## RP#16(02) 0401

# Technical Specification Group Radio Access Network Marco Island, USA 4 - 7 June 2002

TSG_Doc_Nun	Specification	CR_Num	Revision_Num	3G_Release	CR_Subject	CR_Category	Cur_Ver_Num	New_Ver_Num	Tdoc_Num	WorkIter
RP-020401	25.413	412	3	R99	Criticality Information Decoding Failure Handling	F	3.9.0	3.10.0	R3-021184	TEI
RP-020401	25.413	413	3	Rel-4	Criticality Information Decoding Failure Handling	А	4.4.0	4.5.0	R3-021183	TEI
RP-020401	25.413	415	4	R99	SDU Format Information Presence	F	3.9.0	3.10.0	R3-021461	TEI
RP-020401	25.413	416	4	Rel-4	SDