming&quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>trafficInteractiv</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This IE shall be present if the <em>Traffic Class</em> IE is set to &quot;Interactive&quot;</td>
<td></td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
</tr>
<tr>
<td>SDU parameters</td>
<td></td>
</tr>
<tr>
<td>&gt;SDU Error Ratio</td>
<td>C- ifErrorousSDU</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Mantissa</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Exponent</td>
<td>M</td>
</tr>
<tr>
<td>&gt;Residual Bit Error Ratio</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Mantissa</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Exponent</td>
<td>M</td>
</tr>
<tr>
<td>&gt;Delivery Of Erroneous SDU</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;SDU format information Parameter</td>
<td>O</td>
</tr>
</tbody>
</table>
rates. Given per RAB Subflow Combination with first occurrence corresponding to RAB Subflow Combination number 1. It shall always be present for rate controllable RABs.

<table>
<thead>
<tr>
<th>Range Bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxRABSubflowCombinations</td>
<td>Maximum number of RAB Subflow Combinations. Value is 64.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfErroneousSDU</td>
<td>This IE shall be present if the Delivery Of Erroneous SDU IE is set to &quot;Yes&quot; or &quot;No&quot;.</td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>SDU Format Information Parameter</td>
<td></td>
</tr>
<tr>
<td>&gt;Subflow SDU Size</td>
<td>O</td>
</tr>
<tr>
<td>&gt;RAB Subflow Combination Bit Rate</td>
<td>O</td>
</tr>
</tbody>
</table>
maximum value of the IEs "Maximum Bit Rate". The value 0 of RAB Subflow Combination bitrate indicates that the RAB uses discontinuous transfer of the SDUs.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation/Retention Priority</td>
<td></td>
<td></td>
<td>INTEGER (spare (0), highest (1), ... lowest (14), no priority (15))</td>
<td>Desc.: This IE indicates the priority of the request. <strong>Usage:</strong> Values between 1 and 14 are ordered in decreasing order of priority, ‘1’ being the highest and ‘14’ the lowest. Value 0 shall be treated as a logical error if received. The priority level and the preemption indicators may be used to determine whether the request has to be performed unconditionally and immediately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Priority Level</td>
<td>M</td>
<td></td>
<td>INTEGER (spare (0), highest (1), ... lowest (14), no priority (15)) 0..15</td>
<td>Desc.: This IE indicates the priority of the request. <strong>Usage:</strong> Values between 1 and 14 are ordered in decreasing order of priority, ‘1’ being the highest and ‘14’ the lowest. Value 0 shall be treated as a logical error if received. The priority level and the preemption indicators may be used to determine whether the request has to be performed unconditionally and immediately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Pre-emption Capability</td>
<td>M</td>
<td></td>
<td>ENUMERATE D(shall not trigger pre-emption, may trigger pre-emption)</td>
<td>Desc.: This IE indicates the pre-emption capability of the request on other RABs <strong>Usage:</strong> The RAB shall not pre-empt other RABs or, the RAB may pre-empt other RABs. The Pre-emption Capability indicator applies to the allocation of resources for a RAB and as such it provides the trigger to the pre-emption procedures/processes of the RNS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Pre-emption Vulnerability</td>
<td>M</td>
<td></td>
<td>ENUMERATE D(not pre-emptable, pre-emptable)</td>
<td>Desc.: This IE indicates the vulnerability of the RAB to preemption of other RABs. <strong>Usage:</strong> The RAB shall not be pre-empted by other RABs or the RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the RAB, unless modified and as such indicates whether the RAB is a target of the pre-emption procedures/processes of the RNS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Queuing Allowed</td>
<td>M</td>
<td></td>
<td>ENUMERATE D(queueing not allowed, queueing allowed)</td>
<td>Desc.: This IE indicates whether the request can be placed into a resource allocation queue or not.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 9.2.1.4 Cause

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

<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. |  |  |  |</p>
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Cause</td>
<td></td>
<td></td>
<td>INTEGER</td>
<td>Value range is 1 – 64.</td>
</tr>
<tr>
<td>&gt;&gt;Radio Network Layer Cause</td>
<td>M</td>
<td></td>
<td>(RAB pre-empted(1), Trelcoverall Expiry(2), Trelocprep Expiry(3), Trelloccomplete Expiry(4), Tqueueing Expiry(5), Relocation Triggered(6), 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 Maximum Bit Rate for DL not Available(33), Requested Maximum Bit Rate for UL not Available(34), Requested Guaranteed Bit Rate not Available(21), Requested Guaranteed Bit Rate for DL not Available(35), Requested Guaranteed Bit Rate for UL not Available(36), 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), TRELOCalloc Expiry (7), Relocation Failure in Target CN/RNC or Target System (29), Invalid RAB ID(30), No remaining RAB(31), Interaction with other</td>
<td></td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
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</tr>
<tr>
<td>Choice Cause</td>
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<td></td>
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</tr>
<tr>
<td>&gt;Radio Network Layer</td>
<td></td>
<td></td>
<td></td>
<td>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))</td>
</tr>
<tr>
<td>&gt;Radio Network Layer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Layer Cause</td>
<td>M</td>
<td></td>
<td>INTEGER</td>
<td>Value range is 65 – 80.</td>
</tr>
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<td></td>
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<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
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<tr>
<td>Choice Cause</td>
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<tr>
<td>&gt; Radio Network Layer</td>
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<td></td>
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<tr>
<td>&gt;&gt; NAS</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>&gt;&gt;&gt; NAS Cause</td>
<td>M</td>
<td></td>
<td>INTEGER (User Restriction Start Indication(81), User Restriction End Indication(82),</td>
<td>Value range is 81 – 96.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Normal Release(83), CSG Subscription Expiry(84))</td>
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<tr>
<td>&gt; Protocol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; Protocol Cause</td>
<td>M</td>
<td></td>
<td>INTEGER (Transfer Syntax Error(97), Semantic Error (98), Message not compatible with</td>
<td>Value range is 97 – 112.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>receiver state (99), Abstract Syntax Error (Reject) (100), Abstract Syntax Error (Ignore</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>and Notify) (101), Abstract Syntax Error (Falsely Constructed Message) (102))</td>
<td></td>
</tr>
<tr>
<td>&gt; Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; Miscellaneous Cause</td>
<td>M</td>
<td></td>
<td>INTEGER (O&amp;M Intervention(113), No Resource Available(114), Unspecified Failure(115),</td>
<td>Value range is 113 – 128.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network Optimisation(116))</td>
<td></td>
</tr>
<tr>
<td>&gt; Non-standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; Non-standard Cause</td>
<td>M</td>
<td></td>
<td>INTEGER ()</td>
<td>Value range is 129 – 256. Cause value 256 shall not be used.</td>
</tr>
<tr>
<td>&gt; Radio Network Layer Extension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; Radio Network Layer Cause Extension</td>
<td>M</td>
<td></td>
<td>INTEGER (IP Multicast Address And APN Not Valid(257), MBMS De-Registration Rejected</td>
<td>Value range is 257 – 512.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Due To Implicit Registration(258), MBMS - Request Superseded(259), MBMS De-Registration</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>During Session Not Allowed(260), MBMS - No Data Bearer Necessary(261), Periodic</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Location Information not Available(262), GTP Resources Unavailable(263), TMGI in Use</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>and Overlapping MBMS Service Area (264), MBMS – No cell in MBMS Service Area (265),</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>No Iu CS UP relocation (266), Successful MBMS Session Start – IP Multicast Bearer</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>established (267), CS Fallback triggered (268),</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Cause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Radio Network Layer</td>
<td></td>
<td></td>
<td></td>
<td>invalid CSG Id (269)</td>
</tr>
<tr>
<td>Radio Network Layer cause</td>
<td>Meaning</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>--------------------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deciphering Keys Not Available</td>
<td>The action failed because RNC is not able to provide requested deciphering keys.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict with already existing Integrity protection and/or Ciphering information</td>
<td>The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition Violation For Guaranteed Bit Rate</td>
<td>The action was not performed due to condition violation for guaranteed bit rate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition Violation For SDU Parameters</td>
<td>The action was not performed due to condition violation for SDU parameters.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition Violation For Traffic Handling Priority</td>
<td>The action was not performed due to condition violation for traffic handling priority.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated Assistance data Not Available</td>
<td>The action failed because RNC is not able to successfully deliver the requested dedicated assistance data to the UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directed Retry</td>
<td>The reason for action is Directed Retry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure In The Radio Interface Procedure</td>
<td>Radio interface procedure has failed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incoming Relocation Not Supported Due To PUESBINE Feature</td>
<td>The incoming relocation cannot be accepted by the target RNC because of the PUESBINE feature.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction With Other Procedure</td>
<td>Relocation was cancelled due to interaction with other procedure.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invalid RAB ID</td>
<td>The action failed because the RAB ID is unknown in the RNC.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invalid RAB Parameters Combination</td>
<td>The action failed due to invalid RAB parameters combination.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invalid RAB Parameters Value</td>
<td>The action failed due to invalid RAB parameters value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iu UP Failure</td>
<td>The action failed due to Iu UP failure.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No remaining RAB</td>
<td>The reason for the action is no remaining RAB.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAB Pre-empted</td>
<td>The reason for the action is that RAB is pre-empted.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio Connection With UE Lost</td>
<td>The action is requested due to losing radio connection to the UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Release Due To UE Generated Signalling Connection Release</td>
<td>Release requested due to UE generated signalling connection release.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Release Due To UTRAN Generated Reason</td>
<td>Release is initiated due to UTRAN generated reason.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Cancelled</td>
<td>The reason for the action is relocation cancellation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Desirable for Radio Reasons</td>
<td>The reason for requesting relocation is radio related.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Failure In Target CN/RNC Or Target System</td>
<td>Relocation failed due to a failure in target CN/RNC or target system.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Not Supported In Target RNC Or Target System</td>
<td>Relocation failed because relocation was not supported in target RNC or target system.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Target not allowed</td>
<td>Relocation to the indicated target cell is not allowed for the UE in question.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation Triggered</td>
<td>The action failed due to relocation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeated Integrity Checking Failure</td>
<td>The action is requested due to repeated failure in integrity checking.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request Superseded</td>
<td>The action failed because there was a second request on the same RAB.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Ciphering And/Or Integrity Protection Algorithms Not Supported</td>
<td>The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Guaranteed Bit Rate For DL Not Available</td>
<td>The action failed because requested guaranteed bit rate for DL is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Guaranteed Bit Rate For UL Not Available</td>
<td>The action failed because requested guaranteed bit rate for UL is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Guaranteed Bit Rate Not Available</td>
<td>The action failed because requested guaranteed bit rate is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Information Not Available</td>
<td>The action failed because requested information is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Maximum Bit Rate For DL Not Available</td>
<td>The action failed because requested maximum bit rate for DL is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Maximum Bit Rate For UL Not Available</td>
<td>The action failed because requested maximum bit rate for UL is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Maximum Bit Rate Not Available</td>
<td>The action failed because requested maximum bit rate is not available.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Requested Request Type Not Supported</td>
<td>The RNC is not supporting the requested location request type either because it doesn't support the requested event or...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
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</tr>
<tr>
<td>Location Reporting Congestion</td>
<td>The action was not performed due to an inability to support location reporting caused by overload.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Requested Traffic Class Not Available</td>
<td>The action failed because requested traffic class is not available.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Transfer Delay Not Achievable</td>
<td>The action failed because requested transfer delay is not achievable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource Optimisation Relocation</td>
<td>The reason for requesting relocation is resource optimisation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful Relocation</td>
<td>The reason for the action is completion of successful relocation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Critical Relocation</td>
<td>Relocation is requested for time critical reason i.e. this cause value is reserved to represent all critical cases where the connection is likely to be dropped if relocation is not performed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tQUEUING Expiry</td>
<td>The action failed due to expiry of the timer ( t_{QUEUING} ).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tRELOCalloc Expiry</td>
<td>Relocation Resource Allocation procedure failed due to expiry of the timer ( t_{RELOCalloc} ).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tRELOCcomplete Expiry</td>
<td>The reason for the action is expiry of timer ( t_{RELOCcomplete} ).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tRELOCoverall Expiry</td>
<td>The reason for the action is expiry of timer ( t_{RELOCoverall} ).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tRELOCprep Expiry</td>
<td>Relocation Preparation procedure is cancelled when timer ( t_{RELOCprep} ) expires.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unable To Establish During Relocation</td>
<td>RAB failed to establish during relocation because it cannot be supported in the target RNC or the RAB did not exist in the source RNC.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Unknown Target RNC</td>
<td>Relocation rejected because the target RNC is not known to the CN.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>User Inactivity</td>
<td>The action is requested due to user inactivity on one or several non real time RABs e.g. in order to optimise radio resource.</td>
<td></td>
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</tr>
<tr>
<td>User Plane Versions Not Supported</td>
<td>The action failed because requested user plane versions were not supported.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNC unable to establish all RFCs</td>
<td>RNC couldn’t establish all RAB subflow combinations indicated within the ( RAB Parameters ) IE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce Load in Serving Cell</td>
<td>Load on serving cell needs to be reduced.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Radio Resources Available in Target Cell</td>
<td>Load on target cell is too high.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERAN Iu-mode failure</td>
<td>The RAB establishment/modification/relocation failed because the GERAN BSC cannot provide an appropriate RAB due to limited capabilities within GERAN.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Restricted Due to Shared Networks</td>
<td>Access is not permitted in the cell due to Shared Networks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Load In The Target Cell Higher Than In The Source Cell</td>
<td>Relocation to reduce load in the source cell is rejected, as the target cell’s traffic load is higher than that in the source cell.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBMS - No Multicast Service For This UE</td>
<td>The request for the Multicase Service list of one UE was not fulfilled because the UE does not have any active multicast service.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBMS - Unknown UE ID</td>
<td>The request for the Multicase Service list of one UE was not fulfilled because the CN does not know the UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful MBMS Session Start - No DataBearer Necessary</td>
<td>The MBMS Session Start procedure was successfully performed, but the RNC does not have any interested UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBMS - Superseded Due To NNSF</td>
<td>The MBMS Session Start procedure was rejected because of successful operation towards another CN node.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBMS - UE Linking Already Done</td>
<td>The UE linking failed, because the UE has already been linked to the given Multicast service.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBMS - UE De-Linking Failure - No Existing UE Linking</td>
<td>The UE de-linking failed, because the UE had not been linked to the given Multicast service.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMGI Unknown</td>
<td>The requested MBMS action failed because the indicated TMGI is unknown.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful MBMS Session Start – IP Multicast Bearer established</td>
<td>The RNC was able to join the indicated IP Multicast Group.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Radio Network Layer cause extension

<table>
<thead>
<tr>
<th>Cause</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Multicast Address And APN Not Valid</td>
<td>The MBMS registration failed because the IP Multicast Address and APN are not valid.</td>
</tr>
<tr>
<td>MBMS De-Registration Rejected Due To Implicit Registration</td>
<td>The MBMS De-registration was rejected because of implicit registration.</td>
</tr>
<tr>
<td>MBMS - Request Superseded</td>
<td>The MBMS Registration or De-registration was superseded due to another ongoing procedure.</td>
</tr>
<tr>
<td>MBMS De-Registration During Session Not Allowed</td>
<td>The MBMS De-registration is not allowed during the MBMS session.</td>
</tr>
<tr>
<td>MBMS - No Data Bearer Necessary</td>
<td>The RNC no longer have any UEs interested in the MBMS data bearer.</td>
</tr>
<tr>
<td>Periodic Location Information not Available</td>
<td>No UE position estimate was available when the periodic report was triggered.</td>
</tr>
<tr>
<td>GTP Resources Unavailable</td>
<td>The RNC initiates RAB Release Request procedure with this error cause value if it received a GTP-U error indication.</td>
</tr>
<tr>
<td>TMGI in Use and overlapping MBMS Service Area</td>
<td>The RNC has an MBMS Session up and running with that TMGI, a parallel MBMS session with the same TMGI in another overlapping MBMS Service Area is not allowed.</td>
</tr>
<tr>
<td>MBMS - No Cell in MBMS Service Area</td>
<td>The RNC does not have any cell of the indicated MBMS Service Area.</td>
</tr>
<tr>
<td>No Iu CS UP relocation</td>
<td>The relocation is triggered by CS call and the source RNC has no Iu CS user plane.</td>
</tr>
<tr>
<td>CS Fallback triggered</td>
<td>The relocation was triggered for CS Fallback reason at the source side.</td>
</tr>
<tr>
<td>Invalid CSG Id</td>
<td>The CSG ID provided to the target UTRAN was found invalid.</td>
</tr>
</tbody>
</table>

### Transport Layer cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iu Transport Connection Failed to Establish</td>
<td>The action failed because the Iu Transport Network Layer connection could not be established.</td>
</tr>
<tr>
<td>Signalling Transport Resource Failure</td>
<td>Signalling transport resources have failed (e.g. processor reset).</td>
</tr>
</tbody>
</table>

### NAS cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Release</td>
<td>The release is normal.</td>
</tr>
<tr>
<td>User Restriction Start Indication</td>
<td>A location report is generated due to entering a classified area set by O&amp;M.</td>
</tr>
<tr>
<td>User Restriction End Indication</td>
<td>A location report is generated due to leaving a classified area set by O&amp;M.</td>
</tr>
<tr>
<td>CSG Subscription Expiry</td>
<td>The action is due to the UE becoming a non-member of the currently used CSG.</td>
</tr>
</tbody>
</table>

### Protocol cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract Syntax Error (Reject)</td>
<td>The received message included an abstract syntax error and the concerning criticality indicated “reject”.</td>
</tr>
<tr>
<td>Abstract Syntax Error (Ignore And Notify)</td>
<td>The received message included an abstract syntax error and the concerning criticality indicated “ignore and notify”.</td>
</tr>
<tr>
<td>Abstract Syntax Error (Falsely Constructed Message)</td>
<td>The received message contained IEs or IE groups in wrong order or with too many occurrences.</td>
</tr>
<tr>
<td>Message Not Compatible With Receiver State</td>
<td>The received message was not compatible with the receiver state.</td>
</tr>
<tr>
<td>Semantic Error</td>
<td>The received message included a semantic error.</td>
</tr>
<tr>
<td>Transfer Syntax Error</td>
<td>The received message included a transfer syntax error.</td>
</tr>
</tbody>
</table>

### Miscellaneous cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Optimisation</td>
<td>The action is performed for network optimisation.</td>
</tr>
<tr>
<td>No Resource Available</td>
<td>No requested resource is available.</td>
</tr>
<tr>
<td>O&amp;M Intervention</td>
<td>The action is due to O&amp;M intervention.</td>
</tr>
<tr>
<td>Unspecified Failure</td>
<td>Sent when none of the specified cause values applies.</td>
</tr>
</tbody>
</table>
9.2.1.5  CN Domain Indicator
Indicates the CN domain from which the message originates or to which the message is sent.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN Domain Indicator</td>
<td>M</td>
<td></td>
<td>ENUMERATED (CS domain, PS domain)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.6  Trace Type
Indicates the type of trace information to be recorded. Applicable to GERAN Iu Mode only, not applicable to UTRAN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Type</td>
<td>M</td>
<td></td>
<td>OCTET STRING (1)</td>
<td>Coded as the Trace Type specified in 3GPP TS, as defined in TS 52.008 [62].</td>
</tr>
</tbody>
</table>

9.2.1.7  Trigger ID
Indicates the identity of the entity which initiated the trace. Applicable to GERAN Iu Mode only, not applicable to UTRAN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger ID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (3..22)</td>
<td>Typically an OMC identity.</td>
</tr>
</tbody>
</table>

NOTE: Due to inconsistency in the definition of Trigger ID between TS 25.413 and TS 29.002 [24], it shall be ensured that the Trigger ID IE is coded with at least the minimum number of required octets.

9.2.1.8  Trace Reference
Identifies a trace session and is globally unique within one PLMN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Reference</td>
<td>M</td>
<td></td>
<td>OCTET STRING (2..3)</td>
<td></td>
</tr>
</tbody>
</table>
9.2.1.9 UE Identity

This element identifies the element to be traced i.e. a subscriber or a user equipment.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice UE Identity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;IMSI</td>
<td>M</td>
<td>OCTET STRING (SIZE (3..8))</td>
<td>- 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</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- 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.</td>
<td></td>
</tr>
<tr>
<td>&gt;IMEI</td>
<td>M</td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of hexadecimal digits shall be 15.</td>
<td></td>
</tr>
<tr>
<td>&gt;IMEISV</td>
<td>M</td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of hexadecimal digits shall be 16.</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.10 OMC ID

A variable length element indicating the destination address of the Operation and Maintenance Center (OMC) to which trace information is to be sent. Applicable to GERAN Iu Mode only, not applicable to UTRAN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMC ID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (3..22)</td>
<td>Coded as the OMC ID specified in UMTS TS, as defined in GSM TS 12.20 [25].</td>
</tr>
</tbody>
</table>

NOTE: Due to inconsistency in the definition of OMC ID between TS 25.413 and TS 29.002 [24], it shall be ensured that the OMC ID IE is coded with at least the minimum number of required octets.
9.2.1.11  Integrity Protection Information

This element contains the integrity protection information (key and permitted algorithms).

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrity Protection Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Permitted Integrity Protection Algorithms</td>
<td>1 to 16</td>
<td></td>
<td>INTEGER (</td>
<td>Value range is 0 to 15. Only two values used.</td>
</tr>
<tr>
<td>&gt;&gt;Integrity Protection Algorithm</td>
<td>M</td>
<td></td>
<td>standard UIA1 (0), standard UIA2 (1)</td>
<td></td>
</tr>
<tr>
<td>&gt;Integrity Protection Key</td>
<td>M</td>
<td></td>
<td>BIT STRING (128)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.12  Encryption Information

This element contains the user data encryption information (key and permitted algorithms) used to control any encryption equipment at the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encryption Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Permitted Encryption Algorithms</td>
<td>1 to 16</td>
<td></td>
<td>INTEGER (no encryption (0), standard UEA1 (1), standard UEA2 (2))</td>
<td>Value range is 0 to 15. Only three values used.</td>
</tr>
<tr>
<td>&gt;&gt;Encryption Algorithm</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Encryption Key</td>
<td>M</td>
<td></td>
<td>Bit string (128)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.13  Chosen Integrity Protection Algorithm

This element indicates the integrity protection algorithm being used by the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chosen Integrity Protection Algorithm</td>
<td>M</td>
<td></td>
<td>INTEGER (standard UIA1 (0), standard UIA2 (1), no value (15))</td>
<td>Value range is 0 to 15. Only two values used over Iu interface. The value &quot;no value&quot; shall only be used in case of RANAP signalling over MAP/E TS 29.108 [23].</td>
</tr>
</tbody>
</table>

9.2.1.14  Chosen Encryption Algorithm

This element indicates the encryption algorithm being used by the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>M</td>
<td></td>
<td>INTEGER (no encryption (0), standard UEA1 (1), standard UEA2 (2))</td>
<td>Value range is 0 to 15. Only three values used.</td>
</tr>
</tbody>
</table>
9.2.1.15 Categorisation Parameters

Void.

9.2.1.16 Request Type

This element indicates the type of location request to be handled by the RNC; the related reported area is either a Service Area or a Geographical Area.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request Type</td>
<td></td>
<td></td>
<td>EXTENDED(</td>
<td></td>
</tr>
<tr>
<td>&gt;Event</td>
<td>M</td>
<td></td>
<td>ENUMERATED(Stop Change of service area, Direct, Change of service area, ..., Stop Direct, Periodic)</td>
<td></td>
</tr>
<tr>
<td>&gt;Report Area</td>
<td>M</td>
<td></td>
<td>ENUMERATED(Service Area, Geographical Area, ...)</td>
<td>When the Event IE is set to &quot;Stop Change of service area&quot; or to &quot;Stop Direct&quot;, the value of the Report area IE shall be the same as in the LOCATION REPORTING CONTROL message that initiated the location reporting.</td>
</tr>
<tr>
<td>&gt;Accuracy Code</td>
<td>O</td>
<td></td>
<td>INTEGER (0..127)</td>
<td>The requested accuracy &quot;r&quot; is derived from the &quot;accuracy code&quot; k by r = 10*(1.1^k-1). The Accuracy Code IE shall be understood as the horizontal accuracy code.</td>
</tr>
</tbody>
</table>

9.2.1.17 Data Volume Reporting Indication

This information element indicates whether or not the RNC has to calculate the unsuccessfully transmitted NAS data amount for a given RAB and to report the amount of unsuccessfully transmitted NAS data when the RAB is released.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Volume Reporting Indication</td>
<td>M</td>
<td></td>
<td>ENUMERATED(do report, do not report)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.18 User Plane Mode

This element indicates the mode of operation of the Iu User plane requested for realising the RAB. The Iu User plane modes are defined in TS 25.415 [6].
### 9.2.1.19 UP Mode Versions

**UP mode versions** IE is an information element that is sent by CN to RNC. It is a bit string that indicates the versions for the selected Iu UP mode that are required and supported by the CN. The Iu User plane mode versions shall be defined and coded as the "Iu UP Mode versions supported" field defined in TS 25.415 [6]. This reference is applicable for both the transparent mode and the support mode for predefined SDU sizes.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP Mode Versions</td>
<td>M</td>
<td></td>
<td>BIT STRING (16)</td>
<td>Indicates the versions of the selected UP mode that are required and supported by the CN</td>
</tr>
</tbody>
</table>

### 9.2.1.20 Chosen UP Version

Void.

### 9.2.1.21 Paging Area ID

This element identifies the area where a PAGING message shall be broadcasted. The Paging area ID is either a Location Area ID or a Routing Area ID.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Paging Area ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;LAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;LAI</td>
<td>M</td>
<td></td>
<td>9.2.3.6</td>
<td></td>
</tr>
<tr>
<td>&gt;RAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;LAI</td>
<td>M</td>
<td></td>
<td>9.2.3.6</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>M</td>
<td></td>
<td>9.2.3.7</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.22 Non Searching Indication

This parameter allows the RNC not to search Common ID when receiving a PAGING message from the CN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Searching Indication</td>
<td>M</td>
<td></td>
<td>ENUMERATED (non-searching, searching)</td>
<td></td>
</tr>
</tbody>
</table>
9.2.1.23 Relocation Type

This information element indicates whether the relocation of SRNS is to be executed with or without involvement of the UE. If the UE is involved then a radio interface handover command shall be sent to the UE to trigger the execution of the relocation. If the UE is not involved then the relocation execution is triggered via Iur.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocation Type</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(UE not involved in relocation of SRNS, UE involved in relocation of SRNS, ...)</td>
</tr>
</tbody>
</table>

9.2.1.24 Source ID

The Source ID IE identifies the source for the relocation of SRNS. The Source ID may be e.g. the source RNC-ID (for UMTS-UMTS relocation and UMTS to LTE relocation) or the SAI of the relocation source (in case of UMTS to GSM relocation).

