

**TSG RAN Meeting #20**  
**Hämeenlinna, Finland, 3 - 6 June, 2003**

**RP-030339**

**Title** CRs (R99 and Rel-4/Rel-5 Category A) to TS 25.413 on Introduction of Early UE Handling – Bitmap Option  
**Source** TSG RAN WG3  
**Agenda Item** 8.1.5

**Note: TSG RAN is requested to decide: a. which Early UE option and b. starting from which release.**

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-030853	25.413	3.12.0	3.13.0	R99	565	2	F	Introduction of Early UE Handling – Bitmap Option	RANimp-FSEarlyUE
R3-030854	25.413	4.8.0	4.9.0	REL-4	566	2	A	Introduction of Early UE Handling – Bitmap Option	RANimp-FSEarlyUE
R3-030855	25.413	5.4.0	5.5.0	REL-5	573	2	A	Introduction of Early UE Handling – Bitmap Option	RANimp-FSEarlyUE

3GPP TSG-RAN3 Meeting #36  
Paris, France, 19<sup>th</sup>-23<sup>rd</sup> May 2003

Tdoc #R3-030853

CR-Form-v7

## CHANGE REQUEST

⌘ 25.413 CR 565 ⌘ rev 2 ⌘ Current version: 3.12.0 ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Introduction of Early UE Handling – Bitmap Option		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ RANimp-FSEarlyUE	<b>Date:</b>	⌘ 22/05/2003
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ It has been agreed at RAN Adhoc on Early UE Handling feature to transfer the UESBI information over the lu interface. There is currently no cause value in RANAP to indicate that the RNC cannot support incoming relocation from 2G for a given UE due to early UE handling.
<b>Summary of change:</b>	⌘ The UESBI (UE Specific Behaviour Information) is transferred over the lu interface as a bit string. A new class 2 procedure is introduced to transfer it when it is not possible via Common-Id message. A new cause value is introduced to deal with the case of early UE handling in 2g-3g handover.  <u>Impact assessment towards the previous version of the specification (same release):</u>  This CR has isolated impact towards the previous version of the specification (same release).  This CR has an impact under protocol and functional point of view.  The impact can be considered isolated because it only affects the common-id and the relocation resource allocation system functions.
<b>Consequences if not approved:</b>	⌘ Mechanisms for handling of Early UEs cannot be supported.

**Clauses affected:** ⌘ 2, 3, 8.1, 8.7, 8.16, 8.29a (new), 9.1.10, 9.1.24, 9.1.45a (new), 9.2.1.4, 9.2.1.42a (new), 9.3.2, 9.3.3, 9.3.4, 9.3.6.

Y  N

<b>Other specs</b>	⌘	X	Other core specifications	⌘	TS25.413 REL-4 CR566r2 TS25.413 REL-5 CR573r2
<b>affected:</b>			X	Test specifications	
			X	O&M Specifications	
<b>Other comments:</b>	⌘				

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## 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: "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 08.08: "Mobile services Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".
- [12] 3GPP TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (12/1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (12/1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (12/1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "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 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

- [23] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [24] 3GPP TS 12.20: "Base Station System (BSS) management information".
- [25] [3GPP TR 25.994: "Measures employed by the UMTS Radio Access Network \(UTRAN\) to overcome early User Equipment \(UE\) implementation faults"](#)
- [26] [3GPP TR 25.995: "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"](#)
- [27] [3GPP TS 23.195: "Provision of UE Specific Behaviour Information to Network Entities"](#)

---

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

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

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

**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.

[PUESBINE feature: as defined in \[27\].](#)

**Serving RNS (SRNS):** 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

**Serving RNC (SRNC):** SRNC is the RNC belonging to SRNS

**SRNC-ID:** See [3] for definition

**S-RNTI:** See [3] for definition

**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

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

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

[UE Specific Behaviour Information – Iu \(UESBI-Iu\): as defined in \[27\].](#)

**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 [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.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAL2	ATM Adaptation Layer type 2
AS	Access Stratum
ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
CC	Call Control
CN	Core Network
CRNC	Controlling RNC
CS	Circuit Switched
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel
EP	Elementary Procedure
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
MM	Mobility Management
MSC	Mobile services Switching Center

NAS	Non Access Stratum
N-PDU	Network - Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PPP	Point-to-Point Protocol
PS	Packet Switched
<a href="#">PUESBINE</a>	<a href="#">Provision of UE Specific Behaviour Information to Network Entities</a>
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
SAI	Service Area Identifier
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SRNC	Serving RNC
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
<a href="#">UESBI-Iu</a>	<a href="#">UE Specific Behaviour Information - Iu</a>
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network



## 8.1 Elementary Procedures

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

**Table 1: Class 1**

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Iu Release	IU RELEASE COMMAND	IU RELEASE COMPLETE	
Relocation Preparation	RELOCATION REQUIRED	RELOCATION COMMAND	RELOCATION PREPARATION FAILURE
Relocation Resource Allocation	RELOCATION REQUEST	RELOCATION REQUEST ACKNOWLEDGE	RELOCATION FAILURE
Relocation Cancel	RELOCATION CANCEL	RELOCATION CANCEL ACKNOWLEDGE	
SRNS Context Transfer	SRNS CONTEXT REQUEST	SRNS CONTEXT RESPONSE	
Security Mode Control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	SECURITY MODE REJECT
Data Volume Report	DATA VOLUME REPORT REQUEST	DATA VOLUME REPORT	
Reset	RESET	RESET ACKNOWLEDGE	
Reset Resource	RESET RESOURCE	RESET RESOURCE ACKNOWLEDGE	

**Table 2: Class 2**

Elementary Procedure	Message
RAB Release Request	RAB RELEASE REQUEST
Iu Release Request	IU RELEASE REQUEST
Relocation Detect	RELOCATION DETECT
Relocation Complete	RELOCATION COMPLETE
SRNS Data Forwarding Initiation	SRNS DATA FORWARD COMMAND
SRNS Context Forwarding from Source RNC to CN	FORWARD SRNS CONTEXT
SRNS Context Forwarding to Target RNC from CN	FORWARD SRNS CONTEXT
Paging	PAGING
Common ID	COMMON ID
CN Invoke Trace	CN INVOKE TRACE
CN Deactivate Trace	CN DEACTIVATE TRACE
Location Reporting Control	LOCATION REPORTING CONTROL
Location Report	LOCATION REPORT
Initial UE Message	INITIAL UE MESSAGE
Direct Transfer	DIRECT TRANSFER
Overload Control	OVERLOAD
Error Indication	ERROR INDICATION
<a href="#">UE Specific Information</a>	<a href="#">UE SPECIFIC INFORMATION INDICATION</a>

**Table 3: Class 3**

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

The following applies concerning interference between Elementary Procedures:

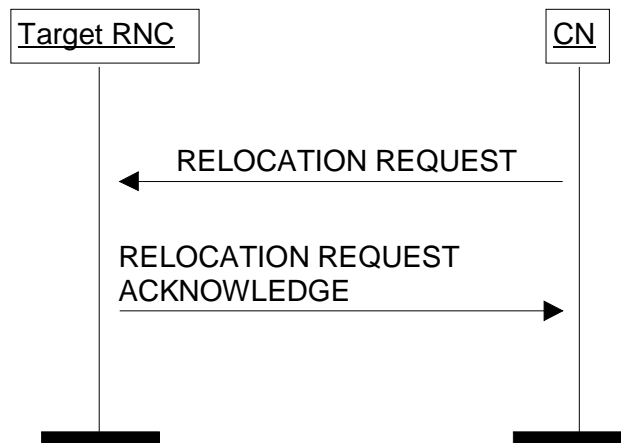
- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

## 8.7 Relocation Resource Allocation

### 8.7.1 General

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

### 8.7.2 Successful Operation



**Figure 7: Relocation Resource Allocation procedure. Successful operation.**

The CN shall initiate the procedure by generating RELOCATION REQUEST message. In a UTRAN to UTRAN relocation, this message shall contain the information (if any) required by the UTRAN to build the same set of RABs as existing for the UE before the relocation.

The CN shall transmit the RELOCATION REQUEST message to target RNC and the CN shall start the timer  $T_{RELOCalloc}$ .

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

The RELOCATION REQUEST message shall contain following IEs

- *Permanent NAS UE Identity* (if available)
- *Cause*
- *CN Domain Indicator*
- *Source RNC To Target RNC Transparent Container*
- *Iu Signalling Connection Identifier*
- ~~Integrity Protection Information~~ (if available)
- [UESBI-Iu](#) (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 following IEs:

- *RAB-ID*
- *NAS Synchronisation Indicator* (if the relevant NAS information is provided by the CN)
- *RAB parameters*

- *User Plane Information*
- *Transport Layer Address*
- *Iu Transport Association*
- *Data Volume Reporting Indication* (only for PS)
- *PDP Type Information* (only for PS)

The RELOCATION REQUEST message may include following IEs:

- *Encryption Information* (shall not be included if the *Integrity Protection Information* IE is not included)

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

- *Service Handover*

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
- User plane Information
- Priority level, queuing and pre-emption indication
- Service Handover

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”.

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

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, and which the RNC is required to store and remember for the duration of the Iu connection.

[The RNC shall, if supported, use the UESBI-Iu IE when included in the RELOCATION REQUEST message.](#)

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

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

In case of intra-system relocation, if no *Integrity Protection Key* IE (*Encryption 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 *Encryption 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 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* from the RELOCATION REQUEST messages over the Iu interface.

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

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

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

- 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 does 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 target RNC, the radio bearers shall be ignored during the relocation of SRNS and the radio bearers shall be released by radio interface protocols after completion of relocation of SRNS.

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

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

- *RAB ID*
- *Transport Layer Address* (only for PS)
- *Iu Transport Association* (only for PS)

For each RAB the RNC is not able to setup during Relocation Resource Allocation 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 CN to the source RNC or the external relocation source while completing the Relocation Preparation procedure.

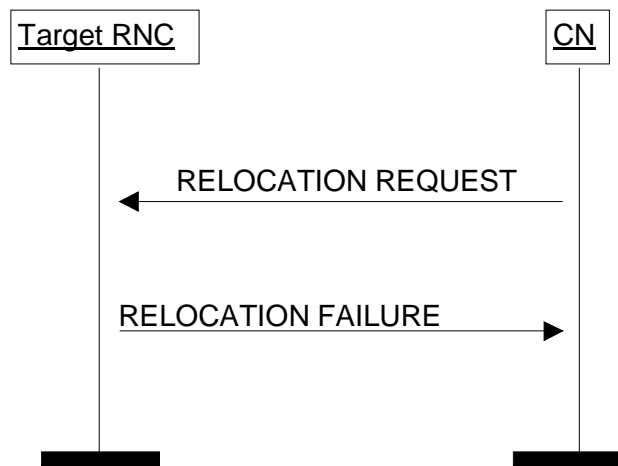
The RNC shall include the *Chosen Integrity Protection Algorithm IE* (*Chosen Encryption Algorithm IE* respectively) within the RELOCATION REQUEST ACKNOWLEDGE message, if, and only if the *Integrity Protection Information IE* (*Encryption Information IE* respectively) was included in the RELOCATION REQUEST message.

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.

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

### 8.7.3 Unsuccessful Operation



**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 RELOCATION FAILURE message to the CN.

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".](#)

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

When CN has received RELOCATION FAILURE message from target RNC, CN shall stop timer  $T_{RELOCalloc}$  and shall assume possibly allocated resources within target RNC completely released.

### 8.7.4 Abnormal Conditions

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

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

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

#### **Interactions with Iu Release procedure:**

If the CN decides to not continue the Relocation Resource Allocation procedure (e.g. due to  $T_{RELOCalloc}$  expiry) before the Relocation Resource Allocation procedure is completed, the CN shall stop timer  $T_{RELOCalloc}$  (if timer  $T_{RELOCalloc}$  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".

## 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 the 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 the 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 by each CN domain within RELOCATION REQUEST message, to co-ordinate both Iu signalling connections.
- The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE message 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.

## 8.16 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 uses connection oriented signalling.

### 8.16.2 Successful Operation



**Figure 17: Common ID procedure. Successful operation.**

After having established an Iu signalling connection, and if the Permanent NAS UE identity (i.e. IMSI) is available, the CN shall send a COMMON ID message, containing the *Permanent NAS UE Identity* IE to the RNC. [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.](#)

### 8.16.3 Abnormal Conditions

Not applicable.



## 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

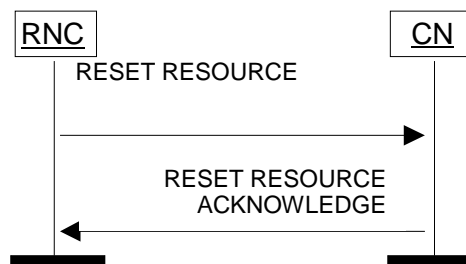
Void.

#### 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



**Figure 34: RNC initiated Reset Resource procedure. Successful operation.**

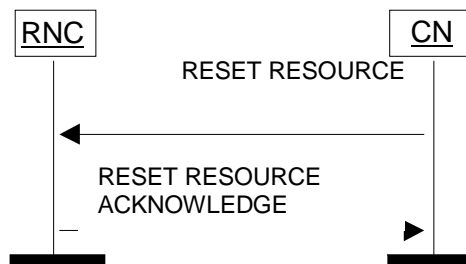
The RNC initiates this procedure by sending a RESET RESOURCE message to the CN.