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Source ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Source RNC-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RNC-ID</td>
<td>M</td>
<td></td>
<td>INTEGER (0..4095)</td>
<td>If the Extended RNC-ID IE is included in the Source ID IE, the RNC-ID IE shall be ignored.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Extended RNC-ID</td>
<td>O</td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;SAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;SAI</td>
<td>M</td>
<td></td>
<td>9.2.3.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.25 Target ID

The Target ID IE identifies the target for the relocation of SRNS. The target ID may be e.g. the target RNC-ID (for UMTS-UMTS relocation) or the Cell Global ID of the relocation target (in case of UMTS to GSM relocation). In case of UMTS to E-UTRAN relocation, the Target ID may be either the eNB-ID or the Corresponding RNC-ID of the relocation target.
NOTE: The mapping between the Corresponding RNC-ID and the actual eNB-ID of the relocation target is defined by the network operator and is outside the scope of this specification. Preferably the Target RNC ID used for an eNB contains the LAI and RAC mapped from the GUMMEI of the MME serving the target eNB as specified within TS 23.003 [19]. This avoids configuration of additional identity resolutions and also guarantees that LAIs used for E-UTRAN and UTRAN are mutually exclusive.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Target ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Target RNC-ID</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Target RNC-ID</td>
<td>M</td>
<td></td>
<td>INTEGER (0..4095)</td>
<td>If the Extended RNC-ID IE is included in the Target ID IE, the RNC-ID IE shall be ignored. In case of UMTS to E-UTRAN relocation, if included, this IE will contain the Corresponding RNC-ID of the target eNB.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>O</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RNC-ID</td>
<td>M</td>
<td>9.2.1.39a</td>
<td>OCTET STRING (SIZE (3))</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES reject</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Extended RNC-ID</td>
<td>O</td>
<td>9.2.3.7</td>
<td>OCTET STRING (2)</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n     - The PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;CGI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;CGI</td>
<td>M</td>
<td></td>
<td>OCTET STRING (2)</td>
<td>0000 and FFFE not allowed.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;PLMN identity</td>
<td>M</td>
<td>9.2.3.7</td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n     - The PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;LAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td>OCTET STRING (2)</td>
<td>0000 and FFFE not allowed.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;CI</td>
<td>M</td>
<td>9.2.3.7</td>
<td>OCTET STRING (2)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>O</td>
<td>9.2.3.7</td>
<td>OCTET STRING (2)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Target eNB-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Target eNB-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;PLMN identity</td>
<td>M</td>
<td>9.2.3.7</td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n     - The PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### 9.2.1.26 MS Classmark 2

The coding of this element is described in TS 25.331 [10].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Classmark 2</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the Mobile Station Classmark 2 IE, as defined in TS 25.331 [10]</td>
</tr>
</tbody>
</table>

### 9.2.1.27 MS Classmark 3

The coding of this element is described in TS 25.331 [10].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Classmark 3</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the Mobile Station Classmark 3 IE, as defined in TS 25.331 [10]</td>
</tr>
</tbody>
</table>

### 9.2.1.28 Source RNC to Target RNC Transparent Container

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

This IE is transparent to the CN.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRC Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Number of Iu Instances</td>
<td>M</td>
<td></td>
<td>INTEGER (1..2)</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Relocation Type</td>
<td>M</td>
<td>9.2.1.23</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Chosen Integrity Protection Algorithm</td>
<td>O</td>
<td>9.2.1.13</td>
<td>Indicates the integrity protection algorithm.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrity Protection Key</td>
<td>O</td>
<td></td>
<td>Bit String (128)</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td>9.2.1.14</td>
<td>Indicates the algorithm for ciphering of signalling data.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciphering Key</td>
<td>O</td>
<td></td>
<td>Bit String (128)</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td>9.2.1.14</td>
<td>Indicates the algorithm for ciphering of CS user data.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chosen Encryption Algorithm</td>
<td>O</td>
<td>9.2.1.14</td>
<td>Indicates the algorithm for ciphering of PS user data.</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d-RNTI</td>
<td>C</td>
<td></td>
<td>INTEGER (0..1048575 )</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Target Cell ID</td>
<td>C</td>
<td></td>
<td>INTEGER (0..2684354 55)</td>
<td>This information element identifies a cell uniquely within UTRAN and consists of RNC-ID and C-ID as defined in TS 25.401 [3] or Cell Identity IE as defined in TS 25.331[10] if the target is a HNB TS 25.467 [55].</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cell Load Information Group</td>
<td>O</td>
<td>9.2.1.60</td>
<td>For &quot;Cell Load-Based Inter-System Handover&quot;</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAB TrCH Mapping</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;RAB ID</td>
<td>M</td>
<td>9.2.1.2</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;RAB Subflow</td>
<td>M</td>
<td></td>
<td>1 to &lt;maxRAB-Subflows&gt;</td>
<td>The RAB Subflows shall be presented in an order that corresponds to the order in which the RBs are presented per RAB in the RRC container included in this IE.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Transport Channel IDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;DCH ID</td>
<td>O</td>
<td></td>
<td>INTEGER (0..55)</td>
<td>The DCH ID is the identifier of an active dedicated transport channel. It is unique for each active DCH among the active DCHs simultaneously allocated for the</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>Octet</td>
<td>Type</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;DSCH ID</td>
<td>O</td>
<td>INTEGER (0..255)</td>
<td>The DSCH ID is the identifier of an active downlink shared transport channel. It is unique for each DSCH among the active DSCHs simultaneously allocated for the same UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;USCH ID</td>
<td>O</td>
<td>INTEGER (0..255)</td>
<td>The USCH ID is the identifier of an active uplink shared transport channel. It is unique for each USCH among the active USCHs simultaneously allocated for the same UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;HS-DSCH MAC-d Flow ID</td>
<td>O</td>
<td>INTEGER (0..7)</td>
<td>The HS-DSCH MAC-d Flow ID is the identifier of an HS-DSCH MAC-d flow over Iur.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;E-DCH MAC-d Flow ID</td>
<td>O</td>
<td>INTEGER (0..7)</td>
<td>The E-DCH MAC-d Flow ID is the identifier of an E-DCH MAC-d flow over Iur.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;CN Domain Indicator</td>
<td>M</td>
<td>9.2.1.5</td>
<td>YES ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRB TrCH Mapping</td>
<td>O</td>
<td>1 to &lt;maxnoofSRBs&gt;</td>
<td>GLOBAL reject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;SRB ID</td>
<td>M</td>
<td>INTEGER (1..32)</td>
<td>The SRB ID is the absolute value of the SRB.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;DCH ID</td>
<td>O</td>
<td>INTEGER (0..255)</td>
<td>The DCH ID is the identifier of an active dedicated transport channel over Iur. It is unique for each active DCH among the active DCHs simultaneously allocated for the same UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;DSCH ID</td>
<td>O</td>
<td>INTEGER (0..255)</td>
<td>The DSCH ID is the identifier of an active downlink shared transport channel over Iur. It is unique for each DSCH among the active DSCHs simultaneously allocated for the same UE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;USCH ID</td>
<td>O</td>
<td>INTEGER (0..255)</td>
<td>The USCH ID is the identifier of an active uplink shared transport channel over Iur. It is unique for each USCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If UEnotinvolved</td>
<td>This IE shall be present if the Relocation type IE is set to &quot;UE not involved in relocation of SRNS&quot;.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If UEinvolved</td>
<td>This IE shall be present if the Relocation type IE is set to &quot;UE involved in relocation of SRNS&quot;.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
<tr>
<td>maxRABSubflows</td>
<td>Maximum no. of subflows per RAB. Value is 7.</td>
</tr>
<tr>
<td>maxnoofSRBs</td>
<td>Maximum no. of SRBs per RAB. Value is 8.</td>
</tr>
</tbody>
</table>

### 9.2.1.29 Old BSS to New BSS Information

The coding of this element is described 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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old BSS To New BSS Information</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the Old BSS to New BSS information elements field of the Old BSS to New BSS Information IE defined inTS 48.008 [11].</td>
</tr>
</tbody>
</table>

### 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.

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

### 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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source to Target Transparent Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>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 Source RNC to Target RNC Transparent Container or the Source eNB to Target eNB Transparent Container IE as defined in TS 36.413 [49].</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source to Target Transparent Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>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 Source RNC to Target RNC Transparent Container or the Source eNB to Target eNB Transparent Container IE as defined in TS 36.413 [49].</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source to Target Transparent Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>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 Source RNC to Target RNC Transparent Container or the Source eNB to Target eNB Transparent Container IE as defined in TS 36.413 [49].</td>
</tr>
</tbody>
</table>
### Target to Source Transparent Container

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target to Source Transparent Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>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],</td>
</tr>
</tbody>
</table>

#### 9.2.1.30c TAI

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The Selected PLMN identity consists of 3 digits from MCC followed by either -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
<tr>
<td>TAC</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (2))</td>
<td></td>
</tr>
</tbody>
</table>

#### 9.2.1.31 L3 Information

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

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

#### 9.2.1.32 Number of Steps

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Of Steps</td>
<td>M</td>
<td></td>
<td>INTEGER (1..16)</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL N-PDU Sequence Number</td>
<td>M</td>
<td></td>
<td>INTEGER (0 ..65535)</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL N-PDU Sequence Number</td>
<td>M</td>
<td></td>
<td>INTEGER (0 ..65535)</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criticality Diagnostics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Procedure Code</td>
<td>O</td>
<td></td>
<td>INTEGER (0..255)</td>
<td>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.</td>
</tr>
<tr>
<td>&gt;Triggering Message</td>
<td>O</td>
<td></td>
<td>ENUMERATED (initiating message, successful outcome, unsuccessful outcome, outcome)</td>
<td>The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.</td>
</tr>
<tr>
<td>&gt;Procedure Criticality</td>
<td>O</td>
<td></td>
<td>ENUMERATED (reject, ignore, notify)</td>
<td>This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure).</td>
</tr>
<tr>
<td>Information Element</td>
<td></td>
<td>0 to &lt;maxnoof errors&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criticality Diagnostics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;IE Criticality</td>
<td>M</td>
<td></td>
<td>ENUMERATED (reject, ignore, notify)</td>
<td>The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.</td>
</tr>
<tr>
<td>&gt;IE ID</td>
<td>M</td>
<td>INTEGER (0..65535)</td>
<td>The IE ID of the not understood or missing IE</td>
<td></td>
</tr>
<tr>
<td>&gt;Repetition Number</td>
<td>O</td>
<td></td>
<td>INTEGER (0..255)</td>
<td>The Repetition Number IE gives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• in case of a not understood IE: The number of occurrences of the reported IE up to and including the not understood occurrence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• in case of a missing IE: The number of occurrences up to but not including the missing occurrence.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Note: All the counted occurrences of the reported IE must have the same topdown hierarchical message structure of IEs with assigned criticality above them.</td>
</tr>
<tr>
<td>&gt;Message Structure</td>
<td>O</td>
<td>9.2.1.42</td>
<td></td>
<td>The Message Structure IE describes 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.</td>
</tr>
<tr>
<td>&gt;Type of Error</td>
<td>M</td>
<td></td>
<td>ENUMERATED (not understood, missing, ...)</td>
<td></td>
</tr>
<tr>
<td>Range bound</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxnooferrors</td>
<td>Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Status</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(old, new, …)</td>
</tr>
</tbody>
</table>

9.2.1.37   DRX Cycle Length Coefficient

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRX Cycle Length Coefficient</td>
<td>M</td>
<td></td>
<td>INTEGER</td>
<td>(6..9)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iu Signalling Connection Identifier</td>
<td>M</td>
<td></td>
<td>BIT STRING (SIZE(24))</td>
<td>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</td>
</tr>
</tbody>
</table>

9.2.1.39   Global RNC-ID

The Global RNC-ID is used to globally identify an RNC.
### 9.2.1.39a Extended RNC-ID

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

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

### 9.2.1.40 PDP Type Information

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDP Type Information</td>
<td>M</td>
<td>1 to &lt;maxnoofPDPDirections&gt;</td>
<td>ENUMERATED(empty, PPP, OSP:IHOSS, IPv4, IPv6,...)</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofPDPDirections</td>
<td>Number of directions for which PDP Type is signalled separately</td>
</tr>
</tbody>
</table>
9.2.1.40a PDP Type Information extension

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDP Type Information extension</td>
<td>M</td>
<td>1 to &lt;maxnoofPDPDirections&gt;</td>
<td>ENUMERATED(IPv4 and IPv6,...)</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofPDPDirections</td>
<td>Number of directions for which PDP Type is signalled separately</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Handover</td>
<td>M</td>
<td></td>
<td>ENUMERATED (Handover to GSM should be performed, Handover to GSM should not be performed, Handover to GSM shall not be performed, ...)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.42 Message Structure

The Message Structure IE gives information for each level with assigned criticality in a hierachical message structure from top level down to the lowest level above the reported level for the occured error (reported in the Information Element Criticality Diagnostics IE).
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message structure</td>
<td></td>
<td>1 to &lt;maxnooflevels&gt;</td>
<td></td>
<td>The first repetition of the Message Structure IE corresponds to the top level of the message. The last repetition of the Message Structure IE corresponds to the level above the reported level for the occurred error of the message.</td>
<td>GLOBAL</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;IE ID</td>
<td>M</td>
<td>INTEGER (0..65535)</td>
<td></td>
<td>The IE ID of this level&quot;s IE containing the not understood or missing IE.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Repetition Number</td>
<td>O</td>
<td>INTEGER (1..256)</td>
<td></td>
<td>The Repetition Number IE gives, if applicable, the number of occurrences of this level&quot;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.</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnooflevels</td>
<td>Maximum no. of message levels to report. The value for maxnooflevels is 256.</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative RAB parameter values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Alternative Maximum Bit Rate information</td>
<td>O</td>
<td></td>
<td></td>
<td>Included only if negotiation is allowed for this IE.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Type of Alternative Maximum Bit Rate Information</td>
<td>M</td>
<td>ENUMERATED (Unspecified, Value range, Discrete values)</td>
<td>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 RAB Parameters IE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Alternative Maximum Bit Rates</td>
<td>C - ifValueRangeorDiscreteValuesM</td>
<td>1 to &lt;nbr-Alternative Values&gt;</td>
<td>For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the RAB Parameters IE. For Discrete Values; 1 to 16 discrete values can be given.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Bit Rate</td>
<td>M</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Alternative Guaranteed Bit Rate Information</td>
<td>O</td>
<td></td>
<td></td>
<td>Included only if negotiation is allowed for this IE.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Type of Alternative Guaranteed Bit Rate Information</td>
<td>M</td>
<td>ENUMERATED (Unspecified, Value range, Discrete values)</td>
<td>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 RAB Parameters IE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Alternative Guaranteed Bit Rates</td>
<td>C - ifValueRangeorDiscreteValuesG</td>
<td>1 to &lt;nbr-Alternative Values&gt;</td>
<td>For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the RAB Parameters IE. For Discrete Values, 1 to 16 discrete values can be given.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Bit Rate</td>
<td>M</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Alternative RAB Configuration</td>
<td>O</td>
<td>RAB Parameters 9.2.1.3</td>
<td>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].</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Extended Alternative Maximum Bit Rate Information</td>
<td>O</td>
<td></td>
<td></td>
<td>Included only if negotiation is allowed for this IE.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;&gt;Type of Extended Alternative Maximum Bit Rate</td>
<td>M</td>
<td>ENUMERATED (Unspecified, Value range, Discrete values)</td>
<td>Unspecified means that negotiation is allowed, but no alternative values are provided from the CN, i.e., the RNC is</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Information

<table>
<thead>
<tr>
<th>extended alternative maximum bit rates</th>
<th>C- ifValueRange or DiscreteValuesMBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Alternative Values&gt;</td>
<td>For Value Range, one value limit is given here and the other given by Extended Maximum Bit Rate in the RAB Parameters IE. For Discrete Values; 1 to 16 discrete values can be given.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>extended bit rate</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>extended alternative guaranteed bit rate information</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>included only if negotiation is allowed for this IE.</td>
<td>YES ignore</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>extended alternative guaranteed bit rates</th>
<th>C- ifValueRange or DiscreteValuesGBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Alternative Values&gt;</td>
<td>For Value Range, one value limit is given here and the other given by Extended Guaranteed Bit Rate in the RAB Parameters IE. For Discrete Values; 1 to 16 discrete values can be given.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>extended bit rate</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>supported alternative maximum bit rate information</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>included only if negotiation is allowed for this IE.</td>
<td>EACH reject</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>type of supported alternative maximum bit rate information</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENUMERATED (Unspecified, Value range, Discrete values)</td>
<td>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 RAB Parameters IE.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>supported alternative maximum bit rates</th>
<th>C- ifValueRange or DiscreteValuesGBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Alternative Values&gt;</td>
<td>For Value Range, one value limit is given here and the other given by Supported Maximum Bit Rate in the RAB Parameters IE. For Discrete Values; 1 to 16 discrete values can be given.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>supported bit rate</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to &lt;nbr-Separate TrafficDirections&gt;</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then the Supported Bit Rate attribute for downlink is</td>
</tr>
</tbody>
</table>
### 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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assigned RAB parameter values</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Assigned Maximum Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..16,000,000)</td>
<td>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.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Assigned Guaranteed Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (0..16,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&gt;Extended Assigned Maximum Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (16,000,001..256,000,000)</td>
<td>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.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;Extended Assigned Guaranteed Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (16,000,001..256,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.</td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;Supported Assigned Maximum Bit Rate</td>
<td></td>
<td>0 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000,000, …)</td>
<td>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.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>&gt;Supported Assigned Guaranteed Bit Rate</td>
<td></td>
<td>0 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000,000, …)</td>
<td>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.</td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>
### 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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested RAB Parameter Values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Requested Maximum Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..16,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Requested Guaranteed Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (0..16,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Alternative RAB Configuration Request</td>
<td>O</td>
<td></td>
<td>ENUMERATE D (Alternative RAB configuration Requested, …)</td>
<td>Indicates a request to trigger the execution of the alternative RAB Configuration e.g. for network-initiated SCUDIF purpose TS 23.172 [43].</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Extended Requested Maximum Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (16,000,001..2 56,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.</td>
<td>YES reject</td>
<td></td>
</tr>
<tr>
<td>&gt; Extended Requested Guaranteed Bit Rate</td>
<td>O</td>
<td>1 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (16,000,001..2 56,000,000)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.</td>
<td>YES reject</td>
<td></td>
</tr>
<tr>
<td>&gt; Supported Requested Maximum Bit Rate</td>
<td>0</td>
<td>0 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000, 000, …)</td>
<td>When nbr-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.</td>
<td>YES reject</td>
<td></td>
</tr>
<tr>
<td>&gt; Supported Requested Guaranteed Bit Rate</td>
<td>0</td>
<td>0 to &lt;nbr-SeparateTrafficDirections&gt;</td>
<td>INTEGER (1..1,000,000, 000, …)</td>
<td>When nbr-SeparateTrafficDirections is equal to 2, Supported Requested Guaranteed Bit Rate for downlink is signalled first, then Supported Requested Guaranteed Bit Rate for uplink.</td>
<td>YES reject</td>
<td></td>
</tr>
</tbody>
</table>
9.2.1.46 Global CN-ID

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n - The PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
<tr>
<td>CN-ID</td>
<td>M</td>
<td></td>
<td>INTEGER (0..4095)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.46a Vertical Accuracy Code

This element includes information about the requested vertical accuracy.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Accuracy Code</td>
<td>M</td>
<td></td>
<td>INTEGER (0..127)</td>
<td>The requested accuracy &quot;v&quot; is derived from the &quot;accuracy code&quot; k by \v = 45x(1.025^-1)\</td>
</tr>
</tbody>
</table>

9.2.1.46b Response Time

This element includes information about the requested response time.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Time</td>
<td>M</td>
<td></td>
<td>ENUMERATED (Low Delay, Delay Tolerant, ...)</td>
<td>The value refers to TS 22.071 [30].</td>
</tr>
</tbody>
</table>

9.2.1.46c Positioning Priority

This element includes information about the requested positioning priority.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning Priority</td>
<td>M</td>
<td></td>
<td>ENUMERATED (High Priority, Normal Priority, ...)</td>
<td>The value refers to TS 22.071 [30].</td>
</tr>
</tbody>
</table>

9.2.1.46d Client Type

This element includes information about the client type.

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

9.2.1.47 New BSS to Old BSS Information

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>

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.
### 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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downlink Cell Load Information</td>
<td>O</td>
<td></td>
<td>Cell Load Information 9.2.1.49</td>
<td>For the Downlink</td>
</tr>
<tr>
<td>Uplink Cell Load Information</td>
<td>O</td>
<td></td>
<td>Cell Load Information 9.2.1.49</td>
<td>For the Uplink</td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Capacity Class Value</td>
<td>M</td>
<td></td>
<td>INTEGER (1..100,...)</td>
<td>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.</td>
</tr>
<tr>
<td>Load Value</td>
<td>M</td>
<td></td>
<td>INTEGER (0..100)</td>
<td>Value 0 shall indicate the minimum load, and 100 shall indicate the maximum load. Load Value should be measured on a linear scale.</td>
</tr>
</tbody>
</table>

### 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.

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

### 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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT Load Value</td>
<td>M</td>
<td></td>
<td>INTEGER (0..100)</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>
| 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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRC Container</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.55 Information Transfer ID

Indicates the identity of an information transfer.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Transfer ID</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^20-1)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.56 Provided Data

Provides the data that is transferred in an information transfer.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Provided Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared Network Information</td>
<td>M</td>
<td></td>
<td></td>
<td>9.2.3.23</td>
</tr>
</tbody>
</table>
9.2.1.57 GERAN Classmark

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>

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.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>

9.2.1.59 UESBI-Iu

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>
| UESBI-IuA     | O        |       | BIT STRING (1..128)   | The **UESBI-IuA** provides compliance status information about the UE with regards to specific behaviours described in TR 25.994 [31].
|               |          |       |                       | TR 25.994 [31] defines the mapping between the descriptions in TR 25.994 [31] and the **UESBI-IuA**.
|               |          |       |                       | Each bit on a certain position is associated with a certain behaviour described in TR 25.994 [31]. |
| UESBI-IuB     | O        |       | BIT STRING (1..128)   | The **UESBI-IuB** provides compliance status information about the UE with regards to specific behaviours described in TR 25.995 [32].
|               |          |       |                       | TR 25.995 [32] defines the mapping between the descriptions in TR 25.995 [32] and the **UESBI-IuB**.
|               |          |       |                       | Each bit on a certain position is associated with a certain behaviour described in TR 25.995 [32]. |

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.

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

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).
### 9.2.1.62 Inter-system Information Transfer Type

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Inter-system Information Transfer Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RIM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RIM Transfer</td>
<td>M</td>
<td></td>
<td>9.2.3.30</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.63 Information Transfer Type

Indicates the type of information that the RNC requests to transfer.
### 9.2.1.64 RNC Trace Session Information

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

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Reference</td>
<td>M</td>
<td></td>
<td>9.2.1.8</td>
<td></td>
</tr>
<tr>
<td>Trace Activation Indicator</td>
<td>M</td>
<td></td>
<td>ENUMERATED (Activated, Deactivated)</td>
<td></td>
</tr>
<tr>
<td>Equipments To Be Traced</td>
<td>C-IfActivated</td>
<td></td>
<td>9.2.1.65</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfActivated</td>
<td>This IE shall be present if the Trace Activation Indicator IE is set to &quot;Activated&quot;.</td>
</tr>
</tbody>
</table>

### 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.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Equipments To Be Traced</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;IMEI List</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;IMEI List</td>
<td>M</td>
<td>1 to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;MaxUEsToBeTraced&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;IMEI</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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.</td>
</tr>
<tr>
<td>&gt;&gt;IMEISV List</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;IMEISV List</td>
<td>M</td>
<td>1 to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;MaxUEsToBeTraced&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;IMEISV</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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.</td>
</tr>
<tr>
<td>&gt;&gt;IMEI Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;IMEI</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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.</td>
</tr>
<tr>
<td>&gt;&gt;IMEI Mask</td>
<td>M</td>
<td></td>
<td>BIT STRING (SIZE (7))</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;IMEISV Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;IMEISV</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (8))</td>
<td>- 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.</td>
</tr>
</tbody>
</table>
The IMEI Group is identified by all the IMEI values whose digits 1 to 8 are equal to the corresponding digits of the IMEI IE and whose digits n+9 are equal to the corresponding digits of the IMEI IE if the bit bn of the IMEI Mask IE is equal to 1.

The IMEISV Group is identified by all the IMEISV values whose digits 1 to 8 are equal to the corresponding digits of the IMEISV IE and whose digits n+9 are equal to the corresponding digits of the IMEI IE if the bit bn of the IMEISV Mask IE is equal to 1.