The RESET RESOURCE message shall include the *CN Domain Indicator IE*, the *Global RNC-ID IE*, the *Cause IE* with 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.

Both CN and 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



**Figure 35: CN initiated Reset Resource procedure. Successful operation.**

The CN initiates this 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 appropriate cause value (e.g. "Signalling Transport Resource Failure") and a list containing *Iu Signalling Connection Identifier* IEs.

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 Iu signalling connection identifiers indicated in the received message. The *Global RNC-ID* IE shall not be included in the RESET RESOURCE message. 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 RNC and 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.

## 8.29a UE Specific Information

### 8.29a.1 General

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

The procedure uses connection oriented signalling.

### 8.29a.2 Successful Operation



**Figure 17: UE Specific Information procedure. 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.

## 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.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Permanent NAS UE Identity	O		9.2.3.1		YES	ignore
Cause	M		9.2.1.4		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	reject
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
<b>RABs To Be Setup List</b>	O				YES	reject
<b>&gt;RABs To Be Setup Item IEs</b>		1 to <maxnoofRABs>			EACH	reject
>>RAB ID	M		9.2.1.2		-	
>>NAS Synchronisation Indicator	O		9.2.3.18		-	
>>RAB Parameters	M		9.2.1.3		-	
>>Data Volume Reporting Indication	C – ifPS		9.2.1.17		-	
>> PDP Type Information	C – ifPS		9.2.1.40		-	
<b>&gt;&gt;User Plane Information</b>	M				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		-	
>>Transport Layer Address	M		9.2.2.1		-	
>>Iu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
Integrity Protection Information	O		9.2.1.11	Integrity Protection Information includes key and permitted algorithms.	YES	ignore
Encryption Information	O		9.2.1.12	Encryption Information includes key and permitted algorithms.	YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
<a href="#">UESBI-Iu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

Condition	Explanation
IfPS	This IE shall be present if the <i>CN domain indicator</i> IE is set to "PS domain".

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

## 9.1.24 COMMON ID

This message is sent by the CN to inform RNC about the permanent NAS UE identity for a user.

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		YES	ignore
Permanent NAS UE Identity	M		9.2.3.1		YES	ignore
<a href="#">UESBI-Iu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

## 9.1.45 RESET RESOURCE ACKNOWLEDGE

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

Direction: CN  $\leftrightarrow$  RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
CN Domain Indicator	M		9.2.1.5		YES	reject
<b>Reset Resource List</b>	M				YES	ignore
<b>&gt;Reset Resource Item IEs</b>		1 to <maxnoofluSigConIds>		This list shall be in the same order as the list received in the RESET RESOURCE message.	EACH	reject
>>lu Signalling Connection Identifier	M		9.2.1.38		-	
Global RNC-ID	O		9.2.1.39		YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore

Range bound	Explanation
maxnoofluSigConIds	Maximum no. of lu signalling connection identifiers. Value is 250.

### 9.1.45a UE SPECIFIC INFORMATION INDICATION

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

Direction: CN  $\rightarrow$  RNC.

Signalling bearer mode: Connection oriented.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>	<u>Criticality</u>	<u>Assigned Criticality</u>
<u>Message Type</u>	<u>M</u>		<u>9.2.1.1</u>		<u>YES</u>	<u>ignore</u>
<u>UESBI-lu</u>	<u>O</u>		<u>9.2.1.42a</u>		<u>YES</u>	<u>ignore</u>

#### 9.2.1.4 Cause

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing 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	Value range is 1 – 64.



IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			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), lu UP Failure(28), TRELOAlloc Expiry (7), Relocation Failure	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46),</p> <p><a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature(56)</a></p> <p>...)</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<b>Choice Cause</b>				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66),  ...)	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83),  ...)	Value range is 81 – 96.
>Protocol Cause			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),  ...)	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) ,	Value range is 113 – 128.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			...)	
>Non-standard Cause			INTEGER (...)	Value range is 129 – 256. Cause value 256 shall not be used.

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

Radio Network Layer cause	Meaning
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
<a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature</a>	<a href="#">The incoming relocation cannot be accepted by the target RNC because of the PUESBINE feature.</a>
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not Available	The action failed because requested maximum bit rate is not available.
Requested Request Type Not Supported	The RNC is not supporting the requested location request type either because it doesn't support the requested event or it doesn't support the requested report area.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.

Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.
Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity.
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.

Transport Layer cause	Meaning
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed (e.g. processor reset).

NAS cause	Meaning
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

Protocol cause	Meaning
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Transfer Syntax Error	The received message included a transfer syntax error.

Miscellaneous cause	Meaning
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.

### 9.2.1.42 Message Structure

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

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

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

#### [9.2.1.42a UESBI-Iu](#)

[The purpose of the UESBI-Iu IE is to transfer the UE Specific Behaviour Information as defined in \[25\] and \[26\] from the CN to the RNC.](#)

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
<u>UESBI-Iu</u>				
<u>&gt;UESBI-IuA</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuA</i> provides compliance status information about the UE with regards to specific behaviours described in [25].</p> <p>[25] defines the mapping between the descriptions in [25] and the <i>UESBI-IuA</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [25].</p>
<u>&gt;UESBI-IuB</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuB</i> provides compliance status information about the UE with regards to specific behaviours described in [26].</p> <p>[26] defines the mapping between the descriptions in [26] and the <i>UESBI-IuB</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [26].</p>



## 9.3.2 Elementary Procedure Definitions

```

-- *****
--
-- 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,
    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,
    PrivateMessage,
    ResetResource,
    ResetResourceAcknowledge,
    RANAP-RelocationInformation,
    UESpecificInformationIndication
FROM RANAP-PDU-Contents

    id-CN-DeactivateTrace,
    id-CN-InvokeTrace,
    id-CommonID,
    id-DataVolumeReport,
    id-DirectTransfer,
    id-ErrorIndication,
    id-ForwardSRNS-Context,
    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-RANAP-Relocation,
id-RelocationCancel,
id-RelocationComplete,
id-RelocationDetect,
id-RelocationPreparation,
id-RelocationResourceAllocation,
id-Reset,
id-SRNS-ContextTransfer,
id-SRNS-DataForward,
id-SecurityModeControl,
id-ResetResource,
id-UESpecificInformation
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.2 not shown

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-2 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-ReleaseRequest      |
  iu-ReleaseRequest      |
  relocationDetect        |
  relocationComplete      |
  paging                  |
  commonID                |
  cN-InvokeTrace          |
  cN-DeactivateTrace     |
  locationReportingControl |
  locationReport          |
  initialUE-Message      |
  directTransfer          |
  overloadControl         |
  errorIndication        |
  sRNS-DataForward       |
  forwardSRNS-Context    |
  privateMessage         |
  rANAP-Relocation       |
  ...
  uESpecificInformation
}

```

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-3 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-Assignment
  ...
}

```

```

-- *****
--
-- Interface Elementary Procedures
--
-- *****

```

```

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
}

uESpecificInformation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  uESpecificInformationIndication
  PROCEDURE CODE      id-uESpecificInformation
  CRITICALITY         ignore
}

```

END

### 9.3.3 PDU Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    DataVolumeReference,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GlobalRNC-ID,
    IntegrityProtectionInformation,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
    L3-Information,
    LAI,
    NAS-PDU,
    NAS-SynchronisationIndicator,
    NonSearchingIndication,
    NumberOfSteps,
    OMC-ID,
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    RAB-ID,
    RAB-Parameters,
    RAC,
    RelocationType,
    RequestType,
    SAI,
    SAPI,
    Service-Handover,
    SourceID,
    SourceRNC-ToTargetRNC-TransparentContainer,
    TargetID,
    TargetRNC-ToSourceRNC-TransparentContainer,
    TemporaryUE-ID,
    TraceReference,
    TraceType,
    UnsuccessfullyTransmittedDataVolume,
    TransportLayerAddress,
    TriggerID,
    UE-ID,
    UESBI-Iu,
    UL-GTP-PDU-SequenceNumber,
    UL-N-PDU-SequenceNumber,
    UP-ModeVersions,
    UserPlaneMode
FROM RANAP-IEs

```

```

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

maxNrOfDTs,
maxNrOfErrors,
maxNrOfIuSigConIds,
maxNrOfRABs,
maxNrOfVol,

id-AreaIdentity,
id-CN-DomainIndicator,
id-Cause,
id-ChosenEncryptionAlgorithm,
id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
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-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,

```

```

id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-SAI,
id-SAPL,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UESBI-Iu,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Relocation Request
--
-- *****

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

RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE optional } |
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                PRESENCE
    mandatory } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator
    PRESENCE mandatory } |
    { ID id-SourceRNC-ToTargetRNC-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 ::= {
    ...
}

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 99 to enable specific behaviour by the RNC in relation with early UE
handling --
{ ID id-UESBI-Iu CRITICALITY ignore EXTENSION UESBI-Iu PRESENCE optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- COMMON ID ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Common ID
--
-- *****

CommonID ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {CommonID-IEs} },
    protocolExtensions    ProtocolExtensionContainer { {CommonIDExtensions} }
    OPTIONAL,
    ...
}

CommonID-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore TYPE PermanentNAS-UE-ID
    PRESENCE mandatory },
    ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable specific behaviour by the RNC in relation with early UE
handling --
{ ID id-UESBI-Iu CRITICALITY ignore EXTENSION UESBI-Iu PRESENCE optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- RANAP RELOCATION INFORMATION ELEMENTARY PROCEDURE
--
-- *****

RANAP-RelocationInformation ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {RANAP-RelocationInformationIEs} },
    protocolExtensions    ProtocolExtensionContainer { {RANAP-RelocationInformationExtensions} }
    OPTIONAL,
    ...
}

```

```

RANAP-RelocationInformationIEs RANAP-PROTOCOL-IES ::= {
  { ID id-DirectTransferInformationList-RANAP-RelocInf
    CRITICALITY ignore TYPE DirectTransferInformationList-RANAP-RelocInf
    PRESENCE optional } |
  { ID id-RAB-ContextList-RANAP-RelocInf CRITICALITY ignore TYPE RAB-ContextList-RANAP-
RelocInf PRESENCE optional },
  ...
}

DirectTransferInformationList-RANAP-RelocInf ::= DirectTransfer-IE-ContainerList {
{DirectTransferInformationItemIEs-RANAP-RelocInf} }

DirectTransferInformationItemIEs-RANAP-RelocInf RANAP-PROTOCOL-IES ::= {
  { ID id-DirectTransferInformationItem-RANAP-RelocInf
    CRITICALITY ignore TYPE DirectTransferInformationItem-RANAP-RelocInf
    PRESENCE mandatory },
  ...
}

DirectTransferInformationItem-RANAP-RelocInf ::= SEQUENCE {
  nAS-PDU NAS-PDU,
  sAPI SAPI,
  cN-DomainIndicator CN-DomainIndicator,
  iE-Extensions ProtocolExtensionContainer { {RANAP-
DirectTransferInformationItem-ExtIEs-RANAP-RelocInf} } OPTIONAL,
  ...
}

RANAP-DirectTransferInformationItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

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

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

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

RAB-ContextItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

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

-- *****
--
-- UE SPECIFIC INFORMATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- UE Specific Information Indication
--
-- *****

UESpecificInformationIndication ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {UESpecificInformationIndicationIEs} },
  protocolExtensions ProtocolExtensionContainer { {UESpecificInformationIndicationExtensions} }
} OPTIONAL,
  ...
}

UESpecificInformationIndicationIEs RANAP-PROTOCOL-IES ::= {
  { ID id-UESBI-Iu CRITICALITY ignore TYPE UESBI-Iu PRESENCE
optional },

```

.....  
}

UESpecificInformationIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {

.....  
}

END

## 9.3.4 Information Element Definitions

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

RANAP-IEs {
itu-t (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
    maxNrOfErrors,
    maxNrOfPDPDirections,
    maxNrOfPoints,
    maxNrOfRABs,
    maxNrOfSRBs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination,
    maxNrOfLevels,

    id-CN-DomainIndicator,
    id-MessageStructure,
    id-SRB-TrCH-Mapping,
    id-TypeOfError

FROM RANAP-Constants

    Criticality,
    ProcedureCode,
    ProtocolIE-ID,
    TriggeringMessage
FROM RANAP-CommonDataTypes

    ProtocolExtensionContainer{},
    RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;
```

Lots of unaffected ASN1 in 9.3.4 not shown
--

```
CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    trellocalloc-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),
incoming-relocation-not-supported-due-to-PUESBINE-feature (56)
} (1..64)

```

Lots of unaffected ASN1 in 9.3.4 not shown

```
-- U
```

```

UE-ID ::= CHOICE {
    imsi             IMSI,
    imei             IMEI,
    ...
}

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)

UP-ModeVersions ::= BIT STRING (SIZE (16))

USCH-ID ::= INTEGER (0..255)

UserPlaneMode ::= ENUMERATED {
    transparent-mode,
    support-mode-for-predefined-SDU-sizes,
    ...
}

END

```

## 9.3.6 Constant Definitions

```

-- *****
--
-- Constant definitions
--
-- *****

RANAP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- Elementary Procedures
--
-- *****

id-RAB-Assignment                INTEGER ::= 0
id-Iu-Release                    INTEGER ::= 1
id-RelocationPreparation         INTEGER ::= 2
id-RelocationResourceAllocation INTEGER ::= 3
id-RelocationCancel             INTEGER ::= 4
id-SRNS-ContextTransfer         INTEGER ::= 5
id-SecurityModeControl          INTEGER ::= 6
id-DataVolumeReport            INTEGER ::= 7
id-Reset                        INTEGER ::= 9
id-RAB-ReleaseRequest           INTEGER ::= 10
id-Iu-ReleaseRequest            INTEGER ::= 11
id-RelocationDetect             INTEGER ::= 12
id-RelocationComplete          INTEGER ::= 13
id-Paging                      INTEGER ::= 14
id-CommonID                    INTEGER ::= 15
id-CN-InvokeTrace              INTEGER ::= 16
id-LocationReportingControl     INTEGER ::= 17
id-LocationReport              INTEGER ::= 18
id-InitialUE-Message           INTEGER ::= 19
id-DirectTransfer              INTEGER ::= 20
id-OverloadControl             INTEGER ::= 21
id-ErrorIndication             INTEGER ::= 22
id-SRNS-DataForward            INTEGER ::= 23
id-ForwardSRNS-Context         INTEGER ::= 24
id-privateMessage              INTEGER ::= 25
id-CN-DeactivateTrace          INTEGER ::= 26
id-ResetResource               INTEGER ::= 27
id-RANAP-Relocation            INTEGER ::= 28
id-UESpecificInformation        INTEGER ::= 32

-- *****
--
-- Extension constants
--
-- *****

maxPrivateIEs                   INTEGER ::= 65535
maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs                 INTEGER ::= 65535

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

maxNrOfDTs                     INTEGER ::= 15
maxNrOfErrors                   INTEGER ::= 256
maxNrOfIuSigConIds             INTEGER ::= 250
maxNrOfPDPDirections           INTEGER ::= 2
maxNrOfPoints                   INTEGER ::= 15
maxNrOfRABs                     INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfSRBs                     INTEGER ::= 8
maxNrOfVol                      INTEGER ::= 2
maxNrOfLevels                   INTEGER ::= 256

maxRAB-Subflows                INTEGER ::= 7

```

```

maxRAB-SubflowCombination          INTEGER ::= 64

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

id-AreaIdentity                     INTEGER ::= 0
id-CN-DomainIndicator               INTEGER ::= 3
id-Cause                             INTEGER ::= 4
id-ChosenEncryptionAlgorithm         INTEGER ::= 5
id-ChosenIntegrityProtectionAlgoritm INTEGER ::= 6
id-ClassmarkInformation2             INTEGER ::= 7
id-ClassmarkInformation3            INTEGER ::= 8
id-CriticalityDiagnostics            INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber        INTEGER ::= 10
id-EncryptionInformation             INTEGER ::= 11
id-IntegrityProtectionInformation    INTEGER ::= 12
id-IuTransportAssociation            INTEGER ::= 13
id-L3-Information                    INTEGER ::= 14
id-LAI                               INTEGER ::= 15
id-NAS-PDU                           INTEGER ::= 16
id-NonSearchingIndication            INTEGER ::= 17
id-NumberOfSteps                     INTEGER ::= 18
id-OMC-ID                             INTEGER ::= 19
id-OldBSS-ToNewBSS-Information      INTEGER ::= 20
id-PagingAreaID                     INTEGER ::= 21
id-PagingCause                       INTEGER ::= 22
id-PermanentNAS-UE-ID               INTEGER ::= 23
id-RAB-ContextItem                  INTEGER ::= 24
id-RAB-ContextList                  INTEGER ::= 25
id-RAB-DataForwardingItem           INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList           INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem         INTEGER ::= 30
id-RAB-DataVolumeReportList         INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem  INTEGER ::= 32
id-RAB-DataVolumeReportRequestList  INTEGER ::= 33
id-RAB-FailedItem                   INTEGER ::= 34
id-RAB-FailedList                   INTEGER ::= 35
id-RAB-ID                           INTEGER ::= 36
id-RAB-QueuedItem                   INTEGER ::= 37
id-RAB-QueuedList                   INTEGER ::= 38
id-RAB-ReleaseFailedList            INTEGER ::= 39
id-RAB-ReleaseItem                  INTEGER ::= 40
id-RAB-ReleaseList                  INTEGER ::= 41
id-RAB-ReleasedItem                 INTEGER ::= 42
id-RAB-ReleasedList                 INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp        INTEGER ::= 44
id-RAB-RelocationReleaseItem         INTEGER ::= 45
id-RAB-RelocationReleaseList         INTEGER ::= 46
id-RAB-SetupItem-RelocReq            INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck         INTEGER ::= 48
id-RAB-SetupList-RelocReq            INTEGER ::= 49
id-RAB-SetupList-RelocReqAck         INTEGER ::= 50
id-RAB-SetupOrModifiedItem           INTEGER ::= 51
id-RAB-SetupOrModifiedList           INTEGER ::= 52
id-RAB-SetupOrModifyItem             INTEGER ::= 53
id-RAB-SetupOrModifyList             INTEGER ::= 54
id-RAC                               INTEGER ::= 55
id-RelocationType                   INTEGER ::= 56
id-RequestType                       INTEGER ::= 57
id-SAI                               INTEGER ::= 58
id-SAPI                              INTEGER ::= 59
id-SourceID                          INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer INTEGER ::= 61
id-TargetID                          INTEGER ::= 62
id-TargetRNC-ToSourceRNC-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-TypeOfError	INTEGER ::= 93
id-SRB-TrCH-Mapping	INTEGER ::= 98
<u>id-UESBI-Iu</u>	<u>INTEGER ::= 118</u>

END



3GPP TSG-RAN3 Meeting #36  
 Paris, France, 19<sup>th</sup>-23<sup>rd</sup> May 2003

Tdoc #R3-030854

CR-Form-v7

# CHANGE REQUEST

⌘ **25.413 CR 566** ⌘ rev **2** ⌘ Current version: **4.8.0** ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Introduction of Early UE Handling – Bitmap Option		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ RANimp-FSEarlyUE	<b>Date:</b>	⌘ 22/05/2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)	

<b>Reason for change:</b>	⌘ It has been agreed at RAN Adhoc on Early UE Handling feature to transfer the UESBI information over the lu interface. There is currently no cause value in RANAP to indicate that the RNC cannot support incoming relocation from 2G for a given UE due to early UE handling.
<b>Summary of change:</b>	⌘ The UESBI (UE Specific Behaviour Information) is transferred over the lu interface as a bit string. A new class 2 procedure is introduced to transfer it when it is not possible via Common-Id message. A new cause value is introduced to deal with the case of early UE handling in 2g-3g handover.  <u>Impact assessment towards the previous version of the specification (same release):</u>  This CR has isolated impact towards the previous version of the specification (same release).  This CR has an impact under protocol and functional point of view.  The impact can be considered isolated because it only affects the common-id and the relocation resource allocation system functions.
<b>Consequences if not approved:</b>	⌘ Mechanisms for handling of Early UEs cannot be supported.

<b>Clauses affected:</b>	⌘ 2, 3, 8.1, 8.7, 8.16, 8.29a (new), 9.1.10, 9.1.24, 9.1.45a (new), 9.2.1.4, 9.2.1.42a (new), 9.3.2, 9.3.3, 9.3.4, 9.3.6.
<input type="checkbox"/> Y <input type="checkbox"/> N	

<b>Other specs</b>	⌘	X	Other core specifications	⌘	TS25.413 R99 CR565r2 TS25.413 REL-5 CR573r2
<b>affected:</b>			Test specifications		
			O&M Specifications		
<b>Other comments:</b>	⌘				

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## 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".

- [1] 3GPP TR 23.930: "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 08.08: "Mobile services Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".
- [12] 3GPP TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".
- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [25] 3GPP TS 12.20: "Base Station System (BSS) management information".
- [26] 3GPP TS 22.071: "Location Services (LCS); Service description - Stage 1".
- [27] [3GPP TR 25.994: "Measures employed by the UMTS Radio Access Network \(UTRAN\) to overcome early User Equipment \(UE\) implementation faults"](#)
- [28] [3GPP TR 25.995: "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"](#)
- [29] [3GPP TS 23.195: "Provision of UE Specific Behaviour Information to Network Entities"](#)

---

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

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

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

**Default CN node:** An RNC has one single permanent default CN node per CN domain. It always initiates the Initial UE Message procedure towards its default CN node.

**PUESBINE feature:** as defined in [29].

**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.

**Serving RNS (SRNS):** 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

**Serving RNC (SRNC):** SRNC is the RNC belonging to SRNS

**SRNC-ID:** see [3] for definition

**S-RNTI:** see [3] for definition

**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

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

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

**UE Specific Behaviour Information – Iu (UESBI-Iu):** as defined in [29].

**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 [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.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAAL2	ATM Adaptation Layer type 2
AS	Access Stratum
ASN.1	Abstract Syntax Notation One

ATM	Asynchronous Transfer Mode
CC	Call Control
CN	Core Network
CRNC	Controlling RNC
CS	Circuit Switched
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel
EP	Elementary Procedure
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
MM	Mobility Management
MSC	Mobile services Switching Center
NAS	Non Access Stratum
N-PDU	Network – Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PPP	Point-to-Point Protocol
PS	Packet Switched
<a href="#">PUESBINE</a>	<a href="#">Provision of UE Specific Behaviour Information to Network Entities</a>
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
SAI	Service Area Identifier
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SRNC	Serving RNC
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
<a href="#">UESBI-Iu</a>	<a href="#">UE Specific Behaviour Information - Iu</a>
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

## 8.1 Elementary Procedures

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

**Table 1: Class 1**

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Iu Release	IU RELEASE COMMAND	IU RELEASE COMPLETE	
Relocation Preparation	RELOCATION REQUIRED	RELOCATION COMMAND	RELOCATION PREPARATION FAILURE
Relocation Resource Allocation	RELOCATION REQUEST	RELOCATION REQUEST ACKNOWLEDGE	RELOCATION FAILURE
Relocation Cancel	RELOCATION CANCEL	RELOCATION CANCEL ACKNOWLEDGE	
SRNS Context Transfer	SRNS CONTEXT REQUEST	SRNS CONTEXT RESPONSE	
Security Mode Control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	SECURITY MODE REJECT
Data Volume Report	DATA VOLUME REPORT REQUEST	DATA VOLUME REPORT	
Reset	RESET	RESET ACKNOWLEDGE	
Reset Resource	RESET RESOURCE	RESET RESOURCE ACKNOWLEDGE	
Location related Data	LOCATION RELATED DATA REQUEST	LOCATION RELATED DATA RESPONSE	LOCATION RELATED DATA FAILURE

**Table 2: Class 2**

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

**Table 3: Class 3**

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

The following applies concerning interference between Elementary Procedures:

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

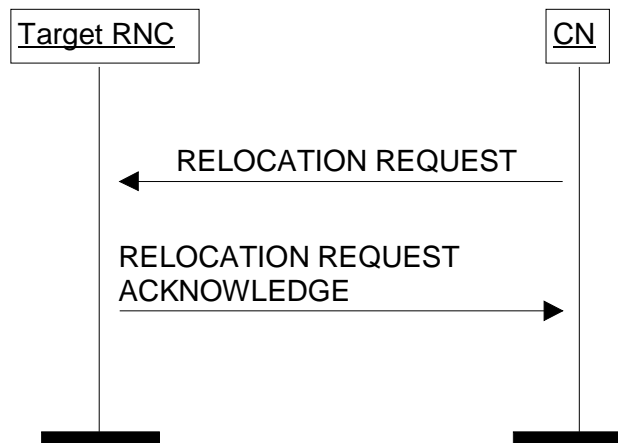


## 8.7 Relocation Resource Allocation

### 8.7.1 General

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

### 8.7.2 Successful Operation



**Figure 7: Relocation Resource Allocation procedure. Successful operation.**

The CN shall initiate the procedure by generating RELOCATION REQUEST message. In a UTRAN to UTRAN relocation, this message shall contain the information (if any) required by the UTRAN to build the same set of RABs as existing for the UE before the relocation. 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 CN shall transmit the RELOCATION REQUEST message to target RNC and the CN shall start the timer  $T_{RELOCalloc}$ .

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

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

The RELOCATION REQUEST message shall contain following IEs

- *Permanent NAS UE Identity* IE (if available)
- *Cause*
- *CN Domain Indicator*
- *Source RNC To Target RNC Transparent Container*
- *Iu Signalling Connection Identifier*
- ~~Integrity Protection Information~~ IE (if available)
- [UESBI-Iu](#) (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 following IEs:

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

The RELOCATION REQUEST message may include following IEs:

- *Encryption Information* (shall not be included if the *Integrity Protection Information IE* is not included)

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

- *Service Handover*.
- *Alternative RAB Parameter Values*.

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*
- *User plane Information*(i.e. required User Plane Mode and required User Plane Versions)
- *Priority level, queuing and pre-emption indication*
- *Service Handover*

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”.

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

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 CN node involved. The RNC shall store and remember this identifier for the duration of the Iu connection.

[The RNC shall, if supported, use the UESBI-Iu IE when included in the RELOCATION REQUEST message.](#)

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

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

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 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 from the RELOCATION REQUEST messages over the Iu interface.

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.

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

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

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

- 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 does 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 target RNC, the radio bearers shall be ignored during the relocation of SRNS and the radio bearers shall be released by 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".

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

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

- *RAB ID*
- *Transport Layer Address* (only for PS)

- *Iu Transport Association* (only for PS)

For each RAB the RNC is not able to setup during Relocation Resource Allocation 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 CN to the source RNC or the external relocation source while completing the Relocation Preparation procedure.