### 9.2.1.66 Trace Recording Session Information

Provides the information on a Trace Record being generated in the Source RNC at the time of.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Reference</td>
<td>M</td>
<td></td>
<td>9.2.1.8</td>
<td></td>
</tr>
<tr>
<td>Trace Recording Session</td>
<td>M</td>
<td></td>
<td>9.2.1.67</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.67 Trace Recording Session Reference

Identifier of a Trace Record.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Recording Session</td>
<td>M</td>
<td></td>
<td>INTEGER</td>
<td>(0..65535)</td>
</tr>
</tbody>
</table>

### 9.2.1.68 Trace Propagation Parameters

Indicates the trace parameters to activate a trace session by a trace parameter propagation.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Recording Session</td>
<td>M</td>
<td></td>
<td>9.2.1.67</td>
<td></td>
</tr>
<tr>
<td>Trace Depth</td>
<td>M</td>
<td></td>
<td>9.2.1.69</td>
<td></td>
</tr>
<tr>
<td>List Of Interfaces To Trace</td>
<td>O</td>
<td></td>
<td>9.2.1.70</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.69 Trace Depth

Indicates how detailed information should be recorded for this trace session in the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Depth</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>See TS 32.422 [38].</td>
</tr>
</tbody>
</table>
### 9.2.1.70 List Of Interfaces To Trace
Indicates the interface(s) to be traced by RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>List Of Interfaces To Trace</td>
<td></td>
<td>1 to &lt;maxInterfaces&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Interface</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(Iu-CS, Iu-PS, Iur, Iub, Uu, ...)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxInterfaces</td>
<td>Maximum no. of different UTRAN interfaces to trace. The value for maxInterfaces is 16.</td>
</tr>
</tbody>
</table>

### 9.2.1.71 Information Exchange ID
Indicates the identity of an information exchange.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Exchange ID</td>
<td>M</td>
<td></td>
<td>INTEGER</td>
<td>(0..2^20-1)</td>
</tr>
</tbody>
</table>

### 9.2.1.72 Information Exchange Type
Indicates the nature of the information exchange i.e. transfer or request of specific information.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Exchange Type</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(transfer, request, ...)</td>
</tr>
</tbody>
</table>

### 9.2.1.73 Information Request Type
Indicates the type of information requested by the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Information Request Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;MBMS IP MC Address and APN Request</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;MBMS IP Multicast Address and APN Request</td>
<td>M</td>
<td></td>
<td>9.2.1.78</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Permanent NAS UE ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Permanent NAS UE Identity</td>
<td>M</td>
<td></td>
<td>9.2.3.1</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.74 Information Requested
Provides the RNC with the requested information.
### 9.2.1.75 PTP RAB ID

This element uniquely identifies a MBMS PTP radio bearer for a particular UE.

The value is used in the RNC to relate MBMS PTP Radio Bearers to a MBMS RAB. The content of this information element is transferred unchanged from the SGSN via the RNC to the UE by RANAP messages and RRC messages. For RRC messages refer to TS 25.331 [10].

The element contains binary representation of the Network Service Access Point Identifier (NSAPI). This identifier is coded in the PTP RAB ID element in accordance with the coding of the NSAPI IE in TS 24.008 [8].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTP RAB ID</td>
<td>M</td>
<td></td>
<td>BIT STRING (8)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.76 Frequency Layer Convergence Flag

Indicates to the RNC the requirement to not apply Frequency Layer Convergence for a given MBMS Bearer Service.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Layer Convergence Flag</td>
<td>M</td>
<td></td>
<td>ENUMERATED(</td>
<td>no-FLC-flag, ...</td>
</tr>
</tbody>
</table>

### 9.2.1.77 Session Update ID

Indicates the identity of a Session Update procedure.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Update ID</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^20-1)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.78 MBMS IP Multicast Address and APN Request

Indicates the list of MBMS Bearer Services identified by their respective TMGIs, for which the IP Multicast Address and APN are requested by the RNC.
### MBMS IP Multicast Address and APN Request

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;TMGI</td>
<td>M</td>
<td>1 to &lt;maxnoofMulticastServicesPerRNC &gt;</td>
<td>9.2.3.37</td>
<td></td>
</tr>
</tbody>
</table>

### maxnoofMulticastServicesPerRNC

Maximum no. of Multicast Services that a RNC can have context for. Value is 512.

---

### 9.2.1.79 Source BSS to Target BSS Transparent Container

The coding of this element is described in TS 48.018 [36].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source BSS to Target BSS Transparent Container</td>
<td>M</td>
<td>OCTET STRING</td>
<td>Coded as the value (V) part of the Source BSS to Target BSS Transparent Container IE defined in TS 48.018 [36].</td>
<td></td>
</tr>
</tbody>
</table>

---

### 9.2.1.80 Target BSS to Source BSS Transparent Container

This IE contains information provided by the external inter-system handover target.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target BSS to Source BSS Transparent Container</td>
<td>M</td>
<td>OCTET STRING</td>
<td>Coded as the value (V) part of the Target BSS to Source BSS Transparent Container IE defined in TS 48.018 [36].</td>
<td></td>
</tr>
</tbody>
</table>

---

### 9.2.1.81 Include Velocity

This element indicates that the Location Report may include the UE’s velocity.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include Velocity</td>
<td>M</td>
<td>ENUMERATED(requested)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### 9.2.1.82 Periodic Location Info

The *Periodic Location Info* IE contains the periodic reporting interval and reporting amount for periodic location.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting Amount</td>
<td>M</td>
<td>INTEGER(1..8639999…)</td>
<td>This IE indicates the amount of periodic reports.</td>
<td></td>
</tr>
<tr>
<td>Reporting Interval</td>
<td>M</td>
<td>INTEGER(1..8639999,…)</td>
<td>This IE indicates the reporting interval in seconds.</td>
<td></td>
</tr>
</tbody>
</table>
9.2.1.83 Last Visited UTRAN Cell Information

The Last Visited UTRAN Cell Information contains information about a cell that is to be used for RRM purposes.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTRAN Cell ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| >PLMN identity         | M        |         | OCTET STRING (SIZE (3))       | - digits 0 to 9, encoded 0000 to 1001, 1111 used as filler digit, two digits per octet,  
|                        |          |         |                               | - bits 4 to 1 of octet n encoding digit 2n-1, bits 8 to 5 of octet n encoding digit 2n   |
|                        |          |         |                               | - The PLMN identity consists of 3 digits from MCC followed by either                    |
|                        |          |         |                               | - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or                    |
|                        |          |         |                               | - 3 digits from MNC (in case of a 3 digit MNC).                                         |
| >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].                                            |
| Cell Type              | M        |         | ENUMERATED (macro, micro,     | Defined in TS 25.104 [50].                                                            |
|                        |          |         | pico, femto, ...)              |                                                                                        |
| Time UE Stayed In Cell | M        |         | INTEGER (0..4095)             | The duration of the time the UE stayed in the cell in seconds. If the UE stays in a    |
|                        |          |         |                               | cell more than 4095s, this IE is set to 4095                                           |

9.2.1.84 MBMS HC Indicator

This element indicates whether the payload of user data packets of the MBMS RAB are provided with compressed IP header. Respective information within SYNC-protocol data frames are defined in TS 25.446 [51].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS HC Indicator</td>
<td>M</td>
<td></td>
<td>ENUMERATED (uncompressed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>header, compressed header, ...)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.85 CSG Id

This information element indicates the identifier of the closed subscriber group, as defined in TS 23.003 [19].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSG Id</td>
<td>M</td>
<td></td>
<td>BIT STRING (SIZE (27))</td>
<td></td>
</tr>
</tbody>
</table>
9.2.1.86 Subscriber Profile ID for RAT/Frequency priority

The Subscriber Profile ID IE for RAT/Frequency Selection Priority is used to define camp priorities in Idle mode and to control inter-RAT/inter-frequency handover in Active mode TS 23.401 [48].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscriber Profile ID for RAT/Frequency Priority</td>
<td>M</td>
<td></td>
<td>INTEGER</td>
<td>(1..256)</td>
</tr>
</tbody>
</table>

9.2.1.87 SRVCC operation possible

This information element is set by the CN to provide an indication that both UE and CN are SRVCC-capable.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRVCC operation possible</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(SRVCC possible,…),</td>
</tr>
</tbody>
</table>
9.2.1.91  UE Aggregate Maximum Bit Rate

The **UE Aggregate Maximum Bitrate** IE is applicable for all non-GBR bearers per UE which is defined for the Downlink and the Uplink direction and provided by the CN to the RNC. At least one of the **UE Aggregate Maximum Bit Rate Downlink** IE and **UE Aggregate Maximum Bit Rate Uplink** IE shall be included in the **UE Aggregate Maximum Bit Rate** IE.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE Aggregate Maximum Bit Rate</td>
<td></td>
<td></td>
<td></td>
<td>Desc: Applicable for non-GBR bearers</td>
</tr>
<tr>
<td>&gt;UE Aggregate Maximum Bit Rate Downlink</td>
<td>O</td>
<td>INTEGER (1..1,000,000,000)</td>
<td></td>
<td>Desc.: This IE indicates the aggregated maximum number of bits delivered by UTRAN and to UTRAN in DL within a period of time, divided by the duration of the period for all non-GBR bearers in one UE. The MBR of non-GBR bearers shall be ignored if this IE present.</td>
</tr>
<tr>
<td>&gt;UE Aggregate Maximum Bit Rate Uplink</td>
<td>O</td>
<td>INTEGER (1..1,000,000,000)</td>
<td></td>
<td>Desc.: This IE indicates the aggregated maximum number of bits delivered by UTRAN and to UTRAN in UL within a period of time, divided by the duration of the period for all non-GBR bearers in one UE. The MBR of non-GBR bearers shall be ignored if this IE present.</td>
</tr>
</tbody>
</table>

9.2.1.92  CSG Membership Status

This element indicates the Membership status of the UE to a particular CSG.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSG Membership Status</td>
<td>M</td>
<td></td>
<td>ENUMERATED (member, non-member,…)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.93  Cell Access Mode

This information element indicates that the cell operates in Hybrid Access mode as defined in TS 22.220 [56].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Access Mode</td>
<td>M</td>
<td></td>
<td>ENUMERATED (hybrid,…)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.94  Offload RAB Parameters

The purpose of the **Offload RAB parameters** IE is to provide information related to the handling of the SIPTO at Iu-PS function, as specified in TS 23.060 [21].
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Point Name</td>
<td>M</td>
<td></td>
<td>OCTET STRING (1..255)</td>
<td>This IE indicates the Access Point Name of the RAB to be offloaded. Defined in TS 23.003 [19].</td>
</tr>
<tr>
<td>Charging Characteristics</td>
<td>M</td>
<td></td>
<td>OCTET STRING (2)</td>
<td>This IE indicates the charging characteristics of the RAB to be offloaded. Defined in TS 29.060 [57].</td>
</tr>
</tbody>
</table>

### 9.2.1.95 MSISDN

The purpose of the MSISDN IE (TS 29.060 [57]) is to indicate the primary MSISDN of the subscriber for the handling of the SIPTO at Iu-PS function, as specified in TS 23.060 [21].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSISDN</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (1..9))</td>
<td>Coded as the MSISDN IE, as defined in TS 29.002 [24].</td>
</tr>
</tbody>
</table>

### 9.2.1.96 IRAT Measurement Configuration

The IRAT Measurement Configuration IE contains information for instructing the incoming UE to continue measuring the cells of the source RAT after a successful inter-system handover. It is used by the source RAT to specify the minimum radio quality and the period of time measurements should last for triggering a HO report for unnecessary HO to another RAT. A subset of source RAT frequencies to measure may be specified. The measurement bandwidth of a carrier frequency may also be specified in order to improve the measurement accuracy and reduce measurement time. The IRAT Measurement Configuration IE shall contain at least one of the RSRP or RSRQ thresholds. If only one of the thresholds is present, the target RAT will use the present threshold to compare against the measurement results received from the UE. HO Report should be sent if there is either a single source RAT cell whose measurement results exceed the threshold for the whole measurement duration, or a group of source RAT cells together provide such coverage. The cells that exceed the threshold in the first UE measurement report are included in the HO Report. If both thresholds are present, the received radio measurements must exceed both the RSRP and the RSRQ thresholds in order to satisfy the indicated radio conditions. No HO Report shall be sent in case no E-UTRAN cell could be included, or if the indicated period of time is interrupted by a new outgoing inter-RAT handover or by an intra-UMTS handover with SRNC relocation.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSRP</td>
<td>O</td>
<td></td>
<td>INTEGER (0..97)</td>
<td>Threshold of RSRP</td>
</tr>
<tr>
<td>RSRQ</td>
<td>O</td>
<td></td>
<td>INTEGER (0..34)</td>
<td>Threshold of RSRQ</td>
</tr>
<tr>
<td>IRAT Measurement Parameters</td>
<td>M</td>
<td></td>
<td>INTEGER (1..100)</td>
<td>The period of time following the successful IRAT handover, during which the target RAT instructs the UE to measure cells of the source RAT. Unit: [second]</td>
</tr>
<tr>
<td>&gt;Measurement Duration</td>
<td>M</td>
<td></td>
<td>INTEGER (1..100)</td>
<td>The period of time following the successful IRAT handover, during which the target RAT instructs the UE to measure cells of the source RAT. Unit: [second]</td>
</tr>
<tr>
<td>&gt;E-UTRA frequencies</td>
<td>&lt;maxnoofEUTRAFreqs&gt;</td>
<td>0</td>
<td>ENUMERATED(6,15,25,50,75,100)</td>
<td>If present, designates the specific E-UTRAN frequencies which the target RAT may instruct the UE to measure.</td>
</tr>
<tr>
<td>&gt;&gt;E-ARFCN</td>
<td>M</td>
<td></td>
<td>INTEGER (0..65535)</td>
<td>EARFCN of the downlink carrier frequency TS 36.101 [58].</td>
</tr>
<tr>
<td>&gt;&gt;Measurement Bandwidth</td>
<td>O</td>
<td></td>
<td>ENUMERATED(6,15,25,50,75,100)</td>
<td>Measurement bandwidth of the carrier frequency as defined in TS 25.331 [10].</td>
</tr>
<tr>
<td>Range bound</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxnoofEUTRAFreqs</td>
<td>Maximum no of EUTRA centre frequencies to measure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.2.1.97 MDT Configuration

The purpose of the *MDT Configuration* IE is to provide configuration information for the MDT function.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDT Activation</td>
<td>M</td>
<td></td>
<td>ENUMERATED(Immediate MDT only, Logged MDT only, Immediate MDT and Trace, ...</td>
<td></td>
</tr>
<tr>
<td>CHOICE MDT Area Scope</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Cell Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Cell ID List</td>
<td></td>
<td>1 to &lt;maxnoofCellID&gt;</td>
<td></td>
<td>This information element identifies a cell uniquely within UTRAN and consists of RNC-ID and C-ID as defined in TS 25.401 [3].</td>
</tr>
<tr>
<td>&gt;&gt;Cell-ID</td>
<td>M</td>
<td>INTEGER (0..268435455)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;LA Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;LAI List</td>
<td></td>
<td>1 to &lt;maxnoofLAIIs&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;RA Based</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;RAI List</td>
<td></td>
<td>0 to &lt;maxnoofRAIs&gt;</td>
<td></td>
<td>This element identifies an area in which the MDT Configuration applies.</td>
</tr>
<tr>
<td>&gt;&gt;RAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;PLMN Area Based</td>
<td></td>
<td>NULL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHOICE MDT mode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Immediate MDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Measurements to</td>
<td>M</td>
<td>BITSTRING (SIZE(8))</td>
<td></td>
<td>Each position in the bitmap indicates a MDT measurement, as defined in TS 37.320 [31]. First Bit = M1, Second Bit = M2, Third Bit = M3. Other bits are reserved for future use and are ignored if received. Value &quot;1&quot; indicates ‘activate’ and value &quot;0&quot; indicates ‘do not activate’.</td>
</tr>
<tr>
<td>Activate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;M1 Report</td>
<td>C-ifM1</td>
<td>9.2.1.98</td>
<td>M1: FDD only: CPICH RSCP and CPICH Ec/No measurement by UE</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;M2 Report</td>
<td>C-ifM2</td>
<td>9.2.1.99</td>
<td>M2: TDD only: P-CCPCH RSCP and Timeslot ISCP for UTRA 1.28 TDD</td>
<td></td>
</tr>
<tr>
<td>&gt;logged MDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;logging interval</td>
<td>M</td>
<td>ENUMERATED (1.28, 2.56, 5.12, 10.24, 20.48, 30.72, 40.96 and 61.44, ...)</td>
<td>The unit of this IE is second. This IE is defined in TS 25.331[10].</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;logging duration</td>
<td>M</td>
<td>ENUMERATED (10, 20, 40, 60, 90 and 120, ...)</td>
<td>The unit of this IE is minute. This IE is defined in TS 25.331[10].</td>
<td></td>
</tr>
<tr>
<td>Range bound</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxnoofCellID</td>
<td>Maximum no. of Cell ID subject for MDT scope. Value is 32.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxnoofLAIos</td>
<td>Maximum no. of LAI subject for MDT scope. Value is 8.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxnoofRAIs</td>
<td>Maximum no of RAI subject for MDT scope. Value is 8.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ifM1</td>
<td>This IE shall be present if the <em>Measurements to Activate</em> IE has the first bit set to '1'.</td>
</tr>
<tr>
<td>ifM2</td>
<td>This IE shall be present if the <em>Measurements to Activate</em> IE has the second bit set to '1'.</td>
</tr>
</tbody>
</table>

### 9.2.1.98 M1 Report

This IE defines the parameters for M1 report, FDD report of UE radio measurements as specified in TS 32.422 [38].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHOICE Report trigger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Periodic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;MDT Report Parameters</td>
<td>M</td>
<td>9.2.1.100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;event1F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Measurement quantity</td>
<td>M</td>
<td>ENUMERATED( CPICH Ec/N0, CPICH RSCP, pathloss, ...)</td>
<td>Range used depends on measurement quantity. CPICH RSCP -120...-25 dBm CPICH Ec/No -24..0 dB Pathloss 30..165dB</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;threshold</td>
<td>M</td>
<td>INTEGER(-120...165)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.99 M2 Report

This IE defines the parameters for a M2 report, TDD report of UE radio measurements as specified in TS 32.422 [38].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHOICE Report trigger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Periodic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;MDT Report Parameters</td>
<td>M</td>
<td>9.2.1.100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Event1I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;threshold</td>
<td>M</td>
<td>INTEGER(-120...-25)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.100 MDT Report parameters

This IE defines the report parameters for MDT periodic reports as specified in TS 32.422 [38].
9.2.1.101 RNSAP Relocation Parameters

This IE provides additional information for RNSAP Relocation.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB Parameters List</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.102</td>
</tr>
<tr>
<td>Location Reporting Transfer Information</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.105</td>
</tr>
<tr>
<td>Trace Information</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.106</td>
</tr>
<tr>
<td>Source SAI</td>
<td>O</td>
<td></td>
<td></td>
<td>SAI 9.2.3.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxnoofRABs</td>
<td>Maximum no. of RABs for one UE. Value is 256.</td>
</tr>
</tbody>
</table>

9.2.1.102 RAB Parameters List

This IE provides RAB specific information for RNSAP Relocation.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE Type and Reference</th>
<th>Semantics Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocation Parameters List</td>
<td></td>
<td>1 to &lt;maxnoof RABs&gt;</td>
<td></td>
<td>9.2.1.102</td>
</tr>
<tr>
<td>&gt;RAB ID</td>
<td>M</td>
<td></td>
<td></td>
<td>9.2.1.2</td>
</tr>
<tr>
<td>&gt;CN Domain Indicator</td>
<td>M</td>
<td></td>
<td></td>
<td>9.2.1.5</td>
</tr>
<tr>
<td>&gt;RAB Data Volume Report</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.103</td>
</tr>
<tr>
<td>&gt;UP Information</td>
<td>O</td>
<td></td>
<td></td>
<td>9.2.1.104</td>
</tr>
</tbody>
</table>

9.2.1.103 RAB Data Volume Report

This information element indicates the data volume (octets) and the time when it was counted that was unsuccessfully transmitted over the radio interface in the DL direction for a RAB.
### RAB Data Volume Report

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;RAB Data Volume Report Item IEs</td>
<td></td>
<td>1 to (&lt;\text{maxnoofVol}&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Unsuccessfully Transmitted DL Data Volume</td>
<td>M</td>
<td></td>
<td>Unsuccessfully transmitted data volume [9.2.3.12]</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Data Volume Reference</td>
<td>O</td>
<td></td>
<td>[9.2.3.13]</td>
<td></td>
</tr>
</tbody>
</table>

**Range bound** | **Explanation**
--- | ---
maxnoofVol | Maximum no. of reported data volume for one RAB. Value is 2.

### UP Information

Provides information to enable the UP operation to be continued from the target RNC.

<table>
<thead>
<tr>
<th>Information Element/Group name</th>
<th>Presence</th>
<th>Range</th>
<th>Type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame Sequence Number UL</td>
<td>M</td>
<td></td>
<td>Frame Sequence Number [9.2.1.107]</td>
<td></td>
</tr>
<tr>
<td>Frame Sequence Number DL</td>
<td>M</td>
<td></td>
<td>Frame Sequence Number [9.2.1.107]</td>
<td></td>
</tr>
<tr>
<td>PDU Type 14 Frame Sequence Number UL</td>
<td>M</td>
<td></td>
<td>PDU Type 14 Frame Sequence Number [9.2.1.108]</td>
<td></td>
</tr>
<tr>
<td>PDU Type 14 Frame Sequence Number DL</td>
<td>M</td>
<td></td>
<td>PDU Type 14 Frame Sequence Number [9.2.1.108]</td>
<td></td>
</tr>
<tr>
<td>Timing Difference UL-DL</td>
<td>O</td>
<td></td>
<td>OCTET STRING (1)</td>
<td>Coded as the Time Alignment IE in TS 25.415 [6]. Specifies the difference in time at the Source RNC between reception of the DL user data frame with the frame number indicated in the Frame Sequence Number DL IE and the transmission of the UL user data frame with the frame number indicated in the Frame Sequence Number UL IE.</td>
</tr>
<tr>
<td>Data PDU Type</td>
<td>M</td>
<td>ENUMERATED (PDU type 0, PDU type 1,...)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Range bound** | **Explanation**
--- | ---
maxnoofRFCIs | Maximum no. of RFCIs for one RAB. Value is 63.
maxnoofSubFlows | Maximum no. of Subflows for one RFCI. Value is 7.
9.2.1.105 Location Reporting Transfer Information

The Location Reporting Transfer Information IE contains information about location reporting function requested and started in the Source RNC. Only Request Types for periodic reporting and reporting upon change of Service Area are contained.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Change of Service Area Indicator</td>
<td>O</td>
<td>O</td>
<td>ENUMERATED (requested, ...)</td>
<td></td>
</tr>
<tr>
<td>Periodic Reporting Indicator</td>
<td>O</td>
<td>O</td>
<td>ENUMERATED (periodic SAI, periodic Geo, ...)</td>
<td></td>
</tr>
<tr>
<td>Direct Reporting Indicator</td>
<td>O</td>
<td>O</td>
<td>ENUMERATED (direct SAI, direct Geo, ...)</td>
<td></td>
</tr>
<tr>
<td>Vertical Accuracy Code</td>
<td>C-ifGeoRequested</td>
<td>C</td>
<td>9.2.1.46a</td>
<td></td>
</tr>
<tr>
<td>Positioning Priority Change SAI</td>
<td>C-ifChangeSAI</td>
<td>Positioning Priority</td>
<td>9.2.1.46c</td>
<td></td>
</tr>
<tr>
<td>Positioning Priority Direct</td>
<td>O</td>
<td>Positioning Priority</td>
<td>9.2.1.46c</td>
<td></td>
</tr>
<tr>
<td>Client Type Periodic</td>
<td>O</td>
<td>Client Type</td>
<td>9.2.1.46d</td>
<td></td>
</tr>
<tr>
<td>Client Type Direct</td>
<td>O</td>
<td>Client Type</td>
<td>9.2.1.46d</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>C-ifDirectGeo</td>
<td>C</td>
<td>9.2.1.46b</td>
<td></td>
</tr>
<tr>
<td>Include Velocity</td>
<td>O</td>
<td>O</td>
<td>9.2.1.81</td>
<td></td>
</tr>
<tr>
<td>Periodic Location Info</td>
<td>C-ifPeriodicGeo</td>
<td>C</td>
<td>9.2.1.82</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfGeoRequested</td>
<td>This IE shall be present if the Periodic Reporting Indicator IE is set to &quot;periodic Geo&quot; or if the Direct Reporting Indicator IE is set to &quot;direct Geo&quot;.</td>
</tr>
<tr>
<td>IfChangeSAI</td>
<td>This IE shall be present if the Periodic Reporting Indicator IE is set to &quot;periodic SAI&quot; or if the Direct Reporting Indicator IE is set to &quot;direct SAI&quot;.</td>
</tr>
<tr>
<td>IfPeriodicGeo</td>
<td>This IE shall be included if the Periodic Reporting Indicator IE is set to &quot;Geo Requested&quot;.</td>
</tr>
<tr>
<td>IfDirectGeo</td>
<td>This IE shall be present if the Direct Reporting Indicator IE is set to &quot;direct Geo&quot;.</td>
</tr>
</tbody>
</table>

9.2.1.106 Trace Information

The Trace Information contains information needed by the target RNC to maintain trace continuity.
### 9.2.1.107 Frame Sequence Number

The *Frame Sequence Number* IE is used for RNSAP Relocation and contains information needed by the target RNC to maintain continuity for numbering IuUP user data frames of PDU type 0 and 1 (see TS 25.415 [16]).

<table>
<thead>
<tr>
<th>Information Element/Group name</th>
<th>Presence</th>
<th>Range</th>
<th>Type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame Sequence Number</td>
<td></td>
<td></td>
<td>INTEGER(0..15)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.108 PDU Type 14 Frame Sequence Number

The *PDU Type 14 Frame Sequence Number* IE is used for RNSAP Relocation and contains information needed by the target RNC to maintain continuity for numbering IuUP user data frames of PDU type 14 (see TS 25.415 [16]).

<table>
<thead>
<tr>
<th>Information Element/Group name</th>
<th>Presence</th>
<th>Range</th>
<th>Type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDU Type 14 Frame Sequence Number</td>
<td></td>
<td></td>
<td>INTEGER(0..3)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.109 Priority Class Indicator

This information element indicates that overload has occurred and traffic for the indicated priority class should be reduced.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Class Indicator</td>
<td>M</td>
<td></td>
<td>BIT STRING(SIZE(8))</td>
<td>Each bit represents a priority class, as specified below. If a bit is set to '1', the signalling traffic of the respective priority class should be reduced. Bit (0) = Delay Tolerant traffic limited. Bits (1..7) reserved for future use.</td>
</tr>
</tbody>
</table>

### 9.2.1.110 Management Based MDT Allowed

This element indicates that the UE may perform management based MDT.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Based MDT Allowed</td>
<td></td>
<td></td>
<td>ENUMERATED (Allowed, ...)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.1.111 End Of CSFB

This element indicates that the Iu connection being released was established as a result of CS fallback.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Of CSFB</td>
<td></td>
<td></td>
<td>ENUMERATED</td>
<td>(end Of CSFB, ...)</td>
</tr>
</tbody>
</table>

### 9.2.2 Transport Network Layer Related IEs

#### 9.2.2.1 Transport Layer Address

For the PS domain, or for the CS domain in order to allow transport bearer establishment without ALCAP, this information element is an IP address to be used for the user plane transport. For the CS domain, in case of transport bearer establishment with ALCAP, this address is to be used for Transport Network Control Plane signalling to set up the transport bearer.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Layer Address</td>
<td>M</td>
<td></td>
<td>BIT STRING (1..160, ...)</td>
<td>The Radio Network Layer is not supposed to interpret the address information. It should pass it to the transport layer for interpretation. For details on the Transport Layer Address, see ref. TS 25.414 [9].</td>
</tr>
</tbody>
</table>

#### 9.2.2.2 Iu Transport Association

This element is used to associate the RAB and the corresponding transport bearer. For the CS domain this information element is either the Binding ID to be used in Transport Network Control Plane signalling during set up of the transport bearer or it contains the UDP port in order to allow transport bearer establishment without ALCAP. In PS domain this information element is the GTP Tunnel Endpoint Identifier.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice Iu Transport Association</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;TEID</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;GTP TEID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (4)</td>
<td>For details and range, see TS 29.281 [59]</td>
</tr>
<tr>
<td>&gt;Binding ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Binding ID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (4)</td>
<td>If the Binding ID includes an UDP port, the UDP port is included in octet 1 and 2. The first octet of the UDP port field shall be included in the first octet of the Binding ID.</td>
</tr>
</tbody>
</table>

#### 9.2.2.3 DL GTP-PDU Sequence Number

This IE indicates the sequence number of the GTP-PDU which is the next to be sent to the UE.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL GTP-PDU Sequence Number</td>
<td>M</td>
<td></td>
<td>INTEGER (0 ..65535)</td>
<td>This IE indicates the sequence number of the GTP-PDU which is next to be sent to the UE.</td>
</tr>
</tbody>
</table>
9.2.2.4 UL GTP-PDU Sequence Number

This IE indicates the sequence number of the GTP-PDU which is the next to be sent to the SGSN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL GTP-PDU Sequence Number</td>
<td>M</td>
<td></td>
<td>INTEGER (0..65535)</td>
<td>This IE indicates the sequence number of the GTP-PDU which is next to be sent to the SGSN.</td>
</tr>
</tbody>
</table>

9.2.2.5 Correlation ID

This IE contains the GTP Tunnel Endpoint Identifier or GRE key to be used for the user plane transport between RNC and the L-GW as specified in TS 23.401 [48].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation ID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (4)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3 NAS Related IEs

9.2.3.1 Permanent NAS UE Identity

This element is used to identify the UE commonly in the UTRAN and in the CN. The RNC uses it to find other existing signalling connections of the same UE (e.g. RRC or Iu signalling connections). It is an IMSI.

NOTE: IMSI is specified in TS 23.003 [19].

<table>
<thead>
<tr>
<th>Choice Permanent NAS UE Identity</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>
| >>IMSI                          |          |             | OCTET STRING (SIZE (3..8)) | - 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
- 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. |

9.2.3.2 Temporary UE ID

Temporary Mobile Subscriber Identity, used for security reasons to hide the identity of a subscriber.
### 9.2.3.3 Paging Cause

This element indicates the cause for paging a UE.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paging Cause</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>Terminating Conversational Call, Terminating Streaming Call, Terminating Interactive Call, Terminating Background Call, Terminating Low Priority Signalling, ..., Terminating High Priority Signalling</td>
</tr>
</tbody>
</table>

### 9.2.3.4 NAS Broadcast Information

Void

### 9.2.3.5 NAS PDU

This information element contains a CN – UE or UE – CN message that is transferred without interpretation in the RNC. Typically it contains call control, session management, supplementary services, short message service and mobility management messages.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS PDU</td>
<td>M</td>
<td></td>
<td>OCTET</td>
<td>STRING</td>
</tr>
</tbody>
</table>

### 9.2.3.6 LAI

This element is used to uniquely identify a Location Area.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
</table>
| PLMN identity | M        |       | OCTET STRING (SIZE (3)) | - digits 0 to 9, encoded 0000 to 1001,  
- 1111 used as filler digit,  
- two digits per octet,  
- bits 4 to 1 of octet n encoding digit 2n-1  
- bits 8 to 5 of octet n encoding digit 2n  
- The PLMN identity consists of 3 digits from MCC followed by either  
- a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or  
- 3 digits from MNC (in case of a 3 digit MNC). |

| LAC | M | OCTET STRING (2) | 0000 and FFFE not allowed. |

9.2.3.7 RAC

This element is used to identify a Routing Area within a Location Area. It is used for PS services.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAC</td>
<td>M</td>
<td></td>
<td>OCTET STRING (1)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.8 SAPI

The SAPI IE is used to indicate the specific service to provide for the included NAS message.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAPI</td>
<td>M</td>
<td></td>
<td>ENUMERATED (SAPI 0, SAPI 3, ...)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.9 SAI

The SAI IE (Service Area Identifier) (see ref. TS 25.401 [3]) is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN. For this protocol, only a Service Area that is defined to be applicable to both the PS and the CS domains shall be used.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n - The PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
<tr>
<td>LAC</td>
<td>M</td>
<td></td>
<td>OCTET STRING (2)</td>
<td>0000 and FFFE not allowed.</td>
</tr>
<tr>
<td>SAC</td>
<td>M</td>
<td></td>
<td>OCTET STRING (2)</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.3.10 Area Identity

This information element is used for indicating the location of a UE and is either a Service Area or a Geographical Area.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area Identity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;SAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;SAI</td>
<td>M</td>
<td></td>
<td>9.2.3.9</td>
<td></td>
</tr>
<tr>
<td>&gt;Geo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Geographical Area</td>
<td>M</td>
<td></td>
<td>9.2.3.11</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.3.11 Geographical Area

The Geographical Area IE is used to identify an area using geographical coordinates. The reference system is the same as the one used in TS 23.032 [20].
### Geographical Area

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Point</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Point</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid point</td>
<td></td>
</tr>
<tr>
<td>&gt;Point With Uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Point With Uncertainty</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid point with uncertainty</td>
<td></td>
</tr>
<tr>
<td>&gt;Polygon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Polygon</td>
<td>M</td>
<td>See below</td>
<td>List of Ellipsoid points</td>
<td></td>
</tr>
<tr>
<td>&gt;Ellipsoid point with uncertainty Ellipse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Ellipsoid point with uncertainty Ellipse</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid point with uncertainty Ellipse</td>
<td></td>
</tr>
<tr>
<td>&gt;Ellipsoid point with altitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Ellipsoid point with altitude</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid point with altitude</td>
<td></td>
</tr>
<tr>
<td>&gt;Ellipsoid point with altitude and uncertainty Ellipsoid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Ellipsoid point with altitude and uncertainty Ellipsoid</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid point with altitude and uncertainty Ellipsoid</td>
<td></td>
</tr>
<tr>
<td>&gt;Ellipsoid Arc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Ellipsoid Arc</td>
<td>M</td>
<td>See below</td>
<td>Ellipsoid Arc</td>
<td></td>
</tr>
</tbody>
</table>

### Point

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Point With Uncertainty

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Uncertainty Code</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td>The uncertainty “r” is derived from the “uncertainty code” k by r = 10x(1.1k-1)</td>
<td></td>
</tr>
</tbody>
</table>

### Polygon

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>1 to &lt;maxnoofPoints&gt;</td>
<td>See below</td>
<td></td>
</tr>
</tbody>
</table>

### Range bound

<table>
<thead>
<tr>
<th>maxnoofPoints</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum no. of points in polygon. Value is 15.</td>
</tr>
</tbody>
</table>

### Ellipsoid point with uncertainty Ellipse

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Uncertainty Ellipse</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Confidence</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Ellipsoid point with altitude

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Altitude and direction</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ellipsoid point with altitude and uncertainty

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Altitude and direction</td>
<td>M</td>
<td>See below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Uncertainty Ellipse</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Uncertainty Altitude</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Confidence</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ellipsoid Arc

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Geographical Coordinates</td>
<td>M</td>
<td>See below</td>
<td>INTEGER (0..2^{16}-1)</td>
<td>The relation between the value (N) and the radius (r) in meters it describes is 5N ≤ r &lt; 5(N+1), except for N=2^{16}-1 for which the range is extended to include all greater values of (r).</td>
</tr>
<tr>
<td>&gt;Inner radius</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td>The uncertainty &quot;r&quot; is derived from the &quot;uncertainty code&quot; k by r = 10x(1.1k-1)</td>
</tr>
<tr>
<td>&gt;Uncertainty radius</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Offset angle</td>
<td>M</td>
<td>INTEGER (0..179)</td>
<td></td>
<td>The relation between the value (N) and the angle (a) in degrees it describes is 2N ≤ a &lt; 2(N+1)</td>
</tr>
<tr>
<td>&gt;Included angle</td>
<td>M</td>
<td>INTEGER (0..179)</td>
<td></td>
<td>The relation between the value (N) and the angle (a) in degrees it describes is 2N &lt; a ≤ 2(N+1)</td>
</tr>
<tr>
<td>&gt;Confidence</td>
<td>M</td>
<td>INTEGER (0..127)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IE/Group Name</td>
<td>Presence</td>
<td>Range</td>
<td>IE type and reference</td>
<td>Semantics description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Geographical Coordinates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Latitude Sign</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(North, South)</td>
</tr>
<tr>
<td>&gt;Degrees Of Latitude</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{23}-1)</td>
<td>The IE value (N) is derived by this formula: N ≤ 2^{23} X /90 &lt; N+1 X being the latitude in degree (0°.. 90°)</td>
</tr>
<tr>
<td>&gt;Degrees Of Longitude</td>
<td>M</td>
<td></td>
<td>INTEGER (2^{23}..2^{23}-1)</td>
<td>The IE value (N) is derived by this formula: N ≤ 2^{24} X /360 &lt; N+1 X being the longitude in degree (-180°..+180°)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncertainty Ellipse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Uncertainty semi-major</td>
<td>M</td>
<td></td>
<td>INTEGER (0..127)</td>
<td>The uncertainty “r” is derived from the “uncertainty code” k by r = 10x(1.1k-1)</td>
</tr>
<tr>
<td>&gt;Uncertainty semi-minor</td>
<td>M</td>
<td></td>
<td>INTEGER (0..127)</td>
<td>The uncertainty “r” is derived from the “uncertainty code” k by r = 10x(1.1k-1)</td>
</tr>
<tr>
<td>&gt;Orientation of major axis</td>
<td>M</td>
<td></td>
<td>INTEGER (0..179)</td>
<td>The relation between the IE value (N) and the angle (a) in degrees it describes is 2N ≤ a &lt; 2(N+1). The values 90..179 shall not be used.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altitude and direction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Direction of Altitude</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(Height, Depth)</td>
</tr>
<tr>
<td>&gt;Altitude</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{15}-1)</td>
<td>The relation between the value (N) and the altitude (a) in meters it describes is N ≤ a &lt; N+1, except for N = 2^{15}-1 for which the range is extended to include all greater values of (a).</td>
</tr>
</tbody>
</table>

### 9.2.3.12 Unsuccessfully Transmitted Data Volume

This information element indicates the data volume (octets) that is unsuccessfully transmitted over the radio interface in the DL direction for a given RAB.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuccessfully Transmitted Data Volume</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{32}-1)</td>
<td>Unit is octet.</td>
</tr>
</tbody>
</table>
9.2.3.13  Data Volume Reference

This information element indicates the time when the data volume is counted. It is an operator/vendor specific matter to assign meanings for the different integer values.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Volume Reference</td>
<td>M</td>
<td>INTEGER (0..255)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.14  Information Identity

Void

9.2.3.15  Information Priority

Void

9.2.3.16  Information Control

Void

9.2.3.17  CN Broadcast Area

Void

9.2.3.18  NAS Synchronisation Indicator

This information element contains transparent NAS information that is transferred without interpretation in the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS Synchronisation Indicator</td>
<td>M</td>
<td>BIT STRING (4)</td>
<td></td>
<td>The coding of this IE, transparent for RNC, is described in the subclause “Speech Codec Selection” of TS 24.008 [8].</td>
</tr>
</tbody>
</table>

9.2.3.19  Location Related Data Request Type

This element indicates the type of the requested location related data for the indicated positioning method, and provides the assistance data for the Assisted GPS positioning method.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested Location Related Data Type</td>
<td>M</td>
<td></td>
<td>ENUMERATED( Deciphering Keys for UE Based OTDOA, Deciphering Keys for Assisted GPS, Dedicated Assistance Data for UE Based OTDOA, Dedicated Assistance Data for Assisted GPS, …, Deciphering keys for Assisted GANSS, Dedicated Assistance Data for Assisted GANSS, Deciphering keys for Assisted GPS and GANSS, Dedicated Assistance Data for Assisted GPS and GANSS )</td>
<td></td>
</tr>
<tr>
<td>Requested GPS Assistance Data</td>
<td>C – ifDedAssGPS</td>
<td></td>
<td>9.2.3.21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ifDedAssGPS</td>
<td>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”.</td>
</tr>
</tbody>
</table>

**9.2.3.20 Broadcast Assistance Data Deciphering keys**

This information element is used for indicating the deciphering keys that will be used by the UE for deciphering of broadcast assistance data.
### 9.2.3.21 Requested GPS Assistance Data

This information element is used for indicating the requested GPS assistance data.

This IE is transparent to CN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested GPS Assistance Data</td>
<td></td>
<td></td>
<td>OCTET STRING</td>
<td>For the corresponding Information Element Definition see &quot;gpsAssistanceData&quot; TS 24.080 [22].</td>
</tr>
</tbody>
</table>

### 9.2.3.22 Last Known Service Area

This information element is used for indicating the last known Service Area and the elapsed time since the UE was known to be in this Service Area. The last known Service Area is reported when the current Service Area is unknown to the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAI</td>
<td>M</td>
<td></td>
<td>INTEGER (0..32767)</td>
<td>The value represents the elapsed time in minutes since the reported last known SAI was stored by the RNC. Value &quot;0&quot; shall not be used. Value &quot;32767&quot; indicates that the age of SAI is at least 32767 minutes old.</td>
</tr>
<tr>
<td>Age of SAI</td>
<td>M</td>
<td></td>
<td>INTEGER (0..32767)</td>
<td>The value represents the elapsed time in minutes since the reported last known SAI was stored by the RNC. Value &quot;0&quot; shall not be used. Value &quot;32767&quot; indicates that the age of SAI is at least 32767 minutes old.</td>
</tr>
</tbody>
</table>

### 9.2.3.23 Shared Network Information

For each LA contained in this IE, it provides the SNA(s) the LA belongs to.
## 9.2.3.24 SNA Access Information

Provides information on the area(s) in the PLMN(s) the UE is authorised to access.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorised PLMNs</td>
<td></td>
<td>1 to &lt;maxPLMNsSN&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
<tr>
<td>&gt;Authorised SNAs List</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Authorised SNAs</td>
<td></td>
<td>1 to &lt;maxSNAs&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;SNAC</td>
<td>M</td>
<td></td>
<td>9.2.3.25</td>
<td></td>
</tr>
</tbody>
</table>
9.2.3.25 SNAC

Indicates the Identity of an SNA according to TS 23.003 [19].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAC</td>
<td>M</td>
<td></td>
<td>INTEGER (0..65535)</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.26 Location Related Data Request Type Specific To GERAN Iu Mode

This element indicates the type of the requested location related data for the indicated specific positioning method supported only within GERAN Iu mode.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Related Data Request Type Specific To GERAN Iu mode</td>
<td></td>
<td></td>
<td>ENUMERATED( Deciphering Keys for E-OTD, Dedicated Mobile-Assisted E-OTD Assistance Data, Dedicated Mobile-Based E-OTD Assistance Data, ... )</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.27 Position Data

This IE provides data related to the positioning methods in relation with the Location Report procedure.
### Positioning Data Discriminator

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning Data</td>
<td>M</td>
<td>BIT STRING (4)</td>
<td>The positioning data discriminator defines the type of data provided for each positioning method: 0000 indicates the presence of the <em>Positioning Data Set</em> IE (that reports the usage of each non-GNSS method that was successfully used to obtain the location estimate) 0001 indicates the presence of the <em>GNSS Positioning Data Set</em> IE (that reports the usage of each GNSS method that was successfully used to obtain the location estimate) and the absence of the <em>Positioning Data Set</em> IE 1 octet of data is provided for each positioning method included. All other values are reserved.</td>
<td>--</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Positioning Data Set

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Positioning Method and Usage</td>
<td>C-ifDiscrimin ator=0</td>
<td>OCTET STRING (1)</td>
<td>Coding of positioning method (bits 8-4): 00000 Reserved (NOTE) 00001 Reserved (NOTE) 00010 Reserved (NOTE) 00011 Reserved (NOTE) 00100 Reserved (NOTE) 00101 Mobile Assisted GPS 00110 Mobile Based GPS 00111 Conventional GPS 01000 U-TDOA 01001 OTDOA 01010 IPDL 01011 RTT 01100 Cell ID 01101 to 01111 reserved for other location technologies 10000 to 11111 reserved for network specific positioning methods Coding of usage (bits 3-1): 000 Attempted unsuccessfully due to failure or interruption - not used. 001 Attempted</td>
<td>--</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>GANSS Positioning Data Set</td>
<td>O</td>
<td>YES</td>
<td>ignore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---</td>
<td>-----</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;GANSS Positioning Method and Usage</td>
<td>1 to &lt;maxGANSSSet&gt; OCTET STRING (1)</td>
<td>Coding of positioning method (bits 8-7): 00: MS-Based 01: MS-Assisted 10: Conventional 11: Reserved Coding of GANSS ID (bits 6-4): 000: Galileo 001: SBAS 010: Modernized GPS 011: QZSS 100: GLONASS other values reserved Coding of usage (bits 3-1): 011 Attempted successfully: results used to generate location 100 Attempted successfully: case where MS supports multiple mobile based positioning methods and the actual method or methods used by the MS cannot be determined.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-ifDiscriminator=0</td>
<td>This IE is present if the Positioning Data Discriminator IE is set to &quot;0000&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range bound</td>
<td>Explanation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxSet</td>
<td>Maximum size of the data set. Value is 9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maxGANSSSet</td>
<td>Maximum size of the data. Value is 9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.2.3.28  Position Data Specific To GERAN Iu Mode

This IE provides data related to the positioning methods which are supported only within GERAN Iu mode in relation with the Location Report procedure. The coding of this element is described in TS 49.031 [34].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position Data Specific To GERAN Iu Mode</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the value part of the Positioning Data IE or GANSS Positioning Data IE defined in TS 49.031 [34].</td>
</tr>
</tbody>
</table>

9.2.3.29  Accuracy Fulfilment Indicator

This IE indicates whether the returned position estimate satisfies the requested accuracy or not.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy Fulfilment Indicator</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(requested accuracy fulfilled, requested accuracy not fulfilled, ...)</td>
</tr>
</tbody>
</table>

9.2.3.30  RIM Transfer

This IE contains the RIM Information (e.g. NACC information) and additionally in uplink transfer the RIM routing address of the destination of this RIM information.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIM Information</td>
<td>M</td>
<td></td>
<td>9.2.3.31</td>
<td></td>
</tr>
<tr>
<td>RIM Routing Address</td>
<td>O</td>
<td></td>
<td>9.2.3.32</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.31  RIM Information

This IE contains the RIM Information (e.g. NACC information) i.e. the BSSGP RIM PDU from the RIM application part contained in the RNC, or the BSSGP RIM PDU to be forwarded to the RIM application part in the RNC.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIM Information</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Contains the BSSGP RIM PDU as defined in ref TS 48.018 [36].</td>
</tr>
</tbody>
</table>

9.2.3.32  RIM Routing Address

This IE identifies the destination node where the RIM Information needs to be routed by the CN.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice RIM Routing Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Target RNC-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Target RNC-ID</td>
<td>M</td>
<td></td>
<td></td>
<td>Applicable to GERAN lu mode, not applicable to UTRAN</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>O</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;RNC-ID</td>
<td>M</td>
<td>INTEGER (0..4095)</td>
<td>If the Extended RNC-ID IE is included in the Target RNC-ID IE, the RNC-ID IE shall be ignored.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;Extended RNC-ID</td>
<td>O</td>
<td>9.2.1.39a</td>
<td>The Extended RNC-ID IE shall be used if the RNC identity has a value larger than 4095.</td>
<td>YES</td>
<td>reject</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;GERAN-Cell-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;GERAN-Cell-ID</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;RAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;CI</td>
<td>M</td>
<td>OCTET STRING (2)</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;Target eNB-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;Target eNB-ID</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;PLMN identity</td>
<td>M</td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n - The PLMN identity consists of 3 digits from MCC followed by either -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;CHOICE eNB ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;Macro eNB ID</td>
<td></td>
<td>BIT STRING (20)</td>
<td>Equal to the 20 leftmost bits of the Cell Identity IE contained in the E-UTRAN CGI IE (see TS 36.413 [49]) of each cell served by the eNodeB.</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;Home eNB ID</td>
<td></td>
<td>BIT STRING (28)</td>
<td>Equal to the Cell Identity IE contained in the E-UTRAN CGI IE (see</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
9.2.3.33   Selected PLMN Identity

This information element indicates the selected core network operator in shared networks.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n - The Selected PLMN identity consists of 3 digits from MCC followed by either - a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or - 3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
</tbody>
</table>

9.2.3.34   NAS Sequence Number

This IE is transparent for UTRAN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAS Sequence Number</td>
<td>M</td>
<td></td>
<td>BIT STRING</td>
<td>Contains the value of the N(SD) as defined in TS 24.008 [8].</td>
</tr>
</tbody>
</table>

9.2.3.35   Redirection Completed

This IE indicates to RNC that the redirection is completed.

Direction: CN → RNC

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redirection Completed</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>redirection completed, …</td>
</tr>
</tbody>
</table>
9.2.3.36    Redirection Indication

This IE is used by a CN to request rerouting by the RNC to another CN operator. It is only used in MOCN configuration for network sharing non-supporting UEs.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial NAS-PDU</td>
<td>M</td>
<td></td>
<td>9.2.3.5</td>
<td>The initial NAS-PDU received from UE</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Reject Cause Value</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>This IE lists cause values which meaning is defined in TS 24.008 [8] with the exception of &quot;CS/PS coordination required&quot; that will never be forwarded to the UE.</td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>NAS Sequence Number</td>
<td>O</td>
<td></td>
<td>9.2.3.34</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
<tr>
<td>Permanent NAS UE Identity</td>
<td>O</td>
<td></td>
<td>9.2.3.1</td>
<td></td>
<td>YES</td>
<td>ignore</td>
</tr>
</tbody>
</table>

9.2.3.37    TMGI

The TMGI uniquely identifies the MBMS Bearer Service.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLMN identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>- digits 0 to 9, encoded 0000 to 1001,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- 1111 used as filler digit, two digits per octet,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- bits 4 to 1 of octet n encoding digit 2n-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- bits 8 to 5 of octet n encoding digit 2n</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- The PLMN identity consists of 3 digits from MCC followed by either</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- 3 digits from MNC (in case of a 3 digit MNC).</td>
</tr>
<tr>
<td>Service ID</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td></td>
</tr>
</tbody>
</table>

9.2.3.38    MBMS Session Identity

The MBMS Session Identity identifies the session of a MBMS Bearer Service in UTRAN and is used by the UE to recognise repetitions of a session.