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.

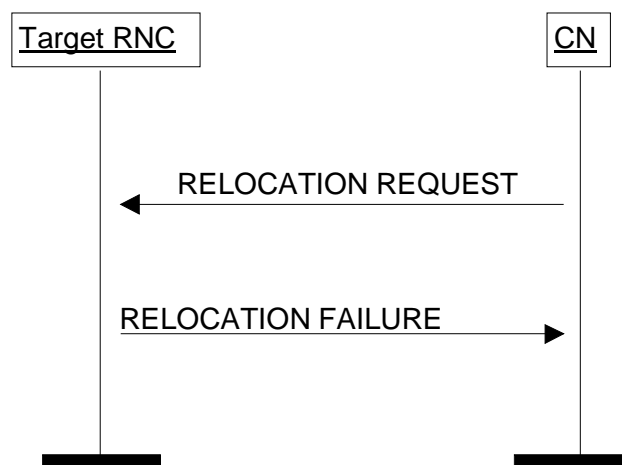
If one or more of the RABs that the target RNC has decided to support can not be supported by the CN, then these failed RABs shall not be released towards the target RNC until the relocation is completed.

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

Transmission and reception of RELOCATION REQUEST ACKNOWLEDGE message terminates the procedure in the UTRAN and 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 [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

### 8.7.3 Unsuccessful Operation



**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 RELOCATION FAILURE message to the CN.

If the target RNC cannot support any of the integrity protection (ciphering respectively) alternatives provided in the *Integrity Protection Information* IE (*Encryption Information* IE respectively), 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".

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

When CN has received RELOCATION FAILURE message from target RNC, CN shall stop timer  $T_{RELOCalloc}$  and shall assume possibly allocated resources within target RNC completely released.

## 8.7.4 Abnormal Conditions

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

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

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

### Interactions with Iu Release procedure:

If the CN decides to not continue the Relocation Resource Allocation procedure (e.g. due to  $T_{RELOCalloc}$  expiry) before the Relocation Resource Allocation procedure is completed, the CN shall stop timer  $T_{RELOCalloc}$  (if timer  $T_{RELOCalloc}$  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".

## 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 the 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 the 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 by each CN domain within RELOCATION REQUEST message, to co-ordinate both Iu signalling connections.
- The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE message 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.

## 8.16 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 uses connection oriented signalling.

### 8.16.2 Successful Operation



**Figure 17: Common ID procedure. Successful operation.**

After having established an Iu signalling connection, and if the Permanent NAS UE identity (i.e. IMSI) is available, the CN shall send a COMMON ID message, containing the *Permanent NAS UE Identity* IE to the RNC. [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.](#)

### 8.16.3 Abnormal Conditions

Not applicable.

## 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

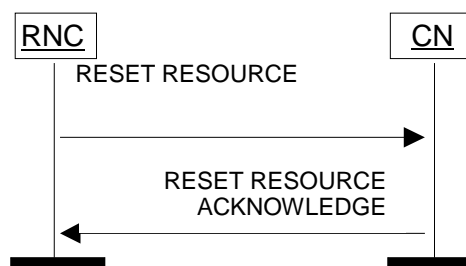
Void

#### 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



**Figure 34: RNC initiated Reset Resource procedure. Successful operation.**

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

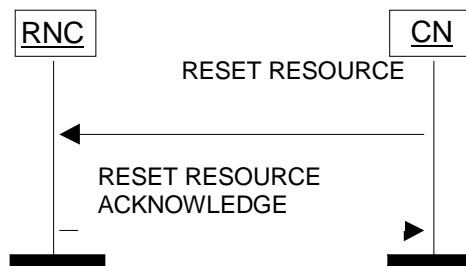
The RESET RESOURCE message shall include the *CN Domain Indicator IE*, the *Global RNC-ID IE*, the *Cause IE* with appropriate cause value (e.g. "Signalling Transport Resource Failure") and a list containing *Iu Signalling Connection Identifier IEs*.

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.

Both CN and 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



**Figure 35: CN initiated Reset Resource procedure. Successful operation.**

The CN initiates this 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 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 RNC and 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.

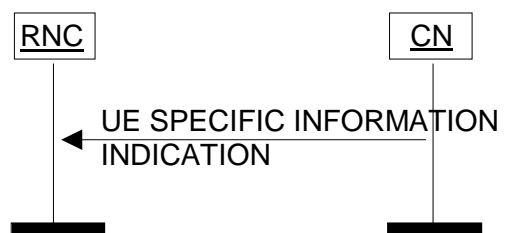
## 8.29a UE Specific Information

### 8.29a.1 General

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

The procedure uses connection oriented signalling.

### 8.29a.2 Successful Operation



**Figure 17: UE Specific Information procedure. Successful operation.**

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



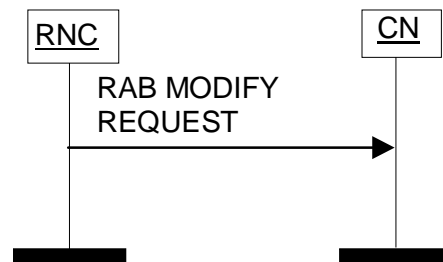
[The RNC shall, if supported, use the \*UESBI-It\* IE when received in the UE SPECIFIC INFORMATION INDICATION message.](#)

## 8.30 RAB Modification Request

### 8.30.1 General

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

### 8.30.2 Successful Operation



**Figure 36: RAB Modification procedure.**

The RNC shall initiate the procedure by generating a RAB MODIFY REQUEST message towards the CN and shall include a list of *RABs To Be Modified* IEs. For each RAB requested to be modified the *RABs To Be Modified Item* IE of the RAB MODIFY REQUEST message shall include the *RAB ID* IE, and the corresponding *Requested RAB Parameter Values* IE. The *Requested RAB Parameter Values* IE shall list those RAB parameters the RNC would like modified and the associated new RAB parameter values it is requesting. For any given RAB, RNC shall be able to propose modifications to any negotiable RAB parameters.

Upon reception of the RAB MODIFY REQUEST message, it is up to the CN to decide how to react to the request.

### 8.30.3 Abnormal Conditions

Not applicable.

## 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.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Permanent NAS UE Identity	O		9.2.3.1		YES	ignore
Cause	M		9.2.1.4		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	reject
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
<b>RABs To Be Setup List</b>	O				YES	reject
<b>&gt;RABs To Be Setup Item IEs</b>		1 to <maxnoofRABs>			EACH	reject
>>RAB ID	M		9.2.1.2		-	
>>NAS Synchronisation Indicator	O		9.2.3.18		-	
>>RAB Parameters	M		9.2.1.3		-	
>>Data Volume Reporting Indication	C – ifPS		9.2.1.17		-	
>> PDP Type Information	C – ifPS		9.2.1.40		-	
<b>&gt;&gt;User Plane Information</b>	M				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		-	
>>Transport Layer Address	M		9.2.2.1		-	
>>lu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
>> Alternative RAB Parameter Values	O		9.2.1.43		YES	ignore
Integrity Protection Information	O		9.2.1.11	Integrity Protection Information includes key and permitted algorithms.	YES	ignore
Encryption Information	O		9.2.1.12	Encryption Information includes key and permitted algorithms.	YES	ignore
lu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global CN-ID	O		9.2.1.46		YES	reject
<a href="#">UESBI-lu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

Condition	Explanation
IfPS	This IE shall be present if the <i>CN domain indicator</i> IE is set to "PS domain".

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

## 9.1.24 COMMON ID

This message is sent by the CN to inform RNC about the permanent NAS UE identity for a user.

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		YES	ignore
Permanent NAS UE Identity	M		9.2.3.1		YES	ignore
<a href="#">UESBI-Iu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

## 9.1.45 RESET RESOURCE ACKNOWLEDGE

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

Direction: CN  $\leftrightarrow$  RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
CN Domain Indicator	M		9.2.1.5		YES	reject
<b>Reset Resource List</b>	M				YES	ignore
<b>&gt;Reset Resource Item IEs</b>		1 to <maxnoofluSigConIds>		This list shall be in the same order as the list received in the RESET RESOURCE message.	EACH	reject
>>lu Signalling Connection Identifier	M		9.2.1.38		-	
Global RNC-ID	O		9.2.1.39		YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore
Global CN-ID	O		9.2.1.46		YES	ignore

Range bound	Explanation
maxnoofluSigConIds	Maximum no. of lu signalling connection identifiers. Value is 250.

### 9.1.45a UE SPECIFIC INFORMATION INDICATION

[This message is sent by the CN to inform the RNC about information related to this connection.](#)

[Direction: CN  \$\rightarrow\$  RNC.](#)

[Signalling bearer mode: Connection oriented.](#)

<a href="#">IE/Group Name</a>	<a href="#">Presence</a>	<a href="#">Range</a>	<a href="#">IE type and reference</a>	<a href="#">Semantics description</a>	<a href="#">Criticality</a>	<a href="#">Assigned Criticality</a>
<a href="#">Message Type</a>	<a href="#">M</a>		<a href="#">9.2.1.1</a>		<a href="#">YES</a>	<a href="#">ignore</a>
<a href="#">UESBI-lu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

## 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  $\rightarrow$  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
<b>RABs To Be Modified List</b>	M				YES	Ignore
<b>&gt;RABs To Be Modified Item IEs</b>		1 to <maxnoofRABs>			EACH	Ignore
>>RAB ID	M		9.2.1.2	Uniquely identifies the RAB for a specific CN domain, for a particular UE.	-	
>> Requested RAB Parameter Values	M		9.2.1.45	Includes RAB parameters for which different values than what was originally negotiated are being requested.	-	

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

#### 9.2.1.4 Cause

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b> >Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing 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	Value range is 1 – 64.



IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			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), lu UP Failure(28), TRELOAlloc Expiry (7), Relocation Failure	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46),</p> <p>RNC unable to establish all RFCs (47),</p> <p>Deciphering Keys Not Available(48),</p> <p>Dedicated Assistance data Not Available(49),</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Relocation Target not allowed(50), Location Reporting Congestion(51), <a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature(56)</a>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66))	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83))	Value range is 81 – 96.
>Protocol Cause			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))	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) )	Value range is 113 – 128.
>Non-standard Cause			INTEGER ( )	Value range is 129 – 256. Cause value 256 shall not be used.

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

<b>Radio Network Layer cause</b>	<b>Meaning</b>
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Dedicated Assistance data Not Available	The action failed because RNC is not able to successfully deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
<a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature.</a>	<a href="#">The incoming relocation cannot be accepted by the target RNC because of the PUESBINE feature.</a>
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Target not allowed	Relocation to the indicated target cell is not allowed for the UE in question.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not	The action failed because requested maximum bit rate is not

Available	available.
Requested Request Type Not Supported	The RNC is not supporting the requested location request type either because it doesn't support the requested event or it doesn't support the requested report area.
Location Reporting Congestion	The action was not performed due to an inability to support location reporting caused by overload.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.
Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.
Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity.
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.
RNC unable to establish all RFCs	RNC couldn't establish all RAB subflow combinations indicated within the <i>RAB Parameters</i> IE.

Transport Layer cause	Meaning
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed (e.g. processor reset).

NAS cause	Meaning
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

Protocol cause	Meaning
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Transfer Syntax Error	The received message included a transfer syntax error.

<b>Miscellaneous cause</b>	<b>Meaning</b>
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.



### 9.2.1.42 Message Structure

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

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

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

#### [9.2.1.42a UESBI-Iu](#)

[The purpose of the UESBI-Iu IE is to transfer the UE Specific Behaviour Information as defined in \[27\] and \[28\] from the CN to the RNC.](#)

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
<u>UESBI-Iu</u>				
<u>&gt;UESBI-IuA</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuA</i> provides compliance status information about the UE with regards to specific behaviours described in [27].</p> <p>[27] defines the mapping between the descriptions in [27] and the <i>UESBI-IuA</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [27].</p>
<u>&gt;UESBI-IuB</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuB</i> provides compliance status information about the UE with regards to specific behaviours described in [28].</p> <p>[28] defines the mapping between the descriptions in [28] and the <i>UESBI-IuB</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [28].</p>

### 9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to 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.

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<b>Alternative RAB parameter values</b>				
			Discrete values)	from the CN i.e. the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.
<b>&gt;&gt;Alternative Guaranteed Bit Rates</b>	C ifValueRangeorDiscreteValuesGBR	1 to <nbr-AlternativeValues>		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.
<b>&gt;&gt;&gt;Bit Rate</b>	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

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

## 9.3.2 Elementary Procedure Definitions

```

-- *****
--
-- 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,
    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,
    LocationRelatedDataRequest,
    LocationRelatedDataResponse,
    LocationRelatedDataFailure,
UESpecificInformationIndication
FROM RANAP-PDU-Contents

    id-LocationRelatedData,
    id-CN-DeactivateTrace,
    id-CN-InvokeTrace,
    id-CommonID,
    id-DataVolumeReport,
    id-DirectTransfer,

```

```

id-ErrorIndication,
id-ForwardSRNS-Context,
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-RelocationCancel,
id-RelocationComplete,
id-RelocationDetect,
id-RelocationPreparation,
id-RelocationResourceAllocation,
id-Reset,
id-SRNS-ContextTransfer,
id-SRNS-DataForward,
id-SecurityModeControl,
id-ResetResource,
id-UESpecificInformation

```

FROM RANAP-Constants;