This IE is transparent to RAN.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Session Identity</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (1))</td>
<td>Coded as the MBMS Session Identity IE, as defined in TS 29.061 [44].</td>
</tr>
</tbody>
</table>

### 9.2.3.39 MBMS Bearer Service Type
Indicates the type of the MBMS Bearer Service.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Bearer Service Type</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(multicast, broadcast, ...)</td>
</tr>
</tbody>
</table>

### 9.2.3.39a MBMS Counting Information
Indicates to the RNC whether MBMS Counting procedures can be applied in MBMS Broadcast Mode.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Counting Information</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>(counting, not counting, ...)</td>
</tr>
</tbody>
</table>

### 9.2.3.40 MBMS Session Duration
This IE defines the duration of the MBMS Session.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Session Duration</td>
<td>M</td>
<td></td>
<td>OCTET STRING (SIZE (3))</td>
<td>Coded as the value part of MBMS-Session-Duration AVP as defined in TS 29.061 [44].</td>
</tr>
</tbody>
</table>

### 9.2.3.41 MBMS Service Area
The MBMS Service Area IE consists of a list of one or several MBMS Service Area Identities where each MBMS Service Area Identity is frequency agnostic and can be mapped onto one or more cells.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Service Area</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Value part coded per MBMS Service Area AVP as defined in TS 29.061 [44].</td>
</tr>
</tbody>
</table>

### 9.2.3.42 RA List of Idle Mode UEs
Indicates the list of RAs where idle-mode UEs interested in a given Multicast Service are.
### Choice RA List of Idle Mode UEs

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Not Empty RA List of Idle Mode UEs</td>
<td></td>
<td></td>
<td></td>
<td>The same RAC+LAI combination must only be present once.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; RA of Idle Mode UEs</td>
<td></td>
<td>1 to</td>
<td>&lt;maxMB MSRA&gt;</td>
<td>Each RAC in this list gives a valid RAI only if combined with an LAI of the same index contained in the LA of Idle Mode UEs IE.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; RAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; LA List of Idle Mode UEs</td>
<td>C-</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;&gt;&gt; LA of Idle Mode UEs</td>
<td></td>
<td>1 to</td>
<td>&lt;maxMB MSRA&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;&gt;&gt; LAI</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt; Empty/Full RA List of Idle Mode UEs</td>
<td></td>
<td></td>
<td>ENUMERATED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt; Empty/Full RA List of Idle Mode UEs</td>
<td></td>
<td></td>
<td>(emptylist, fulllist,...)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Range bound**

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxMBMSRA</td>
<td>Maximum no. of Routing Areas where idle-mode UEs interested in a given Multicast Service are. The value for maxMBMSRA is 65536.</td>
</tr>
</tbody>
</table>

**Condition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfRAofIdleModeUEs</td>
<td>This IE shall be present if the RA of Idle Mode UEs IE is included.</td>
</tr>
</tbody>
</table>

#### 9.2.3.43 Delta RA List of Idle Mode UEs

Indicates the list of new RAs where idle-mode UEs interested in a given Multicast Service became or moved to, as well as the list of RAs where there is no interested idle-mode UEs in a given Multicast Service any longer.
### Delta RA List of Idle Mode UEs

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>New RA List of Idle Mode UEs</td>
<td>O</td>
<td></td>
<td></td>
<td>The same RAC+LAI combination must only be present once.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>New RA of Idle Mode UEs

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>New RA of Idle Mode UEs</td>
<td>O</td>
<td>1 to &lt;maxMB MSRA&gt;</td>
<td>Each RAC in this list gives a valid RAI only if combined with an LAI of the same index contained in the LA of Idle Mode UEs IE.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>>RAC

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >RA List with No Idle Mode UEs Any More

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA List with No Idle Mode UEs Any More</td>
<td>O</td>
<td>1 to &lt;maxMB MSRA&gt;</td>
<td>Each RAC in this list gives a valid RAI only if combined with an LAI of the same index contained in the LA of Idle Mode UEs IE.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>>RAC

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAC</td>
<td>M</td>
<td>9.2.3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >New LA List of Idle Mode UEs

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>New LA List of Idle Mode UEs</td>
<td>C-IfNewRAList ofIdleModeUEs</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>New LA of Idle Mode UEs

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>New LA of Idle Mode UEs</td>
<td>C-IfRAListWithNoIdleModeUEsAnyMore</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>>LA

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>LA with No Idle Mode UEs Any More

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA with No Idle Mode UEs Any More</td>
<td>C-IfRAListWithNoIdleModeUEsAnyMore</td>
<td>YES reject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### >>>LA

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>M</td>
<td>9.2.3.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Range bound

<table>
<thead>
<tr>
<th>Range bound</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxMBMSRA</td>
<td>Maximum no. of Routing Areas where idle-mode UEs interested in a given Multicast Service are. The value for maxMBMSRA is 65536.</td>
</tr>
</tbody>
</table>

### Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IfNewRAList of Idle Mode UEs</td>
<td>This IE shall be present if the New RA List of Idle Mode UEs IE is included.</td>
</tr>
<tr>
<td>IfRAListWithNoIdleModeUEs Any More</td>
<td>This IE shall be present if the RA List with No Idle Mode UEs Any More IE is included.</td>
</tr>
</tbody>
</table>

### 9.2.3.44 MBMS CN De-Registration

Indicates whether the MBMS Session Stop procedure is a normal Session Stop or a total de-registration for a given MBMS Bearer Service.
### 9.2.3.45 MBMS Registration Request Type

Indicates the type of the MBMS Registration Request.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Registration Request Type</td>
<td>M</td>
<td></td>
<td>ENUMERATED</td>
<td>ED(normal session stop, deregister, ...)</td>
</tr>
</tbody>
</table>

### 9.2.3.46 Requested MBMS IP Multicast Address and APN

Informs the RNC about the requested pairs of IP Multicast Address and APN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS IP Multicast Address and APN list</td>
<td></td>
<td>1 to &lt;maxnoofMulticastServicesPerRNC&gt;</td>
<td>OCTET STRING (4..16)</td>
<td>Transparent information to RAN. Octet string size 4 represents IPv4 address. Octet string size 16 represents IPv6 address.</td>
</tr>
<tr>
<td>&gt;TMGI</td>
<td>M</td>
<td></td>
<td></td>
<td>9.2.3.37</td>
</tr>
<tr>
<td>&gt;IP Multicast Address</td>
<td>M</td>
<td></td>
<td>OCTET STRING (1..255)</td>
<td>Transparency information to RAN.</td>
</tr>
<tr>
<td>&gt;APN</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Range bound

| maxnoofMulticastServicesPerRNC       | Maximum no. of Multicast Services that a RNC can have context for. Value is 512. |

### 9.2.3.47 Requested Multicast Service List

Informs the RNC about the requested Multicast Service list for a particular UE.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMGI</td>
<td>M</td>
<td>1 to &lt;maxnoofMulticastServicesJoinedPerUE&gt;</td>
<td>9.2.3.37</td>
<td>The same TMGI must only be present once.</td>
</tr>
</tbody>
</table>
### 9.2.3.48 MBMS Session Repetition Number

Informs the RNC about the repetitions of a particular session of a MBMS Bearer Service.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBMS Session Repetition Number</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the value part of MBMS-Session - Repetition-Number AVP as defined in TS 29.061 [44].</td>
</tr>
</tbody>
</table>

### 9.2.3.49 Time to MBMS Data Transfer

This IE denotes the time occurring between the transmission of the MBMS SESSION START message to the RNS and the actual start of the data transfer. The coding of this element is described in TS 48.018 [36].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to MBMS Data Transfer</td>
<td>M</td>
<td></td>
<td>OCTET STRING</td>
<td>Coded as the value part of Time to MBMS Data Transfer IE defined in TS 48.018 [36].</td>
</tr>
</tbody>
</table>

### 9.2.3.50 Redirect Attempt Flag

This IE indicates that the CN should respond with a Redirection Indication IE or a Redirection completed IE.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redirect Attempt Flag</td>
<td>M</td>
<td></td>
<td>NULL</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.3.51 Velocity Estimate

The Velocity Estimate IE is used to describe the UE’s velocity. The reference system is the same as used in TS 23.032 [20].
### 3GPP TS 25.413 version 10.5.0

#### IE/Group Name | Presence | Range | IE type and reference | Semantics description
--- | --- | --- | --- | ---
Choice Velocity Estimate

> Horizontal Velocity

  >> Horizontal Velocity

  M | See below | Horizontal speed and bearing (the direction of travel).

> Horizontal with Vertical Velocity

  >> Horizontal with Vertical Velocity

  M | See below | Horizontal speed, bearing (the direction of travel), and vertical speed

> Horizontal Velocity with Uncertainty

  >> Horizontal Velocity with Uncertainty

  M | See below | Horizontal speed, bearing (the direction of travel), and the uncertainty of the reported speed.

> Horizontal with Vertical Velocity and Uncertainty

  >> Horizontal with Vertical Velocity and Uncertainty

  M | See below | Horizontal speed, bearing (the direction of travel), vertical speed and the uncertainty of the reported speed.

### IE/Group Name | Presence | Range | IE type and reference | Semantics description
--- | --- | --- | --- | ---
Horizontal Velocity

> Horizontal Speed and Bearing

  M | See below | Horizontal speed and bearing (the direction of travel).

### IE/Group Name | Presence | Range | IE type and reference | Semantics description
--- | --- | --- | --- | ---
Horizontal with Vertical Velocity

> Horizontal Speed and Bearing

  M | See below | Horizontal speed and bearing (the direction of travel).

> Vertical Velocity

  M | See below | Vertical velocity.

### IE/Group Name | Presence | Range | IE type and reference | Semantics description
--- | --- | --- | --- | ---
Horizontal Velocity with Uncertainty

> Horizontal Speed and Bearing

  M | See below | Horizontal speed and bearing (the direction of travel).

>> Uncertainty Speed

  M | INTEGER (0..255) | Uncertainty speed is encoded in increments of 1 kilometer per hour using an 8 bit binary coded number (N). The value of N gives the uncertainty speed except for N=255 which indicates that the uncertainty is not specified.
<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal with Vertical Velocity and Uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Horizontal Speed and Bearing</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Vertical Velocity</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Horizontal Uncertainty Speed</td>
<td>M</td>
<td>INTEGER (0..255)</td>
<td>Horizontal Uncertainty Speed is encoded in increments of 1 kilometer per hour using an 8 bit binary coded number (N). The value of N gives the uncertainty speed except for N=255 which indicates that the uncertainty is not specified</td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;Vertical Uncertainty Speed</td>
<td>M</td>
<td>INTEGER (0..255)</td>
<td>Vertical Uncertainty speed is encoded in increments of 1 kilometer per hour using an 8 bit binary coded number (N). The value of N gives the uncertainty speed except for N=255 which indicates that the uncertainty is not specified</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Speed and Bearing</td>
<td></td>
<td></td>
<td>INTEGER (0..359)</td>
<td>The direction of movement is given in degrees where &quot;0&quot; represents North, &quot;90&quot; represents East, etc.</td>
</tr>
<tr>
<td>&gt;Bearing</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{11}-1)</td>
<td>The relationship between (N) and the horizontal speed (h) in kilometers per hour it describes is:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N ≤ h &lt; N + 0.5  (N=0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N – 0.5 ≤ h &lt; N + 0.5  (0&lt;N&lt;2^{11}-1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N – 0.5 ≤ h  (N = 2^{11}-1)</td>
</tr>
<tr>
<td>&gt;Horizontal Speed</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{9}-1)</td>
<td>The relationship between (N) and the vertical speed (v) in kilometers per hour it describes is:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N ≤ v &lt; N + 0.5  (N = 0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N – 0.5 ≤ v &lt; N + 0.5  (0 &lt; N &lt; 2^{8}-1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N – 0.5 ≤ v  (N = 2^{8}-1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Velocity</td>
<td></td>
<td></td>
<td>INTEGER (0..2^{8}-1)</td>
<td>The relationship between (N) and the vertical speed (v) in kilometers per hour it describes is:</td>
</tr>
<tr>
<td>&gt;Vertical Speed</td>
<td>M</td>
<td></td>
<td>INTEGER (0..2^{8}-1)</td>
<td>The relationship between (N) and the vertical speed (v) in kilometers per hour it describes is:</td>
</tr>
<tr>
<td>&gt;Vertical Speed Direction</td>
<td>M</td>
<td></td>
<td>ENUMERATED (upward, downward)</td>
<td>The relationship between (N) and the vertical speed (v) in kilometers per hour it describes is:</td>
</tr>
</tbody>
</table>
9.2.3.52   RAT Type
Indicates the RAT from which the context request originates.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAT Type</td>
<td>O</td>
<td></td>
<td>ENUMERATED(UTRAN, GERAN, ...)</td>
<td>GERAN means GERAN Gb mode. UTRAN means UTRAN but may also include GERAN Iu mode.</td>
</tr>
</tbody>
</table>

9.2.3.53   Requested GANSS Assistance Data
This information element is used for indicating the requested GANSS assistance data.
This IE is transparent to CN.

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested GANSS Assistance Data</td>
<td></td>
<td></td>
<td>OCTET STRING (SIZE(1..201))</td>
<td>For the corresponding Information Element Definition see &quot;ganssAssistanceData&quot; TS 24.080 [22].</td>
</tr>
</tbody>
</table>

9.2.3.54   Higher bitrates than 16 Mbps flag
This information element indicates whether the UE is capable of handling NAS QoS extensions introduced in Rel-7, or not. See also TS 23.060 [21].

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher bitrates than 16 Mbps flag</td>
<td></td>
<td></td>
<td>ENUMERATED (allowed, not-allowed, ...)</td>
<td></td>
</tr>
</tbody>
</table>
9.3 Message and Information Element Abstract Syntax (with ASN.1)

9.3.0 General

RANAP ASN.1 definition conforms with ITU-T Rec. X.680 [14] and ITU-T Rec. X.681 [15].

The ASN.1 definition specifies the structure and content of RANAP messages. RANAP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct a RANAP message according to the PDU definitions module and with the following additional rules:

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions.
- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e. an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

NOTE: 'IE' means an IE in the object set with an explicit id. If one IE needed to appear more than once in one object set, then the different occurrences have different IE IDs.

If a RANAP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax Error in subclause 10.3.6.

Subclause 9.3 presents the Abstract Syntax of RANAP protocol with ASN.1. In case there is contradiction between the ASN.1 definition in this subclause and the tabular format in subclause 9.1 and 9.2, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional elements, where the tabular format shall take precedence.

9.3.1 Usage of private message mechanism for non-standard use

The private message mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e. the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability;
- by vendors for research purposes, e.g. to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The private message mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.3.2 Elementary Procedure Definitions
RANAP-PDU-Descriptions {  
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)  
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-PDU-Descriptions (0)}

DEFINITIONS AUTOMATIC TAGS ::= 

BEGIN

-- IE parameter types from other modules.

IMPORTS
  Criticality,
  ProcedureCode
FROM RANAP-CommonDataTypes
  Iu-ReleaseCommand,
  Iu-ReleaseComplete,
  RelocationCommand,
  RelocationPreparationFailure,
  RelocationRequired,
  RelocationRequest,
  RelocationRequestAcknowledge,
  RelocationFailure,
  RelocationCancel,
  RelocationCancelAcknowledge,
  EnhancedRelocationCompleteRequest,
  EnhancedRelocationCompleteResponse,
  EnhancedRelocationCompleteFailure,
  EnhancedRelocationCompleteConfirm,
  SRNS-ContextRequest,
  SRNS-ContextResponse,
  SecurityModeCommand,
  SecurityModeComplete,
  SecurityModeReject,
  DataVolumeReportRequest,
  DataVolumeReport,
  Reset,
  ResetAcknowledge,
  RAB-ReleaseRequest,
  Iu-ReleaseRequest,
  RelocationDetect,
  RelocationComplete,
  Paging,
  CommonID,
  CN-InvokeTrace,
CN-DeactivateTrace,
LocationReportingControl,
LocationReport,
InitialUE-Message,
DirectTransfer,
Overload,
ErrorIndication,
SRNS-DataForwardCommand,
ForwardSRNS-Context,
RAB-AssignmentRequest,
RAB-AssignmentResponse,
RAB-ModifyRequest,
PrivateMessage,
ResetResource,
ResetResourceAcknowledge,
RANAP-RelocationInformation,
RANAP-EnhancedRelocationInformationRequest,
RANAP-EnhancedRelocationInformationResponse,
LocationRelatedDataRequest,
LocationRelatedDataResponse,
LocationRelatedDataFailure,
InformationTransferIndication,
InformationTransferConfirmation,
InformationTransferFailure,
UESpecificInformationIndication,
DirectInformationTransfer,
UplinkInformationExchangeRequest,
UplinkInformationExchangeResponse,
UplinkInformationExchangeFailure,
MBMSSessionStart,
MBMSSessionStartResponse,
MBMSSessionStartFailure,
MBMSSessionUpdate,
MBMSSessionUpdateResponse,
MBMSSessionUpdateFailure,
MBMSSessionStop,
MBMSSessionStopResponse,
MBMSUELinkingRequest,
MBMSUELinkingResponse,
MBMSRegistrationRequest,
MBMSRegistrationResponse,
MBMSRegistrationFailure,
MBMSCNDe-RegistrationRequest,
MBMSCNDe-RegistrationResponse,
MBMSRABEstablishmentIndication,
MBMSRABEstablishmentRequest,
MBMSRABRelease,
MBMSRABReleaseFailure,
SRVCC-CSKeysRequest,
SRVCC-CSKeysResponse
FROM RANAP-PDU-Contents

id-LocationRelatedData,
id-CN-DeactivateTrace,
id-CN-InvokeTrace,
id-CommonID,
id-DataVolumeReport,
id-DirectTransfer,
id-ErrorIndication,
id-ForwardSRNS-Context,
id-InformationTransfer,
id-InitialUE-Message,
id-Iu-Release,
id-Iu-ReleaseRequest,
id-LocationReport,
id-LocationReportingControl,
id-OverloadControl,
id-Paging,
id-privateMessage,
id-RAB-Assignment,
id-RAB-ReleaseRequest,
id-RAB-ModifyRequest,
id-RANAP-Relocation,
id-RANAPenhancedRelocation,
id-RelocationCancel,
id-RelocationComplete,
id-RelocationDetect,
id-RelocationPreparation,
id-RelocationResourceAllocation,
id-enhancedRelocationComplete,
id-enhancedRelocationCompleteConfirm,
id-Reset,
id-SRNS-ContextTransfer,
id-SRNS-DataForward,
id-SecurityModeControl,
id-ResetResource,
id-UESpecificInformation,
id-DirectInformationTransfer,
id-UplinkInformationExchange,
id-MBMSSessionStart,
id-MBMSSessionUpdate,
id-MBMSSessionStop,
id-MBMSUELLinking,
id-MBMSRegistration,
id-MBMSConDe-Registration-Procedure,
id-MBMSRAB EstablishmentIndication,
id-MBMSRABRelease,
id-SRVCCPreparation

FROM RANAP-Constants;

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

-- Interface Elementary Procedure Class

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

RANAP-ELEMENTARY-PROCEDURE ::= CLASS {

RANAP-PDU ::= CHOICE {
  initiatingMessage InitiatingMessage,
  successfulOutcome SuccessfulOutcome,
  unsuccessfulOutcome UnsuccessfulOutcome,
  outcome Outcome,
  ...
}

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

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

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

Outcome ::= SEQUENCE {
  procedureCode RANAP-ELEMENTARY-PROCEDURE.&procedureCode ({RANAP-ELEMENTARY-PROCEDURES}),
  criticality RANAP-ELEMENTARY-PROCEDURE.&criticality  ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode}),
  value RANAP-ELEMENTARY-PROCEDURE.&Outcome  ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode})
}
RANAP-ELEMENTARY-PROCEDURES RANAP-ELEMENTARY-PROCEDURE ::= {
  RANAP-ELEMENTARY-PROCEDURES-CLASS-1 |
  RANAP-ELEMENTARY-PROCEDURES-CLASS-2 |
  RANAP-ELEMENTARY-PROCEDURES-CLASS-3 |
...
}

RANAP-ELEMENTARY-PROCEDURES-CLASS-1 RANAP-ELEMENTARY-PROCEDURE ::= {
  iu-Release |
  relocationPreparation |
  relocationResourceAllocation |
  relocationCancel |
  sRNS-ContextTransfer |
  securityModeControl |
  dataVolumeReport |
  reset |
  resetResource |
  ...
  locationRelatedData |
  informationTransfer |
  uplinkInformationExchange |
  mBMSSessionStart |
  mBMSSessionUpdate |
  mBMSSessionStop |
  mBMSSubLinking |
  mBMSRegistration |
  mBMSContextTransfer |
  mBMSRABRelease |
  enhancedRelocationComplete |
  rANAP-enhancedRelocation |
  sRVCCPreparation |
}

RANAP-ELEMENTARY-PROCEDURES-CLASS-2 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-ReleaseRequest |
  iu-ReleaseRequest |
  relocationDetect |
  relocationComplete |
  paging |
  commonID |
  cN-InvokeTrace |
  cN-DeactivateTrace |
  locationReportingControl |
  locationReport |
  initialUE-Message |
  overloadControl |
  errorIndication |

---
iu-Release RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE Iu-ReleaseCommand
  SUCCESSFUL OUTCOME Iu-ReleaseComplete
  PROCEDURE CODE id-Iu-Release
  CRITICALITY reject
}

relocationPreparation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationRequired
  SUCCESSFUL OUTCOME RelocationCommand
  UNSUCCESSFUL OUTCOME RelocationPreparationFailure
  PROCEDURE CODE id-RelocationPreparation
  CRITICALITY reject
}

relocationResourceAllocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationRequest
  SUCCESSFUL OUTCOME RelocationRequestAcknowledge
  UNSUCCESSFUL OUTCOME RelocationFailure
  PROCEDURE CODE id-RelocationResourceAllocation
  CRITICALITY reject
}

relocationCancel RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationCancel
  SUCCESSFUL OUTCOME RelocationCancelAcknowledge
  PROCEDURE CODE id-RelocationCancel
  CRITICALITY reject
}

sRNS-ContextTransfer RANAP-ELEMENTARY-PROCEDURE ::= {

}
INITIATING MESSAGE SRNS-ContextRequest
SUCCESSFUL OUTCOME SRNS-ContextResponse
PROCEDURE CODE id-SRNS-ContextTransfer
CRITICALITY reject
}

securityModeControl RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE SecurityModeCommand
  SUCCESSFUL OUTCOME SecurityModeComplete
  UNSUCCESSFUL OUTCOME SecurityModeReject
  PROCEDURE CODE id-SecurityModeControl
  CRITICALITY reject
}

dataVolumeReport RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE DataVolumeReportRequest
  SUCCESSFUL OUTCOME DataVolumeReport
  PROCEDURE CODE id-DataVolumeReport
  CRITICALITY reject
}

reset RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE Reset
  SUCCESSFUL OUTCOME ResetAcknowledge
  PROCEDURE CODE id-Reset
  CRITICALITY reject
}

rAB-ReleaseRequest RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RAB-ReleaseRequest
  PROCEDURE CODE id-RAB-ReleaseRequest
  CRITICALITY ignore
}

iu-ReleaseRequest RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE Iu-ReleaseRequest
  PROCEDURE CODE id-Iu-ReleaseRequest
  CRITICALITY ignore
}

relocationDetect RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationDetect
  PROCEDURE CODE id-RelocationDetect
  CRITICALITY ignore
}

relocationComplete RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationComplete
  PROCEDURE CODE id-RelocationComplete
  CRITICALITY ignore
}

paging RANAP-ELEMENTARY-PROCEDURE ::= {
INITIATING MESSAGE Paging
PROCEDURE CODE id-Paging
CRITICALITY ignore
}

commonID RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE CommonID
  PROCEDURE CODE id-CommonID
  CRITICALITY ignore
}

cN-InvokeTrace RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE CN-InvokeTrace
  PROCEDURE CODE id-CN-InvokeTrace
  CRITICALITY ignore
}

cN-DeactivateTrace RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE CN-DeactivateTrace
  PROCEDURE CODE id-CN-DeactivateTrace
  CRITICALITY ignore
}

locationReportingControl RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE LocationReportingControl
  PROCEDURE CODE id-LocationReportingControl
  CRITICALITY ignore
}

locationReport RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE LocationReport
  PROCEDURE CODE id-LocationReport
  CRITICALITY ignore
}

initialUE-Message RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE InitialUE-Message
  PROCEDURE CODE id-InitialUE-Message
  CRITICALITY ignore
}

directTransfer RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE DirectTransfer
  PROCEDURE CODE id-DirectTransfer
  CRITICALITY ignore
}

overloadControl RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE Overload
  PROCEDURE CODE id-OverloadControl
  CRITICALITY ignore
}

errorIndication RANAP-ELEMENTARY-PROCEDURE ::= {

INITIATING MESSAGE  ErrorIndication
PROCEDURE CODE   id-ErrorIndication
CRITICALITY  ignore

sRNS-DataForward RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  SRNS-DataForwardCommand
  PROCEDURE CODE   id-SRNS-DataForward
  CRITICALITY  ignore
}

forwardSRNS-Context RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  ForwardSRNS-Context
  PROCEDURE CODE   id-ForwardSRNS-Context
  CRITICALITY  ignore
}

rAB-Assignment RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RAB-AssignmentRequest
  OUTCOME   RAB-AssignmentResponse
  PROCEDURE CODE   id-RAB-Assignment
  CRITICALITY  reject
}

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

resetResource RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  ResetResource
  SUCCESSFUL OUTCOME  ResetResourceAcknowledge
  PROCEDURE CODE   id-ResetResource
  CRITICALITY  reject
}

rANAP-Relocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RANAP-RelocationInformation
  PROCEDURE CODE   id-RANAP-Relocation
  CRITICALITY  ignore
}

rAB-ModifyRequest RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RAB-ModifyRequest
  PROCEDURE CODE   id-RAB-ModifyRequest
  CRITICALITY  ignore
}

locationRelatedData RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  LocationRelatedDataRequest
  SUCCESSFUL OUTCOME  LocationRelatedDataResponse
  UNSUCCESSFUL OUTCOME  LocationRelatedDataFailure
}
PROCEDURE CODE   id-LocationRelatedData
CRITICALITY reject

informationTransfer RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE InformationTransferIndication
  SUCCESSFUL OUTCOME InformationTransferConfirmation
  UNSUCCESSFUL OUTCOME InformationTransferFailure
  PROCEDURE CODE id-InformationTransfer
  CRITICALITY reject
}

uESpecificInformation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE UESpecificInformationIndication
  PROCEDURE CODE id-UESpecificInformation
  CRITICALITY ignore
}

directInformationTransfer RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE DirectInformationTransfer
  PROCEDURE CODE id-DirectInformationTransfer
  CRITICALITY ignore
}

uplinkInformationExchange RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE UplinkInformationExchangeRequest
  SUCCESSFUL OUTCOME UplinkInformationExchangeResponse
  UNSUCCESSFUL OUTCOME UplinkInformationExchangeFailure
  PROCEDURE CODE id-UplinkInformationExchange
  CRITICALITY reject
}

mBMSSessionStart RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSSessionStart
  SUCCESSFUL OUTCOME MBMSSessionStartResponse
  UNSUCCESSFUL OUTCOME MBMSSessionStartFailure
  PROCEDURE CODE id-MBMSSessionStart
  CRITICALITY reject
}

mBMSSessionUpdate RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSSessionUpdate
  SUCCESSFUL OUTCOME MBMSSessionUpdateResponse
  UNSUCCESSFUL OUTCOME MBMSSessionUpdateFailure
  PROCEDURE CODE id-MBMSSessionUpdate
  CRITICALITY reject
}

mBMSSessionStop RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSSessionStop
  SUCCESSFUL OUTCOME MBMSSessionStopResponse
  PROCEDURE CODE id-MBMSSessionStop
  CRITICALITY reject
}
mBMSUELinking RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSUELinkingRequest
  OUTCOME MBMSUELinkingResponse
  PROCEDURE CODE id-MBMSUELinking
  CRITICALITY reject
}

mBMSRegistration RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSRegistrationRequest
  SUCCESSFUL OUTCOME MBMSRegistrationResponse
  UNSUCCESSFUL OUTCOME MBMSRegistrationFailure
  PROCEDURE CODE id-MBMSRegistration
  CRITICALITY reject
}

mBMSCNDe-Registration RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSCNDe-RegistrationRequest
  SUCCESSFUL OUTCOME MBMSCNDe-RegistrationResponse
  PROCEDURE CODE id-MBMSCNDe-Registration-Procedure
  CRITICALITY reject
}

mBMSRAB EstablishmentIndication RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSRAB EstablishmentIndication
  PROCEDURE CODE id-MBMSRAB EstablishmentIndication
  CRITICALITY ignore
}

mBMSRABRelease RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE MBMSRAB ReleaseRequest
  SUCCESSFUL OUTCOME MBMSRAB Release
  UNSUCCESSFUL OUTCOME MBMSRAB Release Failure
  PROCEDURE CODE id-MBMSRAB Release
  CRITICALITY reject
}

enhancedRelocationComplete RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE EnhancedRelocationComplete Request
  SUCCESSFUL OUTCOME EnhancedRelocationComplete Response
  UNSUCCESSFUL OUTCOME EnhancedRelocationComplete Failure
  PROCEDURE CODE id-enhancedRelocationComplete
  CRITICALITY reject
}

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

rANAP-enhancedRelocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RANAP-EnhancedRelocation Information Request
  SUCCESSFUL OUTCOME RANAP-EnhancedRelocation Information Response
  PROCEDURE CODE id-RANAP-enhancedRelocation
}
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-RSC-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-PTF-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, CMC-ID, OldBSS-ToNewBSS-Information, PagingAreaID, PagingCause, PDP-TypeInformation, PDP-TypeInformation-extension, PermanentNAS-UE-ID, PLMNIdentity, PositionData, PositionDataSpecificToGERANIuMode, PositioningPriority, ProvidedData, RAB-ID, RAB-Parameters, RAC, RAListofIdleModeUEs, RAT-Type, RedirectAttemptFlag, RedirectionCompleted, RejectCauseValue, RelocationType, RequestedGANSSAssistanceData, RequestType, Requested-RAB-Parameter-Values, ResponseTime, RRC-Container, 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, 
Alt-RAB-Parameters, 
Ass-RAB-Parameters, 
PeriodicLocationInfo, 
SubscriberProfileIDforRFP, 
RNSAPRelocationParameters, 
RABParametersList, 
MDT-Configuration, 
Priority-Class-Indicator, 
Management-Based-MDT-Allowed, 
HigherBitratesThan16MbpsFlag, 
End-Of-CSFB

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, 
maxNrOfVo1, 
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-FrequencyLayerConvergenceFlag,
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-IuSigConId,
id-IuSigConIdCS,
id-IuSigConIdIDCS,
id-IuSigConIdIDPS,
id-IuSigConIdItem,
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-MBMSSynchronisationInformation,
id-MBMSServiceArea,
id-MBMSSessionDuration,
id-MBMSSessionIdentity,
id-MBMSSessionRepetitionNumber,
id-MSISDN,
id-NAS-FDU,
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-UB-ID,
id-PositionData,
id-PositionDataSpecificToGERANuMode,
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-FailedItemSRNS-CtxReq,
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-ReleaseFailedItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleasedList,
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-RedirectCompleted, 
id-RedirectIndication, 
id-RejectCauseValue, 
id-RelocationType, 
id-Relocation-SourceRNC-ID, 
id-Relocation-SourceExtendedRNC-ID, 
id-Relocation-TargetRNC-ID, 
id-Relocation-TargetExtendedRNC-ID, 
id-RequestedGANSSAssistanceData, 
id-RequestType, 
id-ResponseTime, 
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-UESSSI-Iu,
id-UL-GTP-EDU-SequenceNumber,
id-UnsuccessfulLinkingList,
id-VelocityEstimate,
id-VerticalAccuracyCode,
id-PeriodicLocationInfo,
id-BroadcastGNSSAssistanceDataDecipheringKeys,
id-SubscriberProfileIDforRFP,
id-B-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

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-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 },
  ...
}

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 } |
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-Cell-Access-Mode CRITICALITY reject EXTENSION Cell-Access-Mode PRESENCE optional },
...
}

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

RelocationCommandIEs RANAP-PROTOCOL-IES ::= {
  -- 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-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 } |
  { ID id-Source-ToTarget-TransparentContainer CRITICALITY reject TYPE Source-ToTarget-TransparentContainer PRESENCE conditional } |
  { ID id-OldBSS-ToNewBSS-Information CRITICALITY ignore TYPE OldBSS-ToNewBSS-Information PRESENCE optional },
...
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 },
  ... 
  ... 
}

RelocationPreparationFailure ::= SEQUENCE {
  ... 
  -- Relocation Preparation Failure 
  ... 
}

ETS
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
--- ************************************************************** --

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-UEBSI-Iu CRITICALITY ignore EXTENSION UEBSI-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},
...

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-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
--
-- **************************************************************
-- 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
-- **************************************************************
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 ::= {
  ...
}

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

-- **************************************************************
-- Relocation Cancel Complete
-- **************************************************************
RelocationCancelComplete ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {RelocationCancelCompleteIEs} },
  protocolExtensions ProtocolExtensionContainer { {RelocationCancelCompleteExtensions} } OPTIONAL,
  ...
}

RelocationCancelCompleteIEs RANAP-PROTOCOL-IES ::= {
  ...
}

RelocationCancelCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
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
    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 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 {
  ...
}
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
--- ************************************************************

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-PailedtoReportList  CRITICALITY ignore TYPE RAB-PailedtoReportList  PRESENCE optional } |
  { ID id-CriticalityDiagnostics  CRITICALITY ignore TYPE CriticalityDiagnostics  PRESENCE optional },
  ...
}

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

RAB-PailedtoReportList ::= RAB-IE-ContainerList { {RABs-failed-to-reportItemIEs} }
RABs-failed-to-reportItemIEs RANAP-PROTOCOL-IES ::= {
  ...
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 ::= 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 },
  ...
}
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

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 ::= {
  ...
}

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 ::= {
  ...
}
--- 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-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 ::= {
  ...
}

RelocationDetect ::= SEQUENCE {
  protocolIEs   ProtocolIE-Container   { {RelocationDetectIEs} },
  protocolExtensions  ProtocolExtensionContainer { {RelocationDetectExtensions} }    OPTIONAL,
  ...
}

RelocationDetectIEs RANAP-PROTOCOL-IES ::= {
  ...
}

RelocationDetectExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
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 },
  ...
}

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 },
    ...
}

-- ************************************************************
-- 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} }

ETS
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 ::= {
    -- Extension for Release 10 to enable Offload at Iu-ps for UTRAN --
    ID id-MSISDN CRITICALITY ignore  EXTENSION MSISDN PRESENCE optional}, ...
}

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}, ...
}

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

-- 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 --

  ...}
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```
{ 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 },
...

-- ************************************************************--
-- 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 } |
-- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
  { ID id-TriggerID    CRITICALITY ignore TYPE TriggerID      PRESENCE optional } |
-- This information is mandatory for UTRAN, optional for GERAN Iu mode --
  { ID id-UE-ID     CRITICALITY ignore TYPE UE-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-Addess CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},
...

-- **********************************************************************--
-- CN DEACTIVATE TRACE ELEMENTARY PROCEDURE
-- **********************************************************************--
```
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 ::= {
  ... 
}

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 } |
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-- 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 },
...

-- ************************************************************
-- INITIAL UE MESSAGE ELEMENTARY PROCEDURE
-- ************************************************************

ETSI
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 reject EXTENSION TransportLayerAddress     PRESENCE optional}|
  -- Extension for Release 9 to enable higher bitrates related to higher bitrates --
  { ID id-HigherBitratesThan16MbpsFlag    CRITICALITY ignore EXTENSION HigherBitratesThan16MbpsFlag     PRESENCE optional}|
  ...
}

-- ************************************************************** --
-- DIRECT TRANSFER ELEMENTARY PROCEDURE
-- ************************************************************** --
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}|
  ...}

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 reject EXTENSION TransportLayerAddress 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-UB-ID CRITICALITY ignore TYPE PermanentNAS-UB-ID 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
-- *************************************************************
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 --
  ...
}

-- *************************************************************
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 ::= {
...
}

-- ************************************************************
-- FORWARD SRNS CONTEXT ELEMENTARY PROCEDURE
-- **********************************************
-- -- Forward SRNS Context
-- -- ************************************************************

ForwardSRNS-Context ::= SEQUENCE {
  protocolIEs   ProtocolIE-Container   { {ForwardSRNS-ContextIEs} },
  protocolExtensions  ProtocolExtensionContainer { {ForwardSRNS-ContextExtensions} }   OPTIONAL,
...
}

ForwardSRNS-ContextIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ContextList   CRITICALITY ignore TYPE RAB-ContextList   PRESENCE mandatory },
...
}
ForwardSRNS-ContextExtensions 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 },
    ...
}

-- ************************************************************
-- RAB ASSIGNMENT ELEMENTARY PROCEDURE
-- ************************************************************
-- ************************************************************
-- RAB Assignment Request
-- ************************************************************

RAB-AssignmentRequest ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { {RAB-AssignmentRequestIEs} },
    protocolExtensions ProtocolExtensionContainer { {RAB-AssignmentRequestExtensions} } OPTIONAL,
    ...
}

RAB-AssignmentRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifyList CRITICALITY ignore TYPE RAB-SetupOrModifyList PRESENCE optional },
    { ID id-RAB-ReleaseList CRITICALITY ignore TYPE RAB-ReleaseList PRESENCE optional },
    ...
}

RAB-SetupOrModifyList ::= RAB-IE-ContainerPairList { {RAB-SetupOrModifyItem-IEs} }

RAB-SetupOrModifyItem-IEs RANAP-PROTOCOL-IES-PAIR ::= {
    { 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  
    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},

    ...

}  

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 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 {

    ...

-- RAB Assignment Response

-- ************************************************************
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-FailedList-RABAssgntResponse-ItemIEs} }

GERAN-Iumode-RAB-FailedList-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,
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 SourceRNCToTargetRNC-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 reject 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 { {TNLIInformationEnhRelInfoReq-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} |
    -- 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},
    ...
}

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

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 --
  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-BroadcastGANSSAssistanceDataDecipheringKeys 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 ::= {
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-- 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-IBS ::= {
    { 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-IBS ::= {
    { 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 },
...

ETSI
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-IES ::= {
    { ID id-UESBI-Iu CRITICALITY ignore TYPE UESBI-Iu PRESENCE optional },
    ...
}
UESpecificInformationIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ... 
}

-- ***************************************************************
-- DIRECT INFORMATION TRANSFER ELEMENTARY PROCEDURE
-- ***************************************************************

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

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 } |
  { ID id-InformationRequestType CRITICALITY reject TYPE InformationRequestType PRESENCE conditional } |
  { ID id-CN-DomainIndicator CRITICALITY reject TYPE CN-DomainIndicator PRESENCE mandatory } |
  { ID id-GlobalRNC-ID CRITICALITY reject TYPE GlobalRNC-ID PRESENCE mandatory } |
  -- This IE shall be present if the Information Exchange Type IE is set to "transfer" -- |
  } |

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} },
  ... |

-- ************************************************************
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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-RAlotofIdleModeUEs CRITICALITY ignore TYPE RAlotofIdleModeUEs PRESENCE optional } |
  { ID id-Globa1CN-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 Release 9 to enable a new value --
{ ID id-PDP-TypeInformation-extension CRITICALITY ignore EXTENSION PDP-TypeInformation-extension PRESENCE optional },

```
MBMSsynchronisationInformation ::= SEQUENCE {
  mbMSSHCIndicator MBMSHCIndicator,
  iPMulticastAddress IPMulticastAddress,
  gTPDLTEID GTP-TEID,
  iE-Extensions ProtocolExtensionContainer { {MBMSsynchronisationInformation-ExtIEs} } OPTIONAL,
  ...
}
```

```
-- ************************************************************
-- MBMS Session Start Response
-- ************************************************************
```
```
MBMSsynchronisationInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-IP-Source-Address CRITICALITY reject EXTENSION IPMulticastAddress PRESENCE optional },
  ...
}
```

```
-- ***************************************************************
-- MBMS Session Start Response
-- ***************************************************************
```
```
MBMSsynchronisationInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-IP-Source-Address CRITICALITY reject EXTENSION IPMulticastAddress PRESENCE optional },
  ...
}
```

```
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 ::= {
  ...
}
```

```
MBMSsessionStartFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
```

```
-- ***************************************************************
-- MBMS Session Start Failure
-- ***************************************************************
```
```
MBMSsessionStartFailure ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { { MBMSsessionStartFailureIEs} },
  protocolExtensions ProtocolExtensionContainer { { MBMSsessionStartFailureExtensions} } OPTIONAL,
  ...
}
```
```plaintext
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,
  ...
}

MBMSSessionUpdateIEs RANAP-PROTOCOL-IES ::= {
  { ID id-SessionUpdateID        CRITICALITY reject TYPE SessionUpdateID        PRESENCE mandatory } |
  { ID id-DeltaRAListofIdleModeUEs CRITICALITY reject TYPE DeltaRAListofIdleModeUEs PRESENCE mandatory },
  ...
}

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

-- ************************************************************************
-- MBMS Session Update Response
-- ************************************************************************

MBMSSessionUpdateResponse ::= SEQUENCE {
  protocolIEs    ProtocolIE-Container { { MBMSSessionUpdateResponseIEs} },
  protocolExtensions  ProtocolExtensionContainer { { MBMSSessionUpdateResponseExtensions} }  OPTIONAL,
  ...
}