Lots of unaffected ASN1 in 9.3.2 not shown

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-2 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-ReleaseRequest      |
  iu-ReleaseRequest      |
  relocationDetect        |
  relocationComplete      |
  paging                  |
  commonID                |
  cN-InvokeTrace         |
  cN-DeactivateTrace     |
  locationReportingControl |
  locationReport         |
  initialUE-Message      |
  directTransfer         |
  overloadControl        |
  errorIndication        |
  sRNS-DataForward       |
  forwardSRNS-Context    |
  privateMessage         |
  rANAP-Relocation       |
  ... ,
  rAB-ModifyRequest      |
  uESpecificInformation |
}

```

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-3 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-Assignment      ,
  ...
}

```

```

-- *****
--
-- Interface Elementary Procedures
--
-- *****

```

```

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
}

uESpecificInformation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  uESpecificInformationIndication
  PROCEDURE CODE      id-uESpecificInformation
  CRITICALITY         ignore
}

END
```



### 9.3.3 PDU Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
BroadcastAssistanceDataDecipheringKeys,
LocationRelatedDataRequestType,
DataVolumeReference,
AreaIdentity,
CN-DomainIndicator,
Cause,
ClientType,
CriticalityDiagnostics,
ChosenEncryptionAlgorithm,
ChosenIntegrityProtectionAlgorithm,
ClassmarkInformation2,
ClassmarkInformation3,
DL-GTP-PDU-SequenceNumber,
DL-N-PDU-SequenceNumber,
DataVolumeReportingIndication,
DRX-CycleLengthCoefficient,
EncryptionInformation,
GlobalCN-ID,
GlobalRNC-ID,
IntegrityProtectionInformation,
IuSignallingConnectionIdentifier,
IuTransportAssociation,
KeyStatus,
L3-Information,
LAI,
LastKnownServiceArea,
NAS-PDU,
NAS-SynchronisationIndicator,
NonSearchingIndication,
NumberOfSteps,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
PositioningPriority,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
Requested-RAB-Parameter-Values,
ResponseTime,
SAI,
SAPI,
Service-Handover,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,

```

```

UE-ID,
UESBI-Iu,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
VerticalAccuracyCode,
Alt-RAB-Parameters,
Ass-RAB-Parameters
FROM RANAP-IES

```

```

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

```

```

maxNrOfDTs,
maxNrOfErrors,
maxNrOfIuSigConIds,
maxNrOfRABs,
maxNrOfVol,

```

```

id-AreaIdentity,
id-Alt-RAB-Parameters,
id-Ass-RAB-Parameters,
id-BroadcastAssistanceDataDecipheringKeys,
id-LocationRelatedDataRequestType,
id-CN-DomainIndicator,
id-Cause,
id-ChosenEncryptionAlgorithm,
id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-ClientType,
id-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalCN-ID,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-PositioningPriority,
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-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-ResponseTime,
id-SAI,
id-SAPI,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UESBI-Iu,
id-UL-GTP-PDU-SequenceNumber,
id-VerticalAccuracyCode
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- *****
--
-- Relocation Request
--
-- *****

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

RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE optional } |
    { ID id-Cause                        CRITICALITY ignore  TYPE Cause                PRESENCE
    mandatory } |
    { ID id-CN-DomainIndicator           CRITICALITY reject  TYPE CN-DomainIndicator
    PRESENCE mandatory } |
    { ID id-SourceRNC-ToTargetRNC-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},
  ...
}

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 99 to enable specific behaviour by the RNC in relation with early UE
  handling --
  { ID id-UESBI-Iu  CRITICALITY ignore  EXTENSION UESBI-Iu  PRESENCE optional },
  ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- COMMON ID ELEMENTARY PROCEDURE
--
-- *****
--
-- Common ID
--
-- *****

```

```

CommonID ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {CommonID-IEs} },
  protocolExtensions  ProtocolExtensionContainer { {CommonIDExtensions} }
  OPTIONAL,
  ...
}

```

```

CommonID-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE mandatory },
  ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
  -- Extension for Release 99 to enable specific behaviour by the RNC in relation with early UE
  -- handling --
  { ID id-UESBI-Iu          CRITICALITY ignore          EXTENSION UESBI-Iu  PRESENCE optional},
  ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- 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 ::= {
  ...
}

-- *****
--
-- UE SPECIFIC INFORMATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- UE Specific Information Indication
--
-- *****

UESpecificInformationIndication ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { UESpecificInformationIndicationIEs } },
  protocolExtensions   ProtocolExtensionContainer { { UESpecificInformationIndicationExtensions } }
  OPTIONAL,
  ...
}

UESpecificInformationIndicationIEs RANAP-PROTOCOL-IES ::= {
  { ID id-UESBI-Iu          CRITICALITY ignore  TYPE UESBI-Iu          PRESENCE
  optional },
  ...
}

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

END

```

## 9.3.4 Information Element Definitions

```

-- *****
--
-- Information Element Definitions
--
-- *****

RANAP-IEs {
itu-t (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
    maxNrOfErrors,
    maxNrOfPDPDirections,
    maxNrOfPoints,
    maxNrOfRABs,
    maxNrOfSRBs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination,
    maxNrOfLevels,
    maxNrOfAltValues,

    id-CN-DomainIndicator,
    id-MessageStructure,
    id-SRB-TrCH-Mapping,
    id-TypeOfError

FROM RANAP-Constants

    Criticality,
    ProcedureCode,
    ProtocolIE-ID,
    TriggeringMessage
FROM RANAP-CommonDataTypes

    ProtocolExtensionContainer{ },
    RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;

```

Lots of unaffected ASN1 in 9.3.4 not shown
--

```

CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    trellocalloc-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),
incoming-relocation-not-supported-due-to-PUESBINE-feature (56)
} (1..64)

```

Lots of unaffected ASN1 in 9.3.4 not shown

```

-- U

UE-ID ::= CHOICE {
    imsi             IMSI,
    imei             IMEI,
    ...
}

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)

UP-ModeVersions                 ::= BIT STRING (SIZE (16))

USCH-ID                         ::= INTEGER (0..255)

UserPlaneMode ::= ENUMERATED {
    transparent-mode,
    support-mode-for-predefined-SDU-sizes,
    ...
}

-- V

VerticalAccuracyCode            ::= INTEGER (0..127)

END

```

## 9.3.6 Constant Definitions

```

-- *****
--
-- Constant definitions
--
-- *****

RANAP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- Elementary Procedures
--
-- *****

id-RAB-Assignment                INTEGER ::= 0
id-Iu-Release                    INTEGER ::= 1
id-RelocationPreparation         INTEGER ::= 2
id-RelocationResourceAllocation  INTEGER ::= 3
id-RelocationCancel             INTEGER ::= 4
id-SRNS-ContextTransfer         INTEGER ::= 5
id-SecurityModeControl          INTEGER ::= 6
id-DataVolumeReport             INTEGER ::= 7
id-Reset                        INTEGER ::= 9
id-RAB-ReleaseRequest           INTEGER ::= 10
id-Iu-ReleaseRequest            INTEGER ::= 11
id-RelocationDetect             INTEGER ::= 12
id-RelocationComplete           INTEGER ::= 13
id-Paging                       INTEGER ::= 14
id-CommonID                    INTEGER ::= 15
id-CN-InvokeTrace              INTEGER ::= 16
id-LocationReportingControl     INTEGER ::= 17
id-LocationReport              INTEGER ::= 18
id-InitialUE-Message           INTEGER ::= 19
id-DirectTransfer              INTEGER ::= 20
id-OverloadControl             INTEGER ::= 21
id-ErrorIndication             INTEGER ::= 22
id-SRNS-DataForward            INTEGER ::= 23
id-ForwardSRNS-Context         INTEGER ::= 24
id-privateMessage              INTEGER ::= 25
id-CN-DeactivateTrace         INTEGER ::= 26
id-ResetResource               INTEGER ::= 27
id-RANAP-Relocation            INTEGER ::= 28
id-RAB-ModifyRequest           INTEGER ::= 29
id-LocationRelatedData         INTEGER ::= 30
id-UESpecificInformation        INTEGER ::= 32

-- *****
--
-- Extension constants
--
-- *****

maxPrivateIEs                   INTEGER ::= 65535
maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs                 INTEGER ::= 65535

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

maxNrOfDTs                     INTEGER ::= 15
maxNrOfErrors                   INTEGER ::= 256
maxNrOfIuSigConIds             INTEGER ::= 250
maxNrOfPDPDirections           INTEGER ::= 2
maxNrOfPoints                  INTEGER ::= 15
maxNrOfRABs                    INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfSRBs                    INTEGER ::= 8
maxNrOfVol                     INTEGER ::= 2
maxNrOfLevels                   INTEGER ::= 256

```



```

maxNrOfAltValues                INTEGER ::= 16

maxRAB-Subflows                  INTEGER ::= 7
maxRAB-SubflowCombination        INTEGER ::= 64

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

id-AreaIdentity                  INTEGER ::= 0
id-CN-DomainIndicator            INTEGER ::= 3
id-Cause                         INTEGER ::= 4
id-ChosenEncryptionAlgorithm      INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2          INTEGER ::= 7
id-ClassmarkInformation3          INTEGER ::= 8
id-CriticalityDiagnostics         INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber      INTEGER ::= 10
id-EncryptionInformation          INTEGER ::= 11
id-IntegrityProtectionInformation  INTEGER ::= 12
id-IuTransportAssociation         INTEGER ::= 13
id-L3-Information                 INTEGER ::= 14
id-LAI                           INTEGER ::= 15
id-NAS-PDU                       INTEGER ::= 16
id-NonSearchingIndication         INTEGER ::= 17
id-NumberOfSteps                  INTEGER ::= 18
id-OMC-ID                        INTEGER ::= 19
id-OldBSS-ToNewBSS-Information    INTEGER ::= 20
id-PagingAreaID                  INTEGER ::= 21
id-PagingCause                    INTEGER ::= 22
id-PermanentNAS-UE-ID            INTEGER ::= 23
id-RAB-ContextItem               INTEGER ::= 24
id-RAB-ContextList                INTEGER ::= 25
id-RAB-DataForwardingItem         INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList         INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem       INTEGER ::= 30
id-RAB-DataVolumeReportList       INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem                INTEGER ::= 34
id-RAB-FailedList                 INTEGER ::= 35
id-RAB-ID                         INTEGER ::= 36
id-RAB-QueuedItem                 INTEGER ::= 37
id-RAB-QueuedList                 INTEGER ::= 38
id-RAB-ReleaseFailedList          INTEGER ::= 39
id-RAB-ReleaseItem                INTEGER ::= 40
id-RAB-ReleaseList                INTEGER ::= 41
id-RAB-ReleasedItem               INTEGER ::= 42
id-RAB-ReleasedList               INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp      INTEGER ::= 44
id-RAB-RelocationReleaseItem       INTEGER ::= 45
id-RAB-RelocationReleaseList       INTEGER ::= 46
id-RAB-SetupItem-RelocReq          INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck       INTEGER ::= 48
id-RAB-SetupList-RelocReq          INTEGER ::= 49
id-RAB-SetupList-RelocReqAck       INTEGER ::= 50
id-RAB-SetupOrModifiedItem         INTEGER ::= 51
id-RAB-SetupOrModifiedList         INTEGER ::= 52
id-RAB-SetupOrModifyItem           INTEGER ::= 53
id-RAB-SetupOrModifyList           INTEGER ::= 54
id-RAC                            INTEGER ::= 55
id-RelocationType                 INTEGER ::= 56
id-RequestType                    INTEGER ::= 57
id-SAI                            INTEGER ::= 58
id-SAPI                           INTEGER ::= 59
id-SourceID                       INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer INTEGER ::= 61
id-TargetID                       INTEGER ::= 62
id-TargetRNC-ToSourceRNC-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-VerticalAccuracyCode	INTEGER ::= 111
id-ResponseTime	INTEGER ::= 112
id-PositioningPriority	INTEGER ::= 113
id-ClientType	INTEGER ::= 114
<u>id-UESBI-Iu</u>	<u>INTEGER ::= 118</u>

END

3GPP TSG-RAN3 Meeting #36  
Paris, France, 19<sup>th</sup>-23<sup>rd</sup> May 2003

Tdoc #R3-030855

CR-Form-v7

## CHANGE REQUEST

⌘ **25.413** CR **573** ⌘ rev **2** ⌘ Current version: **5.4.0** ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Introduction of Early UE Handling – Bitmap Option		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ RANimp-FSEarlyUE	<b>Date:</b>	⌘ 22/05/2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ It has been agreed at RAN Adhoc on Early UE Handling feature to transfer the UESBI information over the lu interface. There is currently no cause value in RANAP to indicate that the RNC cannot support incoming relocation from 2G for a given UE due to early UE handling.
<b>Summary of change:</b>	⌘ The UESBI (UE Specific Behaviour Information) is transferred over the lu interface as a bit string. A new class 2 procedure is introduced to transfer it when it is not possible via Common-Id message. A new cause value is introduced to deal with the case of early UE handling in 2g-3g handover.  <u>Impact assessment towards the previous version of the specification (same release):</u>  This CR has isolated impact towards the previous version of the specification (same release).  This CR has an impact under protocol and functional point of view.  The impact can be considered isolated because it only affects the common-id and the relocation resource allocation system functions.
<b>Consequences if not approved:</b>	⌘ Mechanisms for handling of Early UEs cannot be supported.