MBMSSessionUpdateResponseIEs RANAP-PROTOCOL-IES ::= {
  { ID id-SessionUpdateID        CRITICALITY ignore TYPE SessionUpdateID        PRESENCE mandatory } |
  { ID id-TransportLayerInformation CRITICALITY ignore TYPE TransportLayerInformation PRESENCE optional } |
  ...
}
```

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

-- ******************************************************************************
-- MBMS Session Update Failure
-- ******************************************************************************

MBMSUpdateFailure ::= SEQUENCE {
  protocolIEs            ProtocolIE-Container { { MBMSUpdateFailureIEs} },
  protocolExtensions     ProtocolExtensionContainer { { MBMSUpdateFailureExtensions} } OPTIONAL,
...
}

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

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

-- ******************************************************************************
-- MBMS SESSION STOP PROCEDURE
-- ******************************************************************************

MBMSStop ::= SEQUENCE {
  protocolIEs            ProtocolIE-Container { { MBMSStopIEs} },
  protocolExtensions     ProtocolExtensionContainer { { MBMSStopExtensions} }   OPTIONAL,
...
}

MBMSStopIEs RANAP-PROTOCOL-IES ::= {
  { ID id-MBMSNDe-Registration CRITICALITY reject TYPE MBMSNDe-Registration PRESENCE mandatory } ,
...
}

-- ******************************************************************************
-- MBMS Session Stop
-- ******************************************************************************

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

-- ******************************************************************************
-- MBMS SESSION STOP PROCEDURE
-- ******************************************************************************

MBMSStop ::= SEQUENCE {
  protocolIEs            ProtocolIE-Container { { MBMSStopIEs} },
  protocolExtensions     ProtocolExtensionContainer { { MBMSStopExtensions} }   OPTIONAL,
...
}

MBMSStopIEs RANAP-PROTOCOL-IES ::= {
  { ID id-MBMSNDe-Registration CRITICALITY reject TYPE MBMSNDe-Registration PRESENCE mandatory } ,
...
}

-- ******************************************************************************
--
MBMSExtension RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- ************************************************************
-- MBMS Session Stop Response
-- ************************************************************

MBMSExtension ::= SEQUENCE {
  protocolIEs    ProtocolIE-Container  { { MBMSExtensionIEs} },
  protocolExtensions  ProtocolExtensionContainer { { MBMSExtensionExtensions} }  OPTIONAL,
  ...
}

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

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

-- **************************************************************
-- MBMS UE LINKING PROCEDURE
-- **************************************************************

-- **************************************************************
-- MBMS UE Linking Request
-- **************************************************************

MBMSUELinkingRequest ::= SEQUENCE {
  protocolIEs    ProtocolIE-Container  { { MBMSUELinkingRequestIEs} },
  protocolExtensions  ProtocolExtensionContainer { { MBMSUELinkingRequestExtensions} }   OPTIONAL,
  ...
}

MBMSUELinkingRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-JoinedMBMSBearerServicesList CRITICALITY reject TYPE JoinedMBMSBearerService-IEs  PRESENCE optional } |
  { ID id-LeftMBMSBearerServicesList    CRITICALITY reject TYPE LeftMBMSBearerService-IEs     PRESENCE optional },
  ...
}

LeftMBMSBearerService-IEs ::= SEQUENCE (SIZE (1.. maxnoofMulticastServicesPerUE)) OF
  SEQUENCE {
    tMGI    TMGI,
  }
LeftMBMSBearerService-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

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

-- *******************************************************
-- MBMS UE Linking Response
-- *******************************************************

MBMSUELinkingResponse ::= SEQUENCE {
  protocolIEs    ProtocolIE-Container { { MBMSUELinkingResponseIEs} },
  protocolExtensions  ProtocolExtensionContainer { { MBMSUELinkingResponseExtensions} }  OPTIONAL,
  ...
}

MBMSUELinkingResponseIEs RANAP-PROTOCOL-IES ::= {  { ID id-UnsuccessfulLinkingList   CRITICALITY ignore TYPE UnsuccessfulLinking-IEs  PRESENCE optional } |
  { ID id-CriticalityDiagnostics   CRITICALITY ignore TYPE CriticalityDiagnostics   PRESENCE optional } ,
  ...
}

UnsuccessfulLinking-IEs ::= SEQUENCE {SIZE (1.. maxnoofMulticastServicesPerUE)) OF
  SEQUENCE {
    tMGI    TMGI,
    cause    Cause,
    iE-Extensions  ProtocolExtensionContainer { {UnsuccessfulLinking-ExtIEs} } OPTIONAL,
    ...
  }

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

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

-- *******************************************************
-- MBMS REGISTRATION PROCEDURE
-- *******************************************************

--
-- MBMS Registration Request
-- ************************************************************

MBMSRegistrationRequest ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container { { MBMSRegistrationRequestIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSRegistrationRequestExtensions} }   OPTIONAL,
    ... }

MBMSRegistrationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-MBMSRegistrationRequestType     CRITICALITY reject TYPE MBMSRegistrationRequestType  PRESENCE mandatory } |
    { ID id-TMGI    CRITICALITY reject TYPE TMGI    PRESENCE mandatory } |
    { ID id-IPMulticastAddress  CRITICALITY reject TYPE IPMulticastAddress  PRESENCE conditional
        -- This IE shall be present if the MBMS Registration Request Type IE is set to "register" --
    } |
    { ID id-APN     CRITICALITY reject TYPE APN     PRESENCE conditional
        -- This IE shall be present if the MBMS Registration Request Type IE is set to "register" --
    } |
    { ID id-GlobalRNC-ID    CRITICALITY reject TYPE GlobalRNC-ID    PRESENCE optional },
    ... }

MBMSRegistrationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    -- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID    CRITICALITY reject EXTENSION ExtendedRNC-ID    PRESENCE optional },
    ... }

-- ************************************************************
-- MBMS Registration Response
-- ************************************************************

MBMSRegistrationResponse ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container { { MBMSRegistrationResponseIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSRegistrationResponseExtensions} }  OPTIONAL,
    ... }

MBMSRegistrationResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TMGI       CRITICALITY ignore TYPE TMGI  PRESENCE optional } |
    { ID id-GlobalCN-ID      CRITICALITY ignore TYPE GlobalCN-ID     PRESENCE optional } |
    { ID id-CriticalityDiagnostics   CRITICALITY ignore TYPE CriticalityDiagnostics   PRESENCE optional } |
    ... }

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

-- ************************************************************
-- MBMS Registration Failure
-- --
MBMSRegistrationFailure ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { MBMSRegistrationFailureIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSRegistrationFailureExtensions} } OPTIONAL,
    ...
}

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

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

-- ************************************************************
-- -- MBMS CN DE-REGISTRATION PROCEDURE
-- -- ************************************************************

-- ************************************************************
-- -- MBMS CN De-Registration Request
-- -- ************************************************************

MBMSCNDe-RegistrationRequest ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { MBMSCNDe-RegistrationRequestIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSCNDe-RegistrationRequestExtensions} } OPTIONAL,
    ...
}

MBMSCNDe-RegistrationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TMGI      CRITICALITY reject TYPE TMGI         PRESENCE mandatory },
    { ID id-GlobalCN-ID     CRITICALITY reject TYPE GlobalCN-ID       PRESENCE optional },
    ...
}

MBMSCNDe-RegistrationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- ************************************************************
-- -- MBMS CN De-Registration Response
-- -- ************************************************************

...
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MBMSCNDe-RegistrationResponse ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { MBMSCNDe-RegistrationResponseIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSCNDe-RegistrationResponseExtensions} } OPTIONAL,
    ...
}

MBMSCNDe-RegistrationResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TMGI         CRITICALITY ignore TYPE TMGI         PRESENCE mandatory },
    { ID id-GlobalRNC-ID CRITICALITY ignore TYPE GlobalRNC-ID PRESENCE mandatory },
    { ID id-Cause        CRITICALITY ignore TYPE Cause        PRESENCE optional   },
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

MBMSCNDe-RegistrationResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    -- Extension for Release 7 to indicate extended RNC-ID --
    { ID id-ExtendedRNC-ID CRITICALITY reject EXTENSION ExtendedRNC-ID PRESENCE optional },
    ...
}

-- **************************************************************
-- MBMS RAB ESTABLISHMENT INDICATION PROCEDURE
-- **************************************************************

-- ***************************
-- MBMS RAB Establishment Indication
-- ***************************

MBMSRABEstablishmentIndication ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { MBMSRABEstablishmentIndicationIEs} },
    protocolExtensions ProtocolExtensionContainer { { MBMSRABEstablishmentIndicationExtensions} } OPTIONAL,
    ...
}

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

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

-- **************************************************************
-- MBMS RAB RELEASE PROCEDURE
-- **************************************************************

-- ***************************
-- MBMS RAB Release Procedure
-- ***************************

-- **************************************************************
MBMSRABReleaseRequest ::= SEQUENCE {
    protocolIEs  ProtocolIE-Container  { {MBMSRABReleaseRequestIEs} },
    protocolExtensions  ProtocolExtensionContainer { {MBMSRABReleaseRequestExtensions} }   OPTIONAL,
    ...
}

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

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

MBMSRABRelease ::= SEQUENCE {
    protocolIEs  ProtocolIE-Container  { {MBMSRABReleaseIEs} },
    protocolExtensions  ProtocolExtensionContainer { {MBMSRABReleaseExtensions} }   OPTIONAL,
    ...
}

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

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

MBMSRABReleaseFailure ::= SEQUENCE {
    protocolIEs  ProtocolIE-Container  { {MBMSRABReleaseFailureIEs} },
    protocolExtensions  ProtocolExtensionContainer { {MBMSRABReleaseFailureExtensions} }   OPTIONAL,
    ...
}

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

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

-- **************************************************************
-- -- SRVCC PREPARATION ELEMENTARY PROCEDURE
-- -- **************************************************************

-- -- SRVCC CS Keys Request
-- -- **************************************************************

SRVCC-CSKeysRequest ::= SEQUENCE {
  protocolIEs   ProtocolIE-Container   { {SRVCC-CSKeysRequestIEs} },
  protocolExtensions  ProtocolExtensionContainer { {SRVCC-CSKeysRequestExtensions} }    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 ::= {

}

SRVCC-CSKeysResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {

}
9.3.4 Information Element Definitions

-- ***********************************************************************
-- -- Information Element Definitions
-- -- ***********************************************************************

RANAP-IEs { itut (0) identified-organization (4) etsi (0) mobileDomain (0) umts-Access (20) modules (3) ranap (0) version1 (1) ranap-IEs (2) }
DEFINITIONS AUTOMATIC TAGS ::= 
BEGIN 
IMPORTS 
 maxNrOfCSGs, 
 maxNrOfErrors, 
 maxNrOfPDPDirections, 
 maxNrOfPoints, 
 maxNrOfRABs, 
 maxNrOfSRBs, 
 maxNrOfSeparateTrafficDirections, 
 maxRAB-Subflows, 
 maxRAB-SubflowCombination, 
 maxRAB-Levels, 
 maxRAB-AltValues, 
 maxSNAs, 
 maxFLAs, 
 maxPLMNasSN, 
 maxSet, 
 maxHSDSCHMACdFlows-1, 
 maxUEsToBeTraced, 
 maxInterfaces, 
 maxnoofMulticastServicesPerRNC, 
 MAXMBMSSA, 
 MAXMBMSRA, 
 maxnoofMulticastServicesPerUE, 
 maxRAB-EDCHMACdFlows-1, 
 maxGANSSSet, 
 maxRAB-EUTRAFREQs, 
 maxRAB-CellIds,
maxNrOfRAIs,
maxNrOfLAIs,
maxNrOfVVol,

FROM RANAP-Constants

Criticality,
ProcedureCode,
ProtocolIE-ID,
TriggeringMessage
FROM RANAP-CommonDataTypes

ProtocolExtensionContainer{},
RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;

-- A

AccuracyFulfilmentIndicator ::= ENUMERATED{
  requested-Accuracy-Fulfilled,
  requested-Accuracy-Not-Fulfilled,
  ...
}

AllocationOrRetentionPriority ::= SEQUENCE {
  priorityLevel   PriorityLevel,
  pre-emptionCapability  Pre-emptionCapability,
  pre-emptionVulnerability Pre-emptionVulnerability,
  queuingAllowed QueueingAllowed,
  iE-Extensions ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
  ...
}

AllocationOrRetentionPriority-ExtIEs 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 ::= {
  ...
}

Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf ::= SEQUENCE {
  altExtendedGuaranteedBitrateType   Alt-RAB-Parameter-GuaranteedBitrateType,
  altExtendedGuaranteedBitrates Alt-RAB-Parameter-ExtendedGuaranteedBitrates  OPTIONAL}
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-SupportedGuaranteedBitrateInf ::= SEQUENCE {
  altSupportedGuaranteedBitrateType   Alt-RAB-Parameter-SupportedGuaranteedBitrateType,
  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" --,
    ...
}

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
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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-SupportedMaxBitrateInf ::= SEQUENCE {
  altSupportedMaxBitrateType   Alt-RAB-Parameter-MaxBitrateType,
  altSupportedMaxBitrates    Alt-RAB-Parameter-SupportedMaxBitrates   OPTIONAL
  -- This IE shall be present if the Type of Supported Alternative Maximum 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,
  ...

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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 ignored EXTENSION SupportedRAB-ParameterBitrateList PRESENCE optional }|
  -- Extension for Release 8 to indicate an supported assigned Guaranteed Bitrate --
  { ID id-Ass-RAB-Parameter-SupportedGuaranteedBitrateList  CRITICALITY ignored 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 PLMNIdentity

AuthorisedSNAs ::= SEQUENCE {SIZE (1..maxNrOfSNAs)} OF SNAC

-- BindingID ::= OCTET STRING (SIZE (4))

BroadcastAssistanceDataDecipheringKeys ::= SEQUENCE {
  ...}

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

BroadcastAssistanceDataDecipheringKeys-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...}
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),
  tqueing-expiry (5),
  relocation-triggered (6),
  treloccalloc-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-PURSINE-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-NSSP (61),
mBMS-UE-linking-already-done (62),
mBMS-UE-de-linking-failure-no-existing-UE-linking (63),
tMGI-unknown (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 ::= INTGRER (0..268435455)

Cell-Capacity-Class-Value ::= INTGRER (1..100,...)

CellLoadInformation ::= SEQUENCE {
  cell-Capacity-Class-Value Cell-Capacity-Class-Value,
  loadValue LoadValue,  OPTIOINAL,
  rTLoadValue RTLoadValue,  OPTIOINAL,
  nRTLoadInformationValue NRTLoadInformationValue  OPTIOINAL,
  iE-Extensions ProtocolExtensionContainer { { CellLoadInformation-ExtIEs } }  OPTIOINAL,
...}

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,
  ...
}

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 {
  ...

ETSI
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 OPTIONAL,
  rALlistwithNoIdleModeUEsAnyMore 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-newRAListofIdleModeUEs 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-NPDU-SequenceNumber ::= INTEGER (0..65535)
D-RNTI ::= INTEGER (0..1048575)
DRX-CycleLengthCoefficient ::= INTEGER (6..9)
DSCH-ID ::= INTEGER (0..255)

-- E
R-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 (160000001..256000000)  
-- Unit is bits per sec

ExtendedMaxBitrate ::= INTEGER (160000001..256000000)  
-- Unit is bits per sec

ExtendedRNC-ID ::= INTEGER (4096..65535)  
-- F

FrameSequenceNumber ::= INTEGER(0..15)
FrequenceLayerConvergenceFlag ::= 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-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
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

HigherBitratesThan16MbpsFlag ::= ENUMERATED{
  allowed,
  not-allowed,
  ...
}

HS-DSCH-MAC-d-Flow-ID ::= INTEGER (0..maxNrOfHSDSCHMACdFlows-1)

IMEI ::= OCTET STRING (SIZE (8))
-- Reference: 23.003

IMEIGroup ::= SEQUENCE {
  iIMEI   IMEI,
  iIMEIMask 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 {
  iIMEISV IMEISV,
  iIMEISVMask 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
  ...
}
IMSI ::= TBCD-STRING (SIZE (3..8))

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 {
  ...
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 {
  pLMMIdentity PLMIdentity,
  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 ::= {
  ...
}

ListOfSNAs ::= 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 GANS" or
  ...
}

LocationRelatedDataRequestTypeSpecificToGERANIuMode ::= ENUMERATED {
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 {
  ...}
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,
  ...
}

MBMHCIIndicator ::= 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
MBMSDuration ::= OCTET STRING {SIZE (3)}

MBMSIdentity ::= OCTET STRING {SIZE (1)}
MBMSRepetitionNumber ::= 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 ::= {
  ...
}

MDTMode ::= CHOICE {
  immediateMDT ImmediateMDT, loggedMDT LoggedMDT, ...
}

MDT-Report-Parameters ::= SEQUENCE {
  reportInterval ReportInterval, reportAmount ReportAmount,
  ...
}

MeasurementQuantity ::= ENUMERATED {
cpichEcNo, cpichRSCP, pathloss, ...
}
MeasurementsToActivate ::= BIT STRING {size (8)}
MSISDN ::= OCTET STRING {size (1..9)}

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
}

NRTLoadInformationValue ::= INTEGER {0..3}
NumberOfIuInstances ::= INTEGER {1..2}
NumberOfSteps ::= INTEGER {1..16}

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]
    -- P
PagingAreaID ::= CHOICE {

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 ::= {
  ...
}

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 \},
  ...
}

PositionDataSpecificToGERAN\{NuMode ::= 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,
  ...}

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 Guaranteed Bitrate --
  { ID id-RAB-Parameter-SupportedGuaranteedBitrateList CRITICALITY reject EXTENSION SupportedRAB-ParameterGuaranteedBitrateList PRESENCE optional }|
  -- Extension for Release 8 to indicate an Supported Maximum Bitrate --
  { ID id-RAB-Parameter-SupportedMaxBitrateList CRITICALITY reject EXTENSION SupportedRAB-ParameterMaxBitrateList PRESENCE optional },
  ...
}

RABParametersList ::= SEQUENCE (SIZE (1.. maxNrOfRABs)) OF SEQUENCE {
  rab-Id   RAB-ID,
  cn-domain   CN-DomainIndicator,
  rabDataVolumeReport   RABDataVolumeReport OPTIONAL,
  upInformation   URPIInformation 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 {
  rAoofIdleModeUEs RAoofIdleModeUEs,
  iE-Extensions ProtocolExtensionContainer { {NotEmptyRAListofIdleModeUEs-ExtIEs} } OPTIONAL
}

RAoofIdleModeUEs ::= SEQUENCE (SIZE (1..maxMBMSRA)) OF RAC

NotEmptyRAListofIdleModeUEs-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-LAoofIdleModeUEs CRITICALITY reject EXTENSION LAListofIdleModeUEs PRESENCE conditional },
  -- This IE shall be present if the RA of Idle Mode UE 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,
  ...
}

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,
  ms5000,
  ms12000,
  ms16000,
  ms20000,
  ms24000,
  ms32000,
  ms64000,
  ...
}

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 {
  iMGI    TMGI,
  iPMulticastAddress  IPMulticastAddress,
  aPN      APN,
  iE-Extensions   ProtocolExtensionContainer { {MBMSIPMulticastAddressandAPNlist-ExtIEs} } OPTIONAL,
  ...
}

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

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-ParameterMaxBitrateList PRESENCE optional }|
  -- Extension for Release 8 to request an Supported Guaranteed Bitrate --
  { ID id-Requested-RAB-Parameter-SupportedGuaranteedBitrateList CRITICALITY reject EXTENSION SupportedRAB-ParameterGuaranteedBitrateList 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..9), 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)

RNCTraceInformation ::= SEQUENCE {
  traceReference TraceReference,
  traceActivationIndicator ENUMERATED {activated, deactivated},
  equipmentsToBeTraced EquipmentstoBeTraced OPTIONAL,
  iE-Extensions     ProtocolExtensionContainer { { RNCTraceInformation-ExtIEs} } OPTIONAL
}

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

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

RTLoadValue ::= INTEGER (0..100)

-- S

SAC ::= OCTET STRING

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,
  ... 
}

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 ::= {
  ...
}

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]
SourceNodeB-ToTargetNodeB-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},
...}

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 ::= {
    ...}

IRATmeasurementParameters::= SEQUENCE {
    measurementDuration  INTEGER (1..100),
    eUTRANFrequencies    EUTRANFrequencies (SIZE (1..maxNrOfEUTRAFreqs)) OF SEQUENCE {
        earfcn     INTEGER (0..65535),
        measBand   MeasBand OPTIONAL,
        iE-Extensions ProtocolExtensionContainer { {EUTRANFrequencies-ExtIEs} } OPTIONAL}
    iE-Extensions    ProtocolExtensionContainer { {IRATmeasurementParameters-ExtIEs} } OPTIONAL}

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

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 ::= {
    ...}
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      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]

TargetNodeB-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,
  ...
}
TargetRNB-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)

TimeToMBMSDataTransfer ::= 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))

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))

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

UB-ID ::= CHOICE {
  imsi   IMSI,
  imei   IMEI,
  ..., 
  imeisv IMEISV
}

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 ::= {
  ...
}

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    HorizontalWithVerticalVelocityWithUncertainty,  
horizontalWithVerticalVelocityWithUncertainty    HorizontalWithVerticalVelocityWithUncertainty,  
    ...
}

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)

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-RANAP-Relocation INTEGER ::= 27
id-RAB-ModifyRequest INTEGER ::= 29
id-LocationRelatedData INTEGER ::= 30
id-InformationTransfer INTEGER ::= 31
id-UESpecificInformation INTEGER ::= 32
id-DirectInformationExchange INTEGER ::= 33
id-MBMSSessionStart INTEGER ::= 35
id-MBMSSessionUpdate INTEGER ::= 36
id-MBMSessionStop INTEGER ::= 37
id-MBMSUELinking INTEGER ::= 38
id-MBMSRegistration INTEGER ::= 39
id-MBMS CNBCe-Registration-Procedure INTEGER ::= 40
id-MBMS RAB Establishment Indication INTEGER ::= 41
id-MBMS RAB Release INTEGER ::= 42
id-enhancedRelocationComplete INTEGER ::= 43
id-enhancedRelocationCompleteConfirm INTEGER ::= 44
id-RANAP enhanced Relocation INTEGER ::= 45
id-SRVCC Preparation INTEGER ::= 46

-- ****************************************************************************************************************************
-- Extension constants
-- ****************************************************************************************************************************
maxPrivateIEs INTEGER ::= 65535
maxProtocolExtensions INTEGER ::= 65535
maxProtocolIEs INTEGER ::= 65535

-- ****************************************************************************************************************************
-- Lists
-- ****************************************************************************************************************************
maxNrOfDTs INTEGER ::= 15
maxNrOfErrors INTEGER ::= 256
maxNrOfTuwSigConIds INTEGER ::= 250
maxNrOfPDPPDIcons INTEGER ::= 2
maxNrOfPoints INTEGER ::= 15
maxNrOfRABs INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfSRBs INTEGER ::= 8
maxNrOfVo1 INTEGER ::= 2
maxNrOfLevels INTEGER ::= 256
maxNrOfAltValues INTEGER ::= 16
maxNrOfPIANsNSN 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 INTEGER ::= 7
maxnoofMulticastServicesPerUE INTEGER ::= 128
maxnoofMulticastServicesPerRNC INTEGER ::= 512
maxMBMSSA INTEGER ::= 256
maxMBMSRA INTEGER ::= 65536
maxNrOfEDCHMACdFlows INTEGER ::= 7
maxGANSSSet INTEGER ::= 9
maxNrOfCSSs INTEGER ::= 256
maxNrOfEUTRAFreqs INTEGER ::= 8
maxNrOfCellIds INTEGER ::= 32
maxNrOfRAIs INTEGER ::= 8
maxNrOfLAIas INTEGER ::= 8

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

id-AreaIdentity INTEGER ::= 0
id-CN-DomainIndicator INTEGER ::= 3
id-Cause INTEGER ::= 4
id-ChosenEncryptionAlgorithm INTEGER ::= 5
id-ChosenIntegrity ProtectionAlgorithm 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-JtTransportAssociation 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-ReleaseList-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-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-DCP-context-info INTEGER ::= 103
id-InformationTransferID INTEGER ::= 104
id-SMA-Access-Information INTEGER ::= 105
id-ProvidedData INTEGER ::= 106
id-GERAN-BSC-Container INTEGER ::= 107
id-GERAN-Classmark INTEGER ::= 108
id-GERAN-Tmode-RAB-Failed-RABAssgntResponse-Item INTEGER ::= 109
id-GERAN-Tmode-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
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<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>id-RedirectIndication</td>
<td>INTEGER ::= 129</td>
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<tr>
<td>id-NAS-SequenceNumber</td>
<td>INTEGER ::= 130</td>
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<tr>
<td>id-RejectCauseValue</td>
<td>INTEGER ::= 131</td>
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<td>id-APN</td>
<td>INTEGER ::= 132</td>
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<td>id-CNMBMSLinkingInformation</td>
<td>INTEGER ::= 133</td>
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<tr>
<td>id-DeltaRAListofIdleModeUEs</td>
<td>INTEGER ::= 134</td>
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</tr>
<tr>
<td>id-FrequencyLayerConvergenceFlag</td>
<td>INTEGER ::= 135</td>
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<tr>
<td>id-InformationExchangeID</td>
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<td>id-InformationExchangeType</td>
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<td>id-IPMulticastAddress</td>
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<td>id-MBMSConvergence</td>
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<td>id-MBMSServiceArea</td>
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<td>id-MBMSRegistrationRequestType</td>
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<td></td>
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<td>id-SessionUpdateID</td>
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<tr>
<td>id-TMGI</td>
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<td>id-TransportLayerInformation</td>
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<td>id-UnsuccessfulLinkingList</td>
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<td>id-MBMSLinkingInformation</td>
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<tr>
<td>id-MBMSRegistrationRequestType</td>
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<td></td>
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<td>id-SessionUpdateID</td>
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<td>id-IncludeVelocity</td>
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<tr>
<td>id-RedirectAttemptFlag</td>
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<tr>
<td>id-RAT-Type</td>
<td>INTEGER ::= 161</td>
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<td>id-PeriodicLocationInfo</td>
<td>INTEGER ::= 162</td>
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<tr>
<td>id-MBMSCountingInformation</td>
<td>INTEGER ::= 163</td>
<td></td>
</tr>
<tr>
<td>id-170-not-to-be-used-for-IE-ids</td>
<td>INTEGER ::= 164</td>
<td></td>
</tr>
<tr>
<td>id-ExtendedRNC-ID</td>
<td>INTEGER ::= 165</td>
<td></td>
</tr>
<tr>
<td>id-Alt-RAB-Parameter-ExtendedGuaranteedBitrateInf</td>
<td>INTEGER ::= 166</td>
<td></td>
</tr>
<tr>
<td>id-Alt-RAB-Parameter-ExtendedMaxBitrateInf</td>
<td>INTEGER ::= 167</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 168</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 169</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateInf</td>
<td>INTEGER ::= 170</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateInf</td>
<td>INTEGER ::= 171</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 172</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 173</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateInf</td>
<td>INTEGER ::= 174</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 175</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 176</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 177</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 178</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 179</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 180</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedMaxBitrateList</td>
<td>INTEGER ::= 181</td>
<td></td>
</tr>
<tr>
<td>id-Ass-RAB-Parameter-ExtendedGuaranteedBitrateList</td>
<td>INTEGER ::= 182</td>
<td></td>
</tr>
</tbody>
</table>
id-183-not-to-be-used-for-IE-ids  INTEGER ::= 183
id-GNSS-PositioningDataSet  INTEGER ::= 184
id-RequestedGNSSAssistanceData  INTEGER ::= 185
id-BroadcastGNSSAssistanceDataDecipheringKeys  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-MBMSsynchronisationinformation  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-Rejection-SourceRNC-ID  INTEGER ::= 222
id-Rejection-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 ::= 232
id-CSG-Membership-Status  INTEGER ::= 233
id-Cell-Access-Mode  INTEGER ::= 234
id-IP-Source-Address  INTEGER ::= 235
id-CSFB-Information  INTEGER ::= 236
9.3.7 Container Definitions

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

IMPORTS
  Criticality,
  Presence,
  PrivateIE-ID,
  ProtocolExtensionID,
  ProtocolIE-ID
FROM RANAP-CommonDataTypes

  maxPrivateIEs,
  maxProtocolExtensions,
  maxProtocolIEs
FROM RANAP-Constants;
RANAP-PROTOCOL-IES ::= CLASS {
    &id    ProtocolIE-ID      UNIQUE,
    &criticality   Criticality,
    &Value,
    &presence   Presence
}
WITH SYNTAX {
    ID    &id
    CRITICALITY   &criticality
    TYPE    &Value
    PRESENCE   &presence
}

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
}

RANAP-PROTOCOL-EXTENSION ::= CLASS {
    &id    ProtocolExtensionID     UNIQUE,
    &criticality   Criticality,  &Extension,
    &presence  Presence
}
WITH SYNTAX {
    ID    &id
    CRITICALITY   &criticality
    TYPE    &Extension
    PRESENCE   &presence
}
RANAP-PRIVATE-IES ::= CLASS {
  &id    PrivateIE-ID,
  &criticality   Criticality,
  &Value,
  &presence  Presence
} WITH SYNTAX {
  ID    &id
  CRITICALITY   &criticality
  TYPE   &Value
  PRESENCE  &presence
}

RANAP-PRIVATE-IES-PAIR ::= CLASS {
  &id    PrivateIE-ID,
  &firstCriticality  Criticality,
  &Value,
  &firstPresence  Presence
} WITH SYNTAX {
  ID    &id
  CRITICALITY   &criticality
  TYPE   &Value
  PRESENCE  &presence
}
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}}

  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 ref. 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.

$T_{\text{RELOComcomplete}}$
- Specifies the maximum time for waiting the relocation completion in the CN.

$T_{\text{RABAssgt}}$
- Specifies the maximum time in the CN for the whole RAB Assignment procedure.

$T_{\text{QUEUING}}$
- Specifies the maximum time in the RNC for queuing of the request of RAB establishment or modification.

$T_{\text{DATAfwd}}$
- Specifies the maximum time for GTP-PDU forwarding at the source RNC during relocation of SRNS.

$T_{\text{igOC}}$
- While this timer is running, all OVERLOAD messages or signalling point congested information received at the CN are ignored.

$T_{\text{igOR}}$
- While this timer is running, all OVERLOAD messages or signalling point congested information received at the RNC are ignored.

$T_{\text{inTC}}$
- While this timer is running, the CN is not allowed to increase traffic.

$T_{\text{inTR}}$
- While this timer is running, the RNC is not allowed to increase traffic.

$T_{\text{RefC}}$
- Specifies the maximum time for Reset procedure in the RNC.

$T_{\text{RefC}}$
- Specifies a guard period in the RNC before sending a RESET ACKNOWLEDGE message.

$T_{\text{RefR}}$
- Specifies the maximum time for Reset procedure in the CN.

$T_{\text{RefR}}$


- Specifies a guard period in the CN before sending a RESET ACKNOWLEDGE message.

\( T_{\text{NNSF}} \)

- Specifies the maximum time the RNC may store Permanent NAS UE Identity IE (and the related Global CN-ID IE) when NNSF is active.

## 10 Handling of Unknown, Unforeseen and Erroneous Protocol Data

### 10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error.
- Abstract Syntax Error.
- Logical Error.

Protocol errors can occur in the following functions within a receiving node:

![Figure 10.1: Protocol Errors in RANAP.](image)

The information stated in subclauses 10.2, 10.3 and 10.4, to be included in the message used when reporting an error, is what at minimum shall be included. Other optional information elements within the message may also be included, if available. This is also valid for the case when the reporting is done with a response message. The latter is an exception to what is stated in subclause 4.1.

### 10.2 Transfer Syntax Error

A Transfer Syntax Error occurs when the receiver is not able to decode the received physical message. Transfer syntax errors are always detected in the process of ASN.1 decoding. If a Transfer Syntax Error occurs, the receiver should initiate Error Indication procedure with appropriate cause value for the Transfer Syntax protocol error.

Examples for Transfer Syntax Errors are:

- Violation of value ranges in ASN.1 definition of messages. e.g.: If an IE has a defined value range of 0 to 10 (ASN.1: INTEGER (0..10)), and 12 will be received, then this will be treated as a transfer syntax error.

- Violation in list element constraints. e.g.: If a list is defined as containing 1 to 10 elements, and 12 elements will be received, than this case will be handled as a transfer syntax error.

- Missing mandatory elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

- Wrong order of elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).
10.3 Abstract Syntax Error

10.3.1 General

An Abstract Syntax Error occurs when the receiving functional RANAP entity:

1. receives IEs or IE groups that cannot be understood (unknown IE ID);

2. receives IEs for which the logical range is violated (e.g.: ASN.1 definition: 0 to 15, the logical range is 0 to 10 (values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message);

3. does not receive IEs or IE groups but according to the specified presence of the concerning object, the IEs or IE groups should have been present in the received message.

4. receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;

5. receives IEs or IE groups but according to the conditional presence of the concerning object and the specified condition, the IEs or IE groups should not have been present in the received message.

Cases 1 and 2 (not comprehended IE/IE group) are handled based on received Criticality information. Case 3 (missing IE/IE group) is handled based on Criticality information and Presence information for the missing IE/IE group specified in the version of the specification used by the receiver. Case 4 (IEs or IE groups in wrong order or with too many occurrences) and Case 5 (erroneously present conditional IEs or IE groups) result in rejecting the procedure.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error that belong to cases 1-3 act according to the Criticality Information and Presence Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclauses 10.3.4 and 10.3.5. The handling of cases 4 and 5 is specified in subclause 10.3.6.

10.3.2 Criticality Information

In the RANAP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended, i.e. the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.4.

In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.
- Ignore IE and Notify Sender.
- Ignore IE.

The following rules restrict when a receiving entity may consider an IE, an IE group, or an EP not comprehended (not implemented), and when action based on criticality information is applicable:

1. IE or IE group: When one new or modified IE or IE group is implemented for one EP from a standard version, then other new or modified IEs or IE groups specified for that EP in that standard version shall be considered comprehended by a receiving entity (some may still remain unsupported).

2. EP: The comprehension of different EPs within a standard version or between different standard versions is not mandated. Any EP that is not supported may be considered not comprehended, even if another EP from that standard version is comprehended, and action based on criticality shall be applied.
10.3.3 Presence Information

For many IEs/IE groups which are optional according to the ASN.1 transfer syntax, RANAP specifies separately if the presence of these IEs/IE groups is optional or mandatory with respect to RNS application by means of the presence field of the concerning object of class RANAP-PROTOCOL-IES, RANAP-PROTOCOL-IES-PAIR, RANAP-PROTOCOL-EXTENSION or RANAP-PRIVATE-IES.

The presence field of the indicated classes supports three values:

1. Optional;
2. Conditional;
3. Mandatory.