**Clauses affected:** ⌘ 2, 3, 8.1, 8.7, 8.16, 8.29a (new), 9.1.10, 9.1.24, 9.1.45a (new), 9.2.1.4, 9.2.1.42a (new), 9.3.2, 9.3.3, 9.3.4, 9.3.6.

Y  N

<b>Other specs</b>	⌘	X	Other core specifications	⌘	TS25.413 R99 CR565r2 TS25.413 REL-4 CR566r2
<b>affected:</b>		X	Test specifications		
		X	O&M Specifications		
<b>Other comments:</b>	⌘				

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

---

## 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".

- [1] 3GPP TR 23.930: "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 48.008: "3<sup>rd</sup> Generation Partnership Project (3GPP) Technical Specification Group GSM EDGE Radio Access Network; Mobile-services Switching Centre – Base Station System (MSC - BSS) interface; Layer 3 specification".
- [12] 3GPP TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".

- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".
- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [25] 3GPP TS 12.20: "Base Station System (BSS) management information".
- [26] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".
- [27] 3GPP TS 43.051: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Overall description - Stage 2".
- [28] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services (LCS) in UTRAN".
- [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: "Measures employed by the UMTS Radio Access Network \(UTRAN\) to overcome early User Equipment \(UE\) implementation faults"](#)
- [32] [3GPP TR 25.995: "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: "Provision of UE Specific Behaviour Information to Network Entities"](#)

---

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

**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.

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

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

**Default CN node:** An RNC with an inactive or not implemented NAS Node Selection Function [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.

**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 [27]).

**PUESBINE feature:** [as defined in \[33\]](#).

**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.

**Serving RNS (SRNS):** 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

**Serving RNC (SRNC):** SRNC is the RNC belonging to SRNS

**SRNC-ID:** see [3] for definition

**S-RNTI:** see [3] for definition

**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

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

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

**UE Specific Behaviour Information – Iu (UESBI-Iu):** as defined in [33].

**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 [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.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAL2	ATM Adaptation Layer type 2
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
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel
EP	Elementary Procedure
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
MM	Mobility Management
MSC	Mobile services Switching Center
NAS	Non Access Stratum
NNSF	NAS Node Selection Function
N-PDU	Network – Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PS	Packet Switched
<a href="#">PUESBINE</a>	<a href="#">Provision of UE Specific Behaviour Information to Network Entities</a>
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
SAI	Service Area Identifier
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SNA	Shared Network Area
SNAC	Shared Network Area Code
SRNC	Serving RNC
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
<a href="#">UESBI-Iu</a>	<a href="#">UE Specific Behaviour Information - Iu</a>
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

## 8.1 Elementary Procedures

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

**Table 1: Class 1**

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Iu Release	IU RELEASE COMMAND	IU RELEASE COMPLETE	
Relocation Preparation	RELOCATION REQUIRED	RELOCATION COMMAND	RELOCATION PREPARATION FAILURE
Relocation Resource Allocation	RELOCATION REQUEST	RELOCATION REQUEST ACKNOWLEDGE	RELOCATION FAILURE
Relocation Cancel	RELOCATION CANCEL	RELOCATION CANCEL ACKNOWLEDGE	
SRNS Context Transfer	SRNS CONTEXT REQUEST	SRNS CONTEXT RESPONSE	
Security Mode Control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	SECURITY MODE REJECT
Data Volume Report	DATA VOLUME REPORT REQUEST	DATA VOLUME REPORT	
Reset	RESET	RESET ACKNOWLEDGE	
Reset Resource	RESET RESOURCE	RESET RESOURCE ACKNOWLEDGE	
Location related Data	LOCATION RELATED DATA REQUEST	LOCATION RELATED DATA RESPONSE	LOCATION RELATED DATA FAILURE
Information Transfer	INFORMATION TRANSFER INDICATION	INFORMATION TRANSFER CONFIRMATION	INFORMATION TRANSFER FAILURE

**Table 2: Class 2**

<b>Elementary Procedure</b>	<b>Message</b>
RAB Modification Request	RAB MODIFY REQUEST
RAB Release Request	RAB RELEASE REQUEST
Iu Release Request	IU RELEASE REQUEST
Relocation Detect	RELOCATION DETECT
Relocation Complete	RELOCATION COMPLETE
SRNS Data Forwarding Initiation	SRNS DATA FORWARD COMMAND
SRNS Context Forwarding from Source RNC to CN	FORWARD SRNS CONTEXT
SRNS Context Forwarding to Target RNC from CN	FORWARD SRNS CONTEXT
Paging	PAGING
Common ID	COMMON ID
CN Invoke Trace	CN INVOKE TRACE
CN Deactivate Trace	CN DEACTIVATE TRACE
Location Reporting Control	LOCATION REPORTING CONTROL
Location Report	LOCATION REPORT
Initial UE Message	INITIAL UE MESSAGE
Direct Transfer	DIRECT TRANSFER
Overload Control	OVERLOAD
Error Indication	ERROR INDICATION
<a href="#">UE Specific Information</a>	<a href="#">UE SPECIFIC INFORMATION INDICATION</a>

**Table 3: Class 3**

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

The following applies concerning interference between Elementary Procedures:

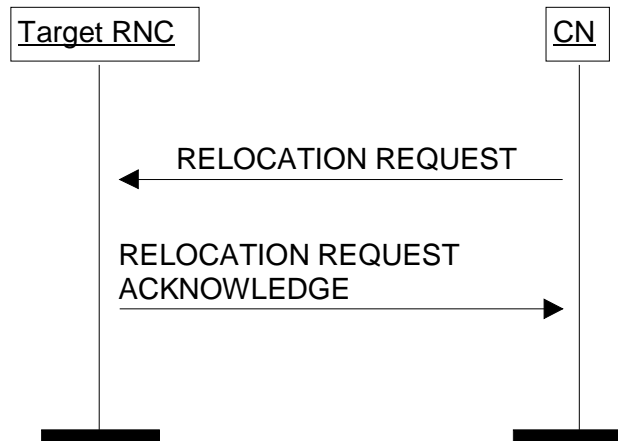
- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

## 8.7 Relocation Resource Allocation

### 8.7.1 General

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

### 8.7.2 Successful Operation



**Figure 7: Relocation Resource Allocation procedure. Successful operation.**

The CN shall initiate the procedure by generating RELOCATION REQUEST message. In a UTRAN to UTRAN relocation, this message shall contain the information (if any) required by the UTRAN to build the same set of RABs as existing for the UE before the relocation. 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 CN shall transmit the RELOCATION REQUEST message to target RNC and the CN shall start the timer  $T_{RELOCalloc}$ .

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

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

The RELOCATION REQUEST message shall contain following IEs

- *Permanent NAS UE Identity* IE (if available)
- *Cause*
- *CN Domain Indicator*
- *Source RNC To Target RNC Transparent Container*
- *Iu Signalling Connection Identifier*
- *Integrity Protection Information* IE (if available)
- [SNA Access Information](#) IE (if available)
- [UESBI-Iu](#) (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 following IEs:

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

The RELOCATION REQUEST message may include following IEs:

- *Encryption Information* (shall not be included if the *Integrity Protection Information* IE is not included)

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

- *Service Handover*.
- *Alternative RAB Parameter Values*.

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*
- *User plane Information*(i.e. required User Plane Mode and required User Plane Versions)
- *Priority level, queuing and pre-emption indication*
- *Service Handover*

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 *PDP Type Information* IE, the UTRAN may use this IE to configure any compression algorithms.

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 CN node involved. The RNC shall store and remember this identifier for the duration of the Iu connection.

[The RNC shall, if supported, use the UESBI-Iu IE when included in the RELOCATION REQUEST message.](#)

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

The *Permitted Encryption Algorithms* IE within the *Encryption Information* IE may contain "no encryption" within an element of its list in order to allow the RNC not to cipher the respective connection. This can be done either by not

starting ciphering or by using the UEA0 algorithm. In the absence of the *Encryption Information IE*, the RNC shall not start ciphering.

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 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* from the RELOCATION REQUEST messages over the Iu interface.

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.

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

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

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

- 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 does 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 target RNC, the radio bearers shall be ignored during the relocation of SRNS and the radio bearers shall be released by 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".

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

For each RAB successfully setup the RNC shall include 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 Relocation Resource Allocation 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 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.

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.

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.

Transmission and reception of RELOCATION REQUEST ACKNOWLEDGE message terminates the procedure in the UTRAN and 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 [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

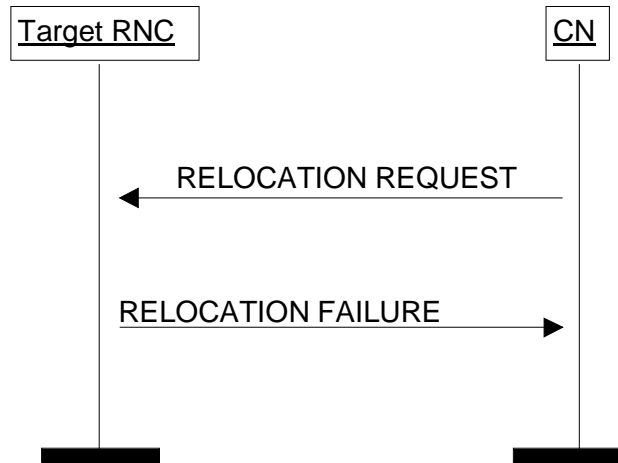
### 8.7.2.1 Successful Operation for GERAN Iu-mode

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 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 [27]).

### 8.7.3 Unsuccessful Operation



**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 RELOCATION FAILURE message to the CN.

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".

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

When CN has received RELOCATION FAILURE message from target RNC, CN shall stop timer  $T_{RELOCalloc}$  and shall assume possibly allocated resources within target RNC completely released.

In the 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 may contain the appropriate value in the *Cause* IE, e.g. "No Radio Resources Available in Target Cell".

#### 8.7.3.1 Unsuccessful Operation for GERAN Iu-mode

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

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



## 8.7.4 Abnormal Conditions

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

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

### Interactions with Iu Release procedure:

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

NOTE: In case two CN domains are involved in the SRNS 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 the 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 the 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 by each CN domain within RELOCATION REQUEST message, to co-ordinate both Iu signalling connections.
- The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE message 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.

## 8.16 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 uses connection oriented signalling.

### 8.16.2 Successful Operation



**Figure 17: Common ID procedure. Successful operation.**

After having established an Iu signalling connection, and if the Permanent NAS UE identity (i.e. IMSI) is available, the CN shall send a COMMON ID message, containing the *Permanent NAS UE Identity* IE and optionally the *SNA Access Information* IE to the RNC. [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 *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.

### 8.16.3 Abnormal Conditions

Not applicable.

## 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

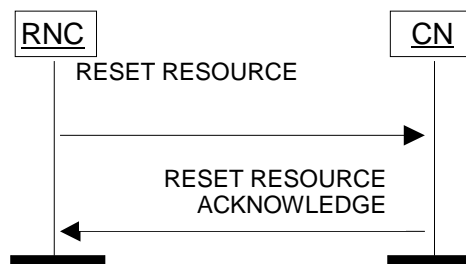
Void

#### 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



**Figure 34: RNC initiated Reset Resource procedure. Successful operation.**

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

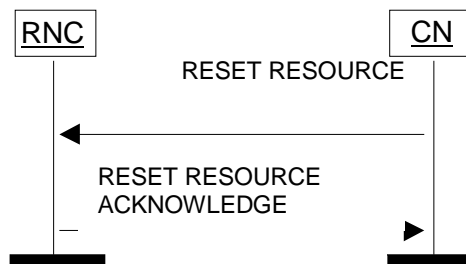
The RESET RESOURCE message shall include the *CN Domain Indicator* IE, the *Global RNC-ID* IE, the *Cause* IE with appropriate cause value (e.g. "Signalling Transport Resource Failure") and a list containing *Iu Signalling Connection Identifier* IEs.

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.

Both CN and 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



**Figure 35: CN initiated Reset Resource procedure. Successful operation.**

The CN initiates this 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 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 RNC and 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.

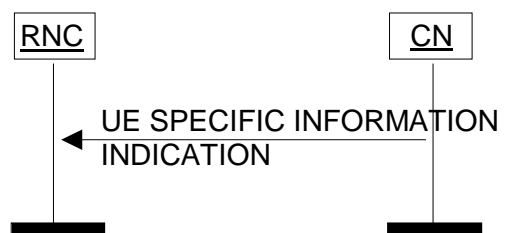
## 8.29a UE Specific Information

### 8.29a.1 General

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

The procedure uses connection oriented signalling.

### 8.29a.2 Successful Operation



**Figure 17: UE Specific Information procedure. Successful operation.**

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

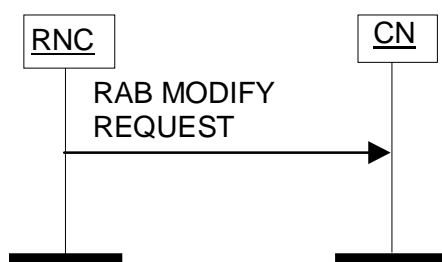
The RNC shall, if supported, use the *UESBI-Iu* IE when received in the UE SPECIFIC INFORMATION INDICATION message.

## 8.30 RAB Modification Request

### 8.30.1 General

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

### 8.30.2 Successful Operation



**Figure 36: RAB Modification procedure.**

The RNC shall initiate the procedure by generating a RAB MODIFY REQUEST message towards the CN and shall include a list of *RABs To Be Modified* IEs. For each RAB requested to be modified the *RABs To Be Modified Item* IE of the RAB MODIFY REQUEST message shall include the *RAB ID* IE, and the corresponding *Requested RAB Parameter Values* IE. The *Requested RAB Parameter Values* IE shall list those RAB parameters the RNC would like modified and the associated new RAB parameter values it is requesting. For any given RAB, RNC shall be able to propose modifications to any negotiable RAB parameters.

Upon reception of the RAB MODIFY REQUEST message, it is up to the CN to decide how to react to the request.

### 8.30.3 Abnormal Conditions

Not applicable.

## 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.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Permanent NAS UE Identity	O		9.2.3.1		YES	ignore
Cause	M		9.2.1.4		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	reject
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
<b>RABs To Be Setup List</b>	O				YES	reject
<b>&gt;RABs To Be Setup Item IEs</b>		1 to <maxnoofRABs>			EACH	reject
>>RAB ID	M		9.2.1.2		-	
>>NAS Synchronisation Indicator	O		9.2.3.18		-	
>>RAB Parameters	M		9.2.1.3		-	
>>Data Volume Reporting Indication	C – ifPS		9.2.1.17		-	
>> PDP Type Information	C – ifPS		9.2.1.40		-	
<b>&gt;&gt;User Plane Information</b>	M				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		-	
>>Transport Layer Address	M		9.2.2.1		-	
>>Iu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
>> Alternative RAB Parameter Values	O		9.2.1.43		YES	Ignore
>>GERAN BSC Container	O		9.2.1.58		-	
Integrity Protection Information	O		9.2.1.11	Integrity Protection Information includes key and permitted algorithms.	YES	ignore
Encryption Information	O		9.2.1.12	Encryption Information includes key and permitted algorithms.	YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global CN-ID	O		9.2.1.46		YES	reject
SNA Access Information	O		9.2.3.24		YES	ignore
<a href="#">UESBI-Iu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

Condition	Explanation
IfPS	This IE shall be present if the <i>CN domain indicator</i> IE is set to "PS domain".

<b>Range bound</b>	<b>Explanation</b>
maxnoofRABs	Maximum no. of RABs for one UE. Value is 256.



## 9.1.24 COMMON ID

This message is sent by the CN to inform RNC about the permanent NAS UE identity for a user.

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		YES	ignore
Permanent NAS UE Identity	M		9.2.3.1		YES	ignore
SNA Access Information	O		9.2.3.24		YES	ignore
<a href="#">UESBI-Iu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

## 9.1.45 RESET RESOURCE ACKNOWLEDGE

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

Direction: CN  $\leftrightarrow$  RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
CN Domain Indicator	M		9.2.1.5		YES	reject
<b>Reset Resource List</b>	M				YES	ignore
<b>&gt;Reset Resource Item IEs</b>		1 to <maxnoofluSigConIds>		This list shall be in the same order as the list received in the RESET RESOURCE message.	EACH	reject
>>lu Signalling Connection Identifier	M		9.2.1.38		-	
Global RNC-ID	O		9.2.1.39		YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore
Global CN-ID	O		9.2.1.46		YES	ignore

Range bound	Explanation
maxnoofluSigConIds	Maximum no. of lu signalling connection identifiers. Value is 250.

### 9.1.45a UE SPECIFIC INFORMATION INDICATION

[This message is sent by the CN to inform the RNC about information related to this connection.](#)

[Direction: CN  \$\rightarrow\$  RNC.](#)

[Signalling bearer mode: Connection oriented.](#)

<a href="#">IE/Group Name</a>	<a href="#">Presence</a>	<a href="#">Range</a>	<a href="#">IE type and reference</a>	<a href="#">Semantics description</a>	<a href="#">Criticality</a>	<a href="#">Assigned Criticality</a>
<a href="#">Message Type</a>	<a href="#">M</a>		<a href="#">9.2.1.1</a>		<a href="#">YES</a>	<a href="#">ignore</a>
<a href="#">UESBI-lu</a>	<a href="#">O</a>		<a href="#">9.2.1.42a</a>		<a href="#">YES</a>	<a href="#">ignore</a>

## 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  $\rightarrow$  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
<b>RABs To Be Modified List</b>	M				YES	Ignore
<b>&gt;RABs To Be Modified Item IEs</b>		1 to <maxnoofRABs>			EACH	Ignore
>>RAB ID	M		9.2.1.2	Uniquely identifies the RAB for a specific CN domain, for a particular UE.	-	
>> Requested RAB Parameter Values	M		9.2.1.45	Includes RAB parameters for which different values than what was originally negotiated are being requested.	-	

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

#### 9.2.1.4 Cause

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing 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	Value range is 1 – 64.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			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), lu UP Failure(28), TRELOAlloc Expiry (7), Relocation Failure	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46),</p> <p>RNC unable to establish all RFCs (47),</p> <p>Deciphering Keys Not Available(48),</p> <p>Dedicated Assistance data Not Available(49),</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			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), <a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature(56)</a>	



IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66))	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83))	Value range is 81 – 96.
>Protocol Cause			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))	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) )	Value range is 113 – 128.
>Non-standard Cause			INTEGER ( )	Value range is 129 – 256. Cause value 256 shall not be used.

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

<b>Radio Network Layer cause</b>	<b>Meaning</b>
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Dedicated Assistance data Not Available	The action failed because RNC is not able to successfully deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
<a href="#">Incoming Relocation Not Supported Due To PUESBINE Feature</a>	<a href="#">The incoming relocation cannot be accepted by the target RNC because of the PUESBINE feature.</a>
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Target not allowed	Relocation to the indicated target cell is not allowed for the UE in question.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not	The action failed because requested maximum bit rate is not

Available	available.
Requested Request Type Not Supported	The RNC is not supporting the requested location request type either because it doesn't support the requested event or it doesn't support the requested report area.
Location Reporting Congestion	The action was not performed due to an inability to support location reporting caused by overload.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.
Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.
Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity.
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.
RNC unable to establish all RFCs	RNC couldn't establish all RAB subflow combinations indicated within the <i>RAB Parameters</i> IE.
Reduce Load in Serving Cell	Load on serving cell needs to be reduced.
No Radio Resources Available in Target Cell	Load on target cell is too high.
GERAN Iu-mode failure	The RAB establishment/modification/relocation failed because the GERAN BSC cannot provide an appropriate RAB due to limited capabilities within GERAN.
Access Restricted Due to Shared Networks	Access is not permitted in the cell due to Shared Networks.

<b>Transport Layer cause</b>	<b>Meaning</b>
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed ( <i>e.g. processor reset</i> ).

<b>NAS cause</b>	<b>Meaning</b>
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

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

<b>Miscellaneous cause</b>	<b>Meaning</b>
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.

### 9.2.1.42 Message Structure

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

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

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

#### [9.2.1.42a UESBI-Iu](#)

[The purpose of the UESBI-Iu IE is to transfer the UE Specific Behaviour Information as defined in \[31\] and \[32\] from the CN to the RNC.](#)

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
<u>UESBI-Iu</u>				
<u>&gt;UESBI-IuA</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuA</i> provides compliance status information about the UE with regards to specific behaviours described in [31].</p> <p>[31] defines the mapping between the descriptions in [31] and the <i>UESBI-IuA</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [31].</p>
<u>&gt;UESBI-IuB</u>	<u>O</u>		<u>BIT STRING (1..128)</u>	<p>The <i>UESBI-IuB</i> provides compliance status information about the UE with regards to specific behaviours described in [32].</p> <p>[32] defines the mapping between the descriptions in [32] and the <i>UESBI-IuB</i>.</p> <p>Each bit on a certain position is associated with a certain behaviour described in [32].</p>

### 9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to 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.

<b>IE/Group Name</b>	<b>Presence</b>	<b>Range</b>	<b>IE type and reference</b>	<b>Semantics description</b>
<b>Alternative RAB parameter values</b>				
<b>&gt;Alternative Maximum Bit Rate Information</b>	<u>O</u>			Included only if negotiation is allowed for this IE.
<b>&gt;&gt;Type of Alternative Maximum Bit Rate Information</b>	<u>M</u>		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.
<b>&gt;&gt;&gt;Alternative Maximum Bit Rates</b>	<u>C</u> - ifValueRangeorDiscreteValuesM BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values, 1 to 16 discrete values can be given.
<b>&gt;&gt;&gt;&gt;Bit Rate</b>	<u>M</u>	1 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
<b>&gt;Alternative Guaranteed Bit Rate Information</b>	<u>O</u>			Included only if negotiation is allowed for this IE.
<b>&gt;&gt;Type of Alternative Guaranteed Bit Rate Information</b>	<u>M</u>		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. the RNC is allowed to assign any value equal

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<b>Alternative RAB parameter values</b>				
				or below the ones indicated in the <i>RAB Parameters</i> IE.
<b>&gt;&gt;Alternative Guaranteed Bit Rates</b>	C ifValueRangeorDiscreteValuesGBR	1 to <nbr-AlternativeValues>		For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values, 1 to 16 discrete values can be given.
<b>&gt;&gt;&gt;Bit Rate</b>	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

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



## 9.3.2 Elementary Procedure Definitions

```

-- *****
--
-- 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,
    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,
    LocationRelatedDataRequest,
    LocationRelatedDataResponse,
    LocationRelatedDataFailure,
    InformationTransferIndication,
    InformationTransferConfirmation,
    InformationTransferFailure,
    UESpecificInformationIndication
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-RelocationCancel,
id-RelocationComplete,
id-RelocationDetect,
id-RelocationPreparation,
id-RelocationResourceAllocation,
id-Reset,
id-SRNS-ContextTransfer,
id-SRNS-DataForward,
id-SecurityModeControl,
id-ResetResource,
id-UESpecificInformation
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.2 not shown

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-2 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-ReleaseRequest
  iu-ReleaseRequest
  relocationDetect
  relocationComplete
  paging
  commonID
  cN-InvokeTrace
  cN-DeactivateTrace
  locationReportingControl
  locationReport
  initialUE-Message
  directTransfer
  overloadControl
  errorIndication
  sRNS-DataForward
  forwardSRNS-Context
  privateMessage
  rANAP-Relocation
  ...
  rAB-ModifyRequest
  uESpecificInformation
}

```

```

RANAP-ELEMENTARY-PROCEDURES-CLASS-3 RANAP-ELEMENTARY-PROCEDURE ::= {
  rAB-Assignment
  ...
}

```

```

-- *****
--
-- Interface Elementary Procedures
--
-- *****

```

```

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
}
```

END

### 9.3.3 PDU Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    ClientType,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GERAN-BSC-Container,
    GERAN-Classmark,
    GlobalCN-ID,
    GlobalRNC-ID,
    InformationTransferID,
    IntegrityProtectionInformation,
    InterSystemInformation-TransparentContainer,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
    L3-Information,
    LAI,
    LastKnownServiceArea,
    NAS-PDU,
    NAS-SynchronisationIndicator,
    NewBSS-To-OldBSS-Information,
    NonSearchingIndication,
    NumberOfSteps,
    OMC-ID,
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    PositioningPriority,
    ProvidedData,
    RAB-ID,
    RAB-Parameters,
    RAC,
    RelocationType,
    RequestType,
    Requested-RAB-Parameter-Values,
    ResponseTime,
    RRC-Container,
    SAI,
    SAPI,
    Service-Handover,
    SNA-Access-Information,
    SourceID,

```

SourceRNC-ToTargetRNC-TransparentContainer,  
 TargetID,  
 TargetRNC-ToSourceRNC-TransparentContainer,  
 TemporaryUE-ID,  
 TraceReference,  
 TraceType,  
 UnsuccessfullyTransmittedDataVolume,  
 TransportLayerAddress,  
 TriggerID,  
 UE-ID,  
UESBI-Iu,  
 UL-GTP-PDU-SequenceNumber,  
 UL-N-PDU-SequenceNumber,  
 UP-ModeVersions,  
 UserPlaneMode,  
 VerticalAccuracyCode,  
 Alt-RAB-Parameters,  
 Ass-RAB-Parameters

FROM RANAP-IES

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

FROM RANAP-Containers

maxNrOfDTs,  
 maxNrOfErrors,  
 maxNrOfIuSigConIds,  
 maxNrOfRABs,  
 maxNrOfVol,

id-AreaIdentity,  
 id-Alt-RAB-Parameters,  
 id-Ass-RAB-Parameters,  
 id-BroadcastAssistanceDataDecipheringKeys,  
 id-LocationRelatedDataRequestType,  
 id-CN-DomainIndicator,  
 id-Cause,  
 id-ChosenEncryptionAlgorithm,  
 id-ChosenIntegrityProtectionAlgorithm,  
 id-ClassmarkInformation2,  
 id-ClassmarkInformation3,  
 id-ClientType,  
 id-CriticalityDiagnostics,  
 id-DRX-CycleLengthCoefficient,  
 id-DirectTransferInformationItem-RANAP-RelocInf,  
 id-DirectTransferInformationList-RANAP-RelocInf,  
 id-DL-GTP-PDU-SequenceNumber,  
 id-EncryptionInformation,  
 id-GERAN-BSC-Container,  
 id-GERAN-Classmark,  
 id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item,  
 id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse,  
 id-GlobalCN-ID,  
 id-GlobalRNC-ID,  
 id-InformationTransferID,  
 id-IntegrityProtectionInformation,  
 id-InterSystemInformation-TransparentContainer,  
 id-IuSigConId,  
 id-IuSigConIdItem,  
 id-IuSigConIdList,  
 id-IuTransportAssociation,  
 id-KeyStatus,  
 id-L3-Information,  
 id-LAI,  
 id-LastKnownServiceArea,  
 id-LocationRelatedDataRequestTypeSpecificToGERANIuMode,  
 id-NAS-PDU,  
 id-NewBSS-To-OldBSS-Information,  
 id-NonSearchingIndication,  
 id-NumberOfSteps,  
 id-OMC-ID,  
 id-OldBSS-ToNewBSS-Information,  
 id-PagingAreaID,