If an IE/IE group is not included in a received message and the presence of the IE/IE group is mandatory or the presence is conditional and the condition is true according to the version of the specification used by the receiver, an abstract syntax error occurs due to a missing IE/IE group.

If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

10.3.4 Not comprehended IE/IE group

10.3.4.1 Procedure Code

The receiving node shall treat the different types of received criticality information of the Procedure Code IE according to the following:

Reject IE:
- If a message is received with a Procedure Code IE marked with "Reject IE" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

Ignore IE and Notify Sender:
- If a message is received with a Procedure Code IE marked with "Ignore IE and Notify Sender" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

Ignore IE:
- If a message is received with a Procedure Code IE marked with "Ignore IE" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the Procedure Code IE, the Triggering Message IE, and the Procedure Criticality IE in the Criticality Diagnostics IE.

10.3.4.1A Type of Message

When the receiving node cannot decode the Type of Message IE, the Error Indication procedure shall be initiated with an appropriate cause value.

10.3.4.2 IEs other than the Procedure Code and Type of Message

The receiving node shall treat the different types of received criticality information of an IE/IE group other than the Procedure Code IE and Type of Message IE according to the following:

Reject IE:
- If a message initiating a procedure is received containing one or more IEs/IE group marked with "Reject IE" which the receiving node does not comprehend; none of the functional requests of the message shall be executed.
The receiving node shall reject the procedure and report the rejection of one or more IEs/IE group using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message initiating a procedure that does not have a message to report unsuccessful outcome is received containing one or more IEs/IE groups marked with "Reject IE" which the receiving node does not comprehend, the receiving node shall terminate the procedure and initiate the Error Indication procedure.

- If a response message is received containing one or more IEs marked with "Reject IE", that the receiving node does not comprehend, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

**Ignore IE and Notify Sender:**

- If a message initiating a procedure is received containing one or more IEs/IE groups marked with "Ignore IE and Notify Sender" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups, and report in the response message of the procedure that one or more IEs/IE groups have been ignored. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a response message is received containing one or more IEs/IE groups marked with "Ignore IE and Notify Sender", that the receiving node does not comprehend, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

**Ignore IE:**

- If a message initiating a procedure is received containing one or more IEs/IE groups marked with "Ignore IE" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using the understood IEs/IE groups.

- If a response message is received containing one or more IEs/IE groups marked with "Ignore IE" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using the understood IEs/IE groups.

When reporting not comprehended IEs/IE groups marked with "Reject IE" or "Ignore IE and Notify Sender" using a response message defined for the procedure, the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group. In the Information Element Criticality Diagnostics IE the Repetition Number IE shall be included and in addition, if the not comprehended IE/IE group is not at message hierarchy level 1 (top level; see annex A2) also the Message Structure IE shall be included.

When reporting not comprehended IEs/IE groups marked with "Reject IE" or "Ignore IE and Notify Sender" using the Error Indication procedure, the Procedure Code IE, the Triggering Message IE, Procedure Criticality IE, and the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group. In the Information Element Criticality Diagnostics IE the Repetition Number IE shall be included and in addition, if the not comprehended IE/IE group is not at message hierarchy level 1 (top level; see annex A2) also the Message Structure IE shall be included.
10.3.5 Missing IE or IE group

The receiving node shall treat the missing IE/IE group according to the criticality information for the missing IE/IE group in the received message specified in the version of this specification used by the receiver:

Reject IE:

- if a received message initiating a procedure is missing one or more IEs/IE groups with specified criticality "Reject IE"; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the missing IEs/IE groups using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- if a received message initiating a procedure that does not have a message to report unsuccessful outcome is missing one or more IEs/IE groups with specified criticality "Reject IE", the receiving node shall terminate the procedure and initiate the Error Indication procedure.

- if a received response message is missing one or more IEs/IE groups with specified criticality "Reject IE", the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

Ignore IE and Notify Sender:

- if a received message initiating a procedure is missing one or more IEs/IE groups with specified criticality "Ignore IE and Notify Sender", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and report in the response message of the procedure that one or more IEs/IE groups were missing. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- if a received message initiating a procedure that does not have a message to report the outcome of the procedure is missing one or more IEs/IE groups with specified criticality "Ignore IE and Notify Sender", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.

- if a received response message is missing one or more IEs/IE groups with specified criticality "Ignore IE and Notify Sender", the receiving node shall ignore that those IEs/IE groups are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.

Ignore IE:

- if a received message initiating a procedure is missing one or more IEs/IE groups with specified criticality "Ignore IE", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message.

- if a received response message is missing one or more IEs/IE groups with specified criticality "Ignore IE", the receiving node shall ignore that those IEs/IE groups are missing and continue with the procedure based on the other IEs/IE groups present in the message.

When reporting missing IEs/IE groups with specified criticality "Reject IE" or "Ignore IE and Notify Sender" using a response message defined for the procedure, the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group. In the Information Element Criticality Diagnostics IE the Repetition Number IE shall be included and in addition, if the missing IE/IE group is not at message hierarchy level 1 (top level; see annex A2) also the Message Structure IE shall be included.

When reporting missing IEs/IE groups with specified criticality "Reject IE" or "Ignore IE and Notify Sender" using the Error Indication procedure, the Procedure Code IE, the Triggering Message IE, Procedure Criticality IE, and the Information Element Criticality Diagnostics IE shall be included in the Criticality Diagnostics IE for each reported IE/IE group. In the Information Element Criticality Diagnostics IE the Repetition Number IE shall be included and in addition, if the missing IE/IE group is not at message hierarchy level 1 (top level; see annex A2) also the Message Structure IE shall be included.
10.3.6 IEs or IE groups received in wrong order or with too many occurrences or erroneously present

If a message with IEs or IE groups in wrong order or with too many occurrences is received or if IEs or IE groups with a conditional presence are present when the condition is not met (i.e. erroneously present), the receiving node shall behave according to the following:

- If a message *initiating* a procedure is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the cause value "Abstract Syntax Error (Falsely Constructed Message)" using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall terminate the procedure and initiate the Error Indication procedure, and use cause value "Abstract Syntax Error (Falsely Constructed Message)".

- If a *response* message is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

When determining the correct order only the IEs specified in the specification version used by the receiver shall be considered.

10.4 Logical Error

Logical error situations occur when a message is comprehended correctly, but the information contained within the message is not valid (i.e. semantic error), or describes a procedure which is not compatible with the state of the receiver. In these conditions, the following behaviour shall be performed (unless otherwise specified) as defined by the class of the elementary procedure, irrespective of the criticality information of the IEs/IE groups containing the erroneous values.

**Class 1:**

Where the logical error occurs in a request message of a class 1 procedure, and the procedure has a message to report this unsuccessful outcome, this message shall be sent with an appropriate cause value. Typical cause values are:

- Semantic Error.
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 1 procedure, and the procedure does not have a message to report this unsuccessful outcome, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

Where the logical error exists in a response message of a class 1 procedure, the procedure shall be considered as unsuccessfully terminated and local error handling shall be initiated.

**Class 2:**

Where the logical error occurs in a message of a class 2 procedure, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

**Class 3:**

Where the logical error occurs in a request message of a class 3 procedure, and the procedure has a message to report this unsuccessful outcome, this message shall be sent with an appropriate cause value. Typical cause values are:
- Semantic Error.
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 3 procedure, and the procedure does not have a message to report this unsuccessful outcome, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The Procedure Code IE and the Triggering Message IE within the Criticality Diagnostics IE shall then be included in order to identify the message containing the logical error.

Where the logical error exists in a response message of a class 3 procedure, the procedure shall be considered as unsuccessfully terminated and local error handling shall be initiated.

10.5 Exceptions

The error handling for all the cases described hereafter shall take precedence over any other error handling described in the other subclauses of clause 10.

- If any type of error (Transfer Syntax Error, Abstract Syntax Error or Logical Error) is detected in the ERROR INDICATION message, it shall not trigger the Error Indication procedure in the receiving Node but local error handling.

- In case a response message or Error Indication message needs to be returned, but the information necessary to determine the receiver of that message is missing, the procedure shall be considered as unsuccessfully terminated and local error handling shall be initiated.

- If an error that terminates a procedure occurs, the returned cause value shall reflect the error that caused the termination of the procedure even if one or more abstract syntax errors with criticality "ignore and notify" have earlier occurred within the same procedure.

11 Special Procedures for RNC to RNC Communication

11.1 General

This subclause specifies special procedures that are used for RNC to RNC communication, and that use other transport means than the RANAP procedures specified in clause 8.

11.2 RANAP Relocation Information

11.2.1 General

The purpose of the RANAP Relocation Information procedure is to handle the RANAP-related information that is carried transparently during relocation from a source RNC to a target RNC by RNSAP via the Iur Interface.

11.2.2 Operation

When during relocation it becomes necessary in the source RNC to generate RANAP information for transfer to the relocation target, the RNC shall form a RANAP RELOCATION INFORMATION message. The message shall be encoded according to the encoding rules specified for RANAP in the similar manner as for the normal RANAP messages. The outcome of the encoding will be an octet string, which shall not be sent to the CN via the Iu Interface, but shall be given to the appropriate local process for transparent transfer to the target RNC.

When the RANAP process in the target RNC receives an octet string containing a RANAP RELOCATION INFORMATION message that had been transparently transferred from the source RNC, it shall decode it according to the encoding rules specified for RANAP. This process is similar to receiving any normal RANAP message. The decoded information shall be passed to the appropriate processes in the RNC.
The RANAP RELOCATION INFORMATION message may contain the Direct Transfer Information List IE, the RAB Contexts List IE and the Source RNC PDCP context info IE. If present, the Direct Transfer Information List IE shall contain the NAS-PDU IE, the SAPI IE and the CN Domain Indicator IE. If present, the RAB Contexts List IE shall contain for each addressed RAB:

- the RAB ID IE;
- if available, the DL GTP-PDU Sequence Number IE;
- if available, the UL GTP-PDU Sequence Number IE;
- if available, the DL N-PDU Sequence Number IE;
- if available, the UL N-PDU Sequence Number IE.

Handling in case of RNSAP Relocation:

In case of RNSAP Relocation for each CS RAB operated in support mode (see TS 25.415 [6] for the definition of 'support mode') the source RNC shall include within the RANAP RELOCATION INFORMATION message the RNSAP Relocation Parameters IE containing the RAB Parameters List IE which shall include the UP Information IE. For each CS RAB operated in support mode for which the user data frame numbering is based on time the source RNC shall include the Timing Difference UL-DL IE within the UP Information IE.

In case of RNSAP Relocation for each PS RAB for which data volume reporting was configured, the source RNC shall include the RAB Data Volume Reports IE within the RAB Parameters List IE included in the RANAP RELOCATION INFORMATION message.

In case Location Reporting was configure at the source RNC for periodic reporting and/or report upon change of Service area and/or direct reporting, the source RNC shall include the Location Reporting Transfer Information IE within the RANAP RELOCATION INFORMATION message.

The Periodic Reporting Indicator IE within the Location Reporting Transfer Information IE shall be set to 'periodic SAI' if periodic reporting is requested and the location information is requested to be a Service Area Identifier, to 'periodic Geo' if periodic reporting is requested and the location information is requested to be a geographical area.

The Direct Reporting Indicator IE within the Location Reporting Transfer Information IE shall be set to 'direct SAI' if periodic reporting is requested and the location information is requested to be a Service Area Identifier, to 'direct Geo' if periodic reporting is requested and the location information is requested to be a geographical area.

The conditions for the presence of further IEs within the Location Reporting Transfer Information are specified in subclause 8.19.2.

If signalling based trace activation was triggered at the source RNC, the RANAP RELOCATION INFORMATION shall contain the UE Trace Identity IE and the Trace Propagation Parameters IE in order to continue tracing at the target RNC accordingly.

### 11.3 RANAP Enhanced Relocation Information

#### 11.3.1 General

The purpose of the RANAP Enhanced Relocation Information procedure is to handle the RANAP-related information that is carried transparently during enhanced relocation from a source RNC to a target RNC by RNSAP via the Iur Interface.

#### 11.3.2 Operation

When during enhanced relocation it becomes necessary in the source RNC to generate RANAP information for transfer to the relocation target, the source RNC shall form a RANAP ENHANCED RELOCATION INFORMATION REQUEST message. The message shall be encoded according to the encoding rules specified for RANAP in the similar manner as for the normal RANAP messages. The outcome of the encoding will be an octet string, which shall be given to the appropriate local process for transparent transfer to the target RNC.
When the RANAP process in the target RNC receives an octet string containing a RANAP ENHANCED RELOCATION INFORMATION REQUEST message that had been transparently transferred from the source RNC, it shall decode it according to the encoding rules specified for RANAP. This process is similar to receiving any normal RANAP message. The decoded information shall be passed to the appropriate processes in the RNC.

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

The RANAP ENHANCED RELOCATION INFORMATION REQUEST message shall contain the following IE:

- Source RNC To Target RNC Transparent Container IE;

The RANAP ENHANCED RELOCATION INFORMATION REQUEST message may contain the following IEs:

- Old Iu Signalling Connection Identifier CS domain IE; if a connection to the CS domain exist;
- Old Iu Signalling Connection Identifier PS domain IE; if a connection to the PS domain exist;
- Global CN-ID for CS, if a connection to the CS domain exist;
- Global CN-ID for PS, if a connection to the PS domain exist;
- RABs to be Setup List;
- 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.

For each RAB requested to relocate in the RABs to be Setup List, the RANAP ENHANCED RELOCATION INFORMATION REQUEST message shall contain the following IEs in the RABs To Be Setup List IE:

- RAB ID IE;
- CN domain indicator IE;
- RAB parameters IE;
- User Plane Information IE;
- Source Side Iu UL TNL Information IE;
- Data Volume Reporting Indication IE (only for PS);
- PDP Type Information IE (only for PS).

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

- Data Forwarding TNL Information IE;
- Service Handover IE;
- Alternative RAB Parameter Values IE;
- E-UTRAN Service Handover IE;
- PDP Type Information extension IE (may be included if PDP Type Information IE is included).

If the Data Forwarding TNL Information IE is included in the RANAP ENHANCED RELOCATION INFORMATION REQUEST message, it indicates Iur UP resources, made available by the source RNC for forwarding of UL user data.
Note: The Source Side Iu UL TNL Information IE (in contrary to the Data Forwarding TNL Information IE) contains information to enable the target RNC to start transmission of user data towards the CN once the relocations has been successfully executed.

If the UE Aggregate Maximum Bit Rate IE is included in the RANAP ENHANCED RELOCATION INFORMATION REQUEST message, the target side 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 RANAP ENHANCED RELOCATION INFORMATION REQUEST message shall contain the information (if any) required by the target RNC to build at least the same set of RABs as existing for the UE before the relocation and therefore the RANAP ENHANCED RELOCATION INFORMATION REQUEST may contain the RABs to be SETUP List IE.

The resource allocation actions executed by the target RNC are:

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

- The target RNC should not accept a requested RAB if the RAB 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 RANAP ENHANCED RELOCATION INFORMATION RESPONSE 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 RANAP ENHANCED RELOCATION INFORMATION RESPONSE message sent to the source RNC;
- If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the RANAP ENHANCED RELOCATION INFORMATION RESPONSE message within the Assigned RAB Parameter Values IE;
- If d-RNTI for No IuCS UP IE is contained in the RANAP ENHANCED RELOCATION INFORMATION 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;
- Usage of alternative RAB parameter values is not applicable for any relocation of type "UE not involved in relocation of SRNS".

If the UE History Information IE is included in the RANAP ENHANCED RELOCATION INFORMATION REQUEST message and the target RNC is configured to collect the information, the target RNC shall collect the same type of information as that included in the UE History Information IE.

The Global CN ID IE and Old Iu Signalling Identifier IE (for PS and/or for CS) are used by the target RNC to establish new Iu Signalling connection(s) between the target RNC towards the CS and/or PS domain.

The RANAP ENHANCED RELOCATION INFORMATION 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 RANAP ENHANCED RELOCATION INFORMATION REQUEST message, the target RNC is allowed to use the alternative configuration.
The RNC shall, if supported, use the UESBI-Iu IE when included in the RANAP ENHANCED RELOCATION INFORMATION REQUEST message.

If the CN MBMS Linking Information IE is included in the RANAP ENHANCED RELOCATION INFORMATION 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].

If the SNA Access Information IE is included in the RANAP ENHANCED RELOCATION INFORMATION 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 SNAIEs.

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

If the 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.

After all necessary resources for accepted RABs including the initialised Iu user plane, are successfully allocated, the target RNC shall send a RANAP ENHANCED RELOCATION INFORMATION RESPONSE message to the source RNC.

For each RAB successfully setup the RNC shall include the following IEs in the RABs Setup List IE:

- RAB ID.

For each RAB the target RNC has admitted to execute data forwarding, the target RNC shall include the Data Forwarding Information IE in the RANAP ENHANCED RELOCATION INFORMATION RESPONSE message. If no ALCAP is used, the RNC shall include the DL Forwarding Transport Layer Address IE and the DL Forwarding Transport Association IE within the Data Forwarding Information IE in the RANAP ENHANCED RELOCATION INFORMATION RESPONSE message.

If applicable, the target RNC shall have executed the initialisation of the user plane mode between the source and the target RNC as requested by the source RNC in the User Plane Mode IE. If the target 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 target RNC may either decide to not relocate the respective RAB or to omit data forwarding for that RAB.

For each RAB the RNC is not able to setup during the Enhanced Relocation Information procedure, the RNC shall include the CN Domain Indicator IE 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 source RNC 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 RANAP ENHANCED RELOCATION INFORMATION RESPONSE message sent to the source RNC shall, if applicable, include the Target RNC To Source RNC Transparent Container IE.

Handling in case of RNSAP Relocation:

In case of RNSAP Relocation for each CS RAB operated in support mode (see TS 25.415 [6] for the definition of 'support mode') the source RNC shall include within the RANAP ENHANCED RELOCATION INFORMATION REQUEST message the RAB Parameters List IE which shall include the UP Information IE. For each CS RAB operated in support mode for which the user data frame numbering is based on time the source RNC shall include the Timing Difference UL-DL IE within the UP Information IE.

The source RNC shall also include within the RANAP ENHANCED RELOCATION INFORMATION REQUEST message

- the CSG ID IE (if available)
- the CSG Membership Status IE (if available).
Annex A (informative):
RANAP guidelines

A.1 Rules for building RANAP messages

A.1.1 Rules for RANAP messages that shall contain the CN Domain Indicator IE

Based on the principles described in TS 25.401 [3], the following rules can be deduced:

1) The following RANAP messages initiating a connection oriented signalling connection shall contain the CN Domain Indicator IE: INITIAL UE MESSAGE message and RELOCATION REQUEST message.

2) Any RANAP message belonging to class 1 procedures and which uses connectionless signalling shall contain the CN Domain Indicator IE.

3) The following RANAP messages belonging to class 2 procedures and using connectionless signalling shall contain the CN Domain Indicator IE: PAGING message and ERROR INDICATION message, the OVERLOAD message in DL direction (see chapter 8.25.3.1) may contain the CN Domain Indicator IE.

A.2 Guidelines for Usage of the Criticality Diagnostics IE

A.2.1 EXAMPLE MESSAGE Layout

Assume the following message format:

<table>
<thead>
<tr>
<th>IE/Group Name</th>
<th>Presence</th>
<th>Range</th>
<th>IE type and reference</th>
<th>Semantics description</th>
<th>Criticality</th>
<th>Assigned Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Type</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>A</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>B</td>
<td>M</td>
<td>YES</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;E</td>
<td>M</td>
<td>1..&lt;maxE&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;F</td>
<td>M</td>
<td>1..&lt;maxF&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;G</td>
<td>M</td>
<td>0..3, …</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;H</td>
<td>M</td>
<td>1..&lt;maxH&gt;</td>
<td>EACH</td>
<td>ignore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;G</td>
<td>M</td>
<td>0..3, …</td>
<td>EACH</td>
<td>ignore and notify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;G</td>
<td>M</td>
<td>1..&lt;maxJ&gt;</td>
<td>EACH</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;J</td>
<td>M</td>
<td>0..3, …</td>
<td>EACH</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
</tr>
<tr>
<td>&gt;K</td>
<td>M</td>
<td>1..&lt;maxK&gt;</td>
<td>EACH</td>
<td>ignore and notify</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;L</td>
<td>M</td>
<td>1..&lt;maxL&gt;</td>
<td>EACH</td>
<td>reject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;&gt;&gt;M</td>
<td>M</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>M</td>
<td></td>
<td></td>
<td>YES</td>
<td>reject</td>
<td></td>
</tr>
</tbody>
</table>

NOTE 1: The IEs F, J, and L do not have assigned criticality. The IEs F, J, and L are consequently realised as the ASN.1 type SEQUENCE OF of "ordinary" ASN.1 type, e.g. INTEGER. On the other hand, the repeatable IEs with assigned criticality are realised as the ASN.1 type SEQUENCE OF of an IE object, e.g. ProtocolIE-Container.

For the corresponding ASN.1 layout, see subclause A.2.4.
A.2.2 Example on a Received EXAMPLE MESSAGE

Assume further more that a received message based on the above tabular format is according to the figure below.

Figure A.1: Example of content of a received RANAP message based on the EXAMPLE MESSAGE
A.2.3 Content of Criticality Diagnostics

A.2.3.1 Example 1

Figure A.2: Example of a received RANAP message containing a not comprehended IE

If there is an error within the instance marked as grey in the IE G in the IE J shown in the figure A.2 above, this will be reported within the Information Element Criticality Diagnostics IE within the Criticality Diagnostics IE as follows:

<table>
<thead>
<tr>
<th>IE name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Criticality</td>
<td>reject</td>
<td>Criticality for IE on the reported level, i.e. level 4.</td>
</tr>
<tr>
<td>IE ID id-G</td>
<td></td>
<td>IE ID from the reported level, i.e. level 4.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>11</td>
<td>Repetition number on the reported level, i.e. level 4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Since the IE E (level 2) is the lowest level included in the Message Structure IE this is the eleventh occurrence of IE G within the IE E (level 2).)</td>
</tr>
<tr>
<td>Type of Error</td>
<td>not understood</td>
<td></td>
</tr>
</tbody>
</table>

NOTE 2: The IE J on level 3 cannot be included in the Message Structure IE since they have no criticality of their own.

NOTE 3: The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).
### A.2.3.2 Example 2

**Figure A.3: Example of a received RANAP message containing a not comprehended IE**

If there is an error within the second instance (marked as grey) in the sequence (IE L in the tabular format) on level 3 below IE K in the structure shown in the figure A.3 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

<table>
<thead>
<tr>
<th>IE name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Criticality</td>
<td>ignore and notify</td>
<td>Criticality for IE on the reported level, i.e. level 2.</td>
</tr>
<tr>
<td>IE ID</td>
<td>id-K</td>
<td>IE ID from the reported level, i.e. level 2.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>3</td>
<td>Repetition number on the reported level, i.e. level 2.</td>
</tr>
<tr>
<td>Type of Error</td>
<td>not understood</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Message Structure, first repetition</th>
<th>IE ID</th>
<th>IE ID from the lowest level above the reported level, i.e. level 1.</th>
</tr>
</thead>
</table>

**NOTE 4:** The IE L on level 3 cannot be reported individually included in the *Message Structure* IE since it has no criticality of its own.
A.2.3.3 Example 3

If there is an error within the instance marked as grey in the IE G in the IE H shown in the figure A.4 above, this will be reported within the Information Element Criticality Diagnostics IE within the Criticality Diagnostics IE as follows:

<table>
<thead>
<tr>
<th>IE name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Criticality</td>
<td>ignore and notify</td>
<td>Criticality for IE on the reported level, i.e. level 4.</td>
</tr>
<tr>
<td>IE ID</td>
<td>id-G</td>
<td>IE ID from the reported level, i.e. level 4.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>2</td>
<td>Repetition number on the reported level, i.e. level 4.</td>
</tr>
<tr>
<td>Type of Error</td>
<td>not understood</td>
<td></td>
</tr>
<tr>
<td>Message Structure, first repetition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;IE ID</td>
<td>id-B</td>
<td>IE ID from level 1.</td>
</tr>
<tr>
<td>Message Structure, second repetition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;IE ID</td>
<td>id-E</td>
<td>IE ID from level 2.</td>
</tr>
<tr>
<td>&gt;Repetition Number</td>
<td>3</td>
<td>Repetition number from level 2.</td>
</tr>
<tr>
<td>Message Structure, third repetition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;IE ID</td>
<td>id-H</td>
<td>IE ID from the lowest level above the reported level, i.e. level 3.</td>
</tr>
<tr>
<td>&gt;Repetition Number</td>
<td>1</td>
<td>Repetition number from the lowest level above the reported level, i.e. level 3.</td>
</tr>
</tbody>
</table>

NOTE 5: The repetition number of level 4 indicates the number of repetitions of IE G received up to the detected erroneous repetition, counted below the same instance of the previous level with assigned criticality (instance 1 of IE H on level 3).
A.2.3.4 Example 4

If there is an error within the instance marked as grey in the IE G in the IE E shown in the figure A.5 above, this will be reported within the Information Element Criticality Diagnostics IE within the Criticality Diagnostics IE as follows:

<table>
<thead>
<tr>
<th>IE name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Criticality</td>
<td>reject</td>
<td>Criticality for IE on the reported level, i.e. level 3.</td>
</tr>
<tr>
<td>IE ID</td>
<td>id-G</td>
<td>IE ID from the reported level, i.e. level 3.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>5</td>
<td>Repetition number on the reported level, i.e. level 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Since the IE E (level 2) is the lowest level included in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the Message Structure IE this is the fifth occurrence of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IE G within the IE E (level 2).</td>
</tr>
<tr>
<td>Type of Error</td>
<td>not understood</td>
<td></td>
</tr>
<tr>
<td>Message Structure</td>
<td>first repetition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>id-B</td>
<td>IE ID from level 1.</td>
</tr>
<tr>
<td></td>
<td>id-E</td>
<td>IE ID from the lowest level above the reported level, i.e.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>level 2.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Repetition number from the lowest level above the reported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>level, i.e. level 2.</td>
</tr>
</tbody>
</table>

NOTE 6: The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).
A.2.3.5 Example 5

If the instance marked as grey in the IE G in the IE E shown in the figure A.6 above, is missing this will be reported within the Information Element Criticality Diagnostics IE as follows:

<table>
<thead>
<tr>
<th>IE name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Criticality</td>
<td>reject</td>
<td>Criticality for IE on the reported level, i.e. level 3.</td>
</tr>
<tr>
<td>IE ID</td>
<td>id-G</td>
<td>IE ID from the reported level, i.e. level 3.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>4</td>
<td>Repetition number up to the missing IE on the reported level, i.e. level 3. (Since the IE E (level 2) is the lowest level included in the Message Structure IE there have been four occurrences of IE G within the IE E (level 2) up to the missing occurrence.)</td>
</tr>
<tr>
<td>Type of Error</td>
<td>missing</td>
<td></td>
</tr>
<tr>
<td>Message Structure, first repetition</td>
<td>id-B</td>
<td>IE ID from level 1.</td>
</tr>
<tr>
<td>Message Structure, second repetition</td>
<td>id-E</td>
<td>IE ID from the lowest level above the reported level, i.e. level 2.</td>
</tr>
<tr>
<td>Repetition Number</td>
<td>3</td>
<td>Repetition number from the lowest level above the reported level, i.e. level 2.</td>
</tr>
</tbody>
</table>

NOTE 7: The repetition number of the reported IE indicates the number of repetitions of IE G received up to but not including the missing occurrence, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).
A.2.4  ASN.1 of EXAMPLE MESSAGE

ExampleMessage ::= SEQUENCE {
    ProtocolIEs  ProtocolIE-Container   {{ExampleMessage-IEs}},
    ProtocolExtensions  ProtocolExtensionContainer  {{ExampleMessage-Extensions}} OPTIONAL,
    ...
}

ExampleMessage-IEs  RANAP-PROTOCOL-IES ::= {
  { ID id-A   CRITICALITY reject TYPE A PRESENCE mandatory } |
  { ID id-B   CRITICALITY reject TYPE B PRESENCE mandatory } |
  { ID id-C   CRITICALITY reject TYPE C PRESENCE mandatory } |
  { ID id-D   CRITICALITY reject TYPE D PRESENCE mandatory },
  ...
}

B ::= SEQUENCE {
  e        E-List,
  iE-Extensions ProtocolExtensionContainer  {{B-ExtIEs}} OPTIONAL,
  ...
}

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

E-List ::= SEQUENCE (SIZE (1..maxE)) OF ProtocolIE-Container  {{E-IEs}}

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

E ::= SEQUENCE {
  f        F-List,
  h        H-List,
  g        G-List1,
  j        J-List,
  iE-Extensions ProtocolExtensionContainer  {{E-ExtIEs}} OPTIONAL,
  ...
}

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

F-List ::= SEQUENCE (SIZE (1..maxF)) OF F

F ::= SEQUENCE {
  g        G-List2 OPTIONAL,
  iE-Extensions ProtocolExtensionContainer  {{F-ExtIEs}} OPTIONAL,
  ...
}

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

G-List2 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container  {{G2-IEs}}

G2-IEs  RANAP-PROTOCOL-IES ::= {
  { ID id-G   CRITICALITY ignore TYPE G PRESENCE mandatory },
  ...
}

H-List ::= SEQUENCE (SIZE (1..maxH)) OF ProtocolIE-Container  {{H-IEs}}

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

H ::= SEQUENCE {
  g        G-List3 OPTIONAL,
  iE-Extensions ProtocolExtensionContainer  {{H-ExtIEs}} OPTIONAL,
  ...
}
H-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...  
}
G-List3 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G3-IEs} }
G3-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-G CRITICALITY notify TYPE G PRESENCE mandatory },
  ...  
}
G-List1 ::= ProtocolIE-Container { {G1-IEs} }
G1-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-G CRITICALITY reject TYPE G PRESENCE mandatory },
  ...  
}
J-List ::= SEQUENCE (SIZE (1..maxJ)) OF J
J ::= SEQUENCE {
  g G-List4 OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {J-ExtIEs} } OPTIONAL,
  ...  
}
J-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...  
}
G-List4 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G4-IEs} }
G4-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-G CRITICALITY reject TYPE G PRESENCE mandatory },
  ...  
}
C ::= SEQUENCE {
  k K-List,
  iE-Extensions ProtocolExtensionContainer { {C-ExtIEs} } OPTIONAL,
  ...  
}
C-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...  
}
K-List ::= SEQUENCE (SIZE (1..maxK)) OF ProtocolIE-Container { {K-IEs} }
K-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-K CRITICALITY notify TYPE K PRESENCE mandatory },
  ...  
}
K ::= SEQUENCE {
  l L-List,
  iE-Extensions ProtocolExtensionContainer { {K-ExtIEs} } OPTIONAL,
  ...  
}
K-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...  
}
L-List ::= SEQUENCE (SIZE (1..maxL)) OF L
L ::= SEQUENCE {
  m M OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {L-ExtIEs} } OPTIONAL,
  ...  
}
L-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...  
}
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 adopt 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>
<thead>
<tr>
<th>Scenario</th>
<th>Source to Target Transparent Container IE in RANAP: RELOCATION REQUIRED message</th>
<th>Target to Source Transparent Container IE in RANAP: RELOCATION COMMAND message</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario</strong></td>
<td><strong>Name of the IE</strong></td>
<td><strong>Definition in specification</strong></td>
</tr>
<tr>
<td>Intra UTRAN relocation</td>
<td>Source RNC to Target RNC Transparent Container</td>
<td>25.413</td>
</tr>
<tr>
<td>Inter-system handover to E-UTRAN</td>
<td>Source eNB to Target eNB Transparent Container</td>
<td>36.413</td>
</tr>
</tbody>
</table>

Table B.1: Specification of Transparent Containers referenced in RANAP.
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]).
Annex D (informative):
Change History

<table>
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<th>TSG Doc.</th>
<th>CR</th>
<th>Rev</th>
<th>Subject/Comment</th>
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