```

id-PagingCause,
id-PermanentNAS-UE-ID,
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-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-ResponseTime,
id-SAI,
id-SAPI,
id-SNA-Access-Information,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-SourceRNC-PDCP-context-info,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UESBI-Iu,
id-UL-GTP-PDU-SequenceNumber,
id-VerticalAccuracyCode
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown
--

```

-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Relocation Request
--
-- *****

```

```

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

```



```

}
...
}
RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE optional  } |
  { ID id-Cause                        CRITICALITY ignore  TYPE Cause                PRESENCE
mandatory  } |
  { ID id-CN-DomainIndicator           CRITICALITY reject  TYPE CN-DomainIndicator
    PRESENCE mandatory  } |
  { ID id-SourceRNC-ToTargetRNC-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  },
  ...
}

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 99 to enable specific behaviour by the RNC in relation with early UE
handling --
  { ID id-UESBI-Iu                       CRITICALITY ignore  EXTENSION UESBI-Iu  PRESENCE optional },
  ...
}

```

}

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- COMMON ID ELEMENTARY PROCEDURE
--
-- *****
-- *****
--
-- Common ID
--
-- *****

CommonID ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {CommonID-IEs} },
    protocolExtensions   ProtocolExtensionContainer { {CommonIDExtensions} }
    OPTIONAL,
    ...
}

CommonID-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE mandatory },
    ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable shared networks in connected mode --
    { ID id-SNA-Access-Information      CRITICALITY ignore  EXTENSION  SNA-Access-Information
    PRESENCE optional } }7
-- Extension for Release 99 to enable specific behaviour by the RNC in relation with early UE
handling --
    { ID id-UESBI-Iu          CRITICALITY ignore          EXTENSION UESBI-Iu  PRESENCE optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- 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 ::= {
    ...
}

-- *****
--
-- UE SPECIFIC INFORMATION ELEMENTARY PROCEDURE
--
-- *****
--
-- UE Specific Information Indication
--

```

```
-- *****  
UESpecificInformationIndication ::= SEQUENCE {  
    protocolIEs          ProtocolIE-Container    { {UESpecificInformationIndicationIEs} },  
    protocolExtensions  ProtocolExtensionContainer { {UESpecificInformationIndicationExtensions}  
} OPTIONAL,  
    ...  
}  
UESpecificInformationIndicationIEs RANAP-PROTOCOL-IES ::= {  
    { ID id-UESBI-Iu          CRITICALITY ignore TYPE UESBI-Iu          PRESENCE  
optional },  
    ...  
}  
UESpecificInformationIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {  
    ...  
}  
END
```

## 9.3.4 Information Element Definitions

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

RANAP-IEs {
itu-t (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
    maxNrOfErrors,
    maxNrOfPDPDirections,
    maxNrOfPoints,
    maxNrOfRABs,
    maxNrOfSRBs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination,
    maxNrOfLevels,
    maxNrOfAltValues,
    maxNrOfSNAs,
    maxNrOfLAs,
    maxNrOfPLMNsSN,

    id-CN-DomainIndicator,
    id-MessageStructure,
    id-SRB-TrCH-Mapping,
    id-TypeOfError,

    id-DownlinkCellLoadInformation,
    id-UplinkCellLoadInformation,
    id-hS-DSCH-MAC-d-Flow-ID,
    id-SignallingIndication
FROM RANAP-Constants
```

Lots of unaffected ASN1 in 9.3.4 not shown
--

```
CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    trellocalloc-expiry(7),
    unable-to-establish-during-relocation (8),
    unknown-target-rnc (9),
    relocation-cancelled (10),
    successful-relocation (11),
    requested-ciphering-and-or-integrity-protection-algorithms-not-supported (12),
    conflict-with-already-existing-integrity-protection-and-or-ciphering-information (13),
    failure-in-the-radio-interface-procedure (14),
    release-due-to-utran-generated-reason (15),
    user-inactivity (16),
    time-critical-relocation (17),
    requested-traffic-class-not-available (18),
    invalid-rab-parameters-value (19),
    requested-maximum-bit-rate-not-available (20),
    requested-guaranteed-bit-rate-not-available (21),
    requested-transfer-delay-not-achievable (22),
    invalid-rab-parameters-combination (23),
    condition-violation-for-sdu-parameters (24),
    condition-violation-for-traffic-handling-priority (25),
    condition-violation-for-guaranteed-bit-rate (26),
    user-plane-versions-not-supported (27),
    iu-up-failure (28),
    relocation-failure-in-target-CN-RNC-or-target-system(29),
    invalid-RAB-ID (30),
    no-remaining-rab (31),
    interaction-with-other-procedure (32),
    requested-maximum-bit-rate-for-dl-not-available (33),
    requested-maximum-bit-rate-for-ul-not-available (34),
    requested-guaranteed-bit-rate-for-dl-not-available (35),
```

```

requested-guaranteed-bit-rate-for-ul-not-available (36),
repeated-integrity-checking-failure (37),
requested-request-type-not-supported (38),
request-superseded (39),
release-due-to-UE-generated-signalling-connection-release (40),
resource-optimisation-relocation (41),
requested-information-not-available (42),
relocation-desirable-for-radio-reasons (43),
relocation-not-supported-in-target-RNC-or-target-system (44),
directed-retry (45),
radio-connection-with-UE-Lost (46),
rNC-unable-to-establish-all-RFCs (47),
deciphering-keys-not-available(48),
dedicated-assistance-data-not-available(49),
relocation-target-not-allowed (50),
location-reporting-congestion (51),
reduce-load-in-serving-cell (52),
no-radio-resources-available-in-target-cell (53),
gERAN-Iumode-failure (54),
access-restricted-due-to-shared-networks (55),
incoming-relocation-not-supported-due-to-PUESBINE-feature (56)
} (1..64)

```

```

CauseNon-Standard ::= INTEGER (129..256)
-- Cause value 256 shall not be used --

```

Lots of unaffected ASN1 in 9.3.4 not shown
--

```

-- U
UE-ID ::= CHOICE {
    imsi             IMSI,
    imei             IMEI,
    ...
}

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)
UP-ModeVersions               ::= BIT STRING (SIZE (16))
USCH-ID                       ::= INTEGER (0..255)

UserPlaneMode ::= ENUMERATED {
    transparent-mode,
    support-mode-for-predefined-SDU-sizes,
    ...
}

-- V
VerticalAccuracyCode          ::= INTEGER (0..127)
END

```

## 9.3.6 Constant Definitions

```

-- *****
--
-- Constant definitions
--
-- *****

RANAP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- Elementary Procedures
--
-- *****

id-RAB-Assignment                INTEGER ::= 0
id-Iu-Release                    INTEGER ::= 1
id-RelocationPreparation         INTEGER ::= 2
id-RelocationResourceAllocation  INTEGER ::= 3
id-RelocationCancel             INTEGER ::= 4
id-SRNS-ContextTransfer         INTEGER ::= 5
id-SecurityModeControl          INTEGER ::= 6
id-DataVolumeReport             INTEGER ::= 7
id-Reset                        INTEGER ::= 9
id-RAB-ReleaseRequest           INTEGER ::= 10
id-Iu-ReleaseRequest            INTEGER ::= 11
id-RelocationDetect             INTEGER ::= 12
id-RelocationComplete          INTEGER ::= 13
id-Paging                       INTEGER ::= 14
id-CommonID                    INTEGER ::= 15
id-CN-InvokeTrace              INTEGER ::= 16
id-LocationReportingControl     INTEGER ::= 17
id-LocationReport              INTEGER ::= 18
id-InitialUE-Message           INTEGER ::= 19
id-DirectTransfer               INTEGER ::= 20
id-OverloadControl             INTEGER ::= 21
id-ErrorIndication             INTEGER ::= 22
id-SRNS-DataForward            INTEGER ::= 23
id-ForwardSRNS-Context         INTEGER ::= 24
id-privateMessage              INTEGER ::= 25
id-CN-DeactivateTrace          INTEGER ::= 26
id-ResetResource               INTEGER ::= 27
id-RANAP-Relocation            INTEGER ::= 28
id-RAB-ModifyRequest           INTEGER ::= 29
id-LocationRelatedData         INTEGER ::= 30
id-InformationTransfer          INTEGER ::= 31
id-UESpecificInformation        INTEGER ::= 32

-- *****
--
-- Extension constants
--
-- *****

maxPrivateIEs                   INTEGER ::= 65535
maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs                  INTEGER ::= 65535

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

maxNrOfDTs                      INTEGER ::= 15
maxNrOfErrors                   INTEGER ::= 256
maxNrOfIuSigConIds             INTEGER ::= 250
maxNrOfPDPDirections           INTEGER ::= 2
maxNrOfPoints                   INTEGER ::= 15
maxNrOfRABs                     INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfSRBs                     INTEGER ::= 8
maxNrOfVol                      INTEGER ::= 2
maxNrOfLevels                   INTEGER ::= 256

```

```

maxNrOfAltValues          INTEGER ::= 16
maxNrOfPLMNsSN           INTEGER ::= 32
maxNrOfLAs                INTEGER ::= 65536
maxNrOfSNAs              INTEGER ::= 65536

maxRAB-Subflows          INTEGER ::= 7
maxRAB-SubflowCombination INTEGER ::= 64

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

id-AreaIdentity          INTEGER ::= 0
id-CN-DomainIndicator    INTEGER ::= 3
id-Cause                 INTEGER ::= 4
id-ChosenEncryptionAlgorithm INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2  INTEGER ::= 7
id-ClassmarkInformation3  INTEGER ::= 8
id-CriticalityDiagnostics INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber INTEGER ::= 10
id-EncryptionInformation  INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation INTEGER ::= 13
id-L3-Information        INTEGER ::= 14
id-LAI                  INTEGER ::= 15
id-NAS-PDU              INTEGER ::= 16
id-NonSearchingIndication INTEGER ::= 17
id-NumberOfSteps        INTEGER ::= 18
id-OMC-ID               INTEGER ::= 19
id-OldBSS-ToNewBSS-Information INTEGER ::= 20
id-PagingAreaID         INTEGER ::= 21
id-PagingCause          INTEGER ::= 22
id-PermanentNAS-UE-ID   INTEGER ::= 23
id-RAB-ContextItem      INTEGER ::= 24
id-RAB-ContextList      INTEGER ::= 25
id-RAB-DataForwardingItem INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem INTEGER ::= 30
id-RAB-DataVolumeReportList INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem       INTEGER ::= 34
id-RAB-FailedList       INTEGER ::= 35
id-RAB-ID               INTEGER ::= 36
id-RAB-QueuedItem       INTEGER ::= 37
id-RAB-QueuedList       INTEGER ::= 38
id-RAB-ReleaseFailedList INTEGER ::= 39
id-RAB-ReleaseItem      INTEGER ::= 40
id-RAB-ReleaseList      INTEGER ::= 41
id-RAB-ReleasedItem     INTEGER ::= 42
id-RAB-ReleasedList     INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp INTEGER ::= 44
id-RAB-RelocationReleaseItem INTEGER ::= 45
id-RAB-RelocationReleaseList INTEGER ::= 46
id-RAB-SetupItem-RelocReq INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck INTEGER ::= 48
id-RAB-SetupList-RelocReq INTEGER ::= 49
id-RAB-SetupList-RelocReqAck INTEGER ::= 50
id-RAB-SetupOrModifiedItem INTEGER ::= 51
id-RAB-SetupOrModifiedList INTEGER ::= 52
id-RAB-SetupOrModifyItem INTEGER ::= 53
id-RAB-SetupOrModifyList INTEGER ::= 54
id-RAC                 INTEGER ::= 55
id-RelocationType      INTEGER ::= 56
id-RequestType         INTEGER ::= 57
id-SAI                 INTEGER ::= 58
id-SAPI               INTEGER ::= 59
id-SourceID            INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer INTEGER ::= 61
id-TargetID            INTEGER ::= 62
id-TargetRNC-ToSourceRNC-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-DownlinkCellLoadInformation	INTEGER ::= 101
id-UplinkCellLoadInformation	INTEGER ::= 102
id-SourceRNC-PDCP-context-info	INTEGER ::= 103
id-InformationTransferID	INTEGER ::= 104
id-SNA-Access-Information	INTEGER ::= 105
id-ProvidedData	INTEGER ::= 106
id-GERAN-BSC-Container	INTEGER ::= 107
id-GERAN-Classmark	INTEGER ::= 108
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item	INTEGER ::= 109
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse	INTEGER ::= 110
id-VerticalAccuracyCode	INTEGER ::= 111
id-ResponseTime	INTEGER ::= 112
id-PositioningPriority	INTEGER ::= 113
id-ClientType	INTEGER ::= 114
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode	INTEGER ::= 115
id-SignallingIndication	INTEGER ::= 116
id-hS-DSCH-MAC-d-Flow-ID	INTEGER ::= 117
<u>id-UESBI-Iu</u>	<u>INTEGER ::= 118</u>

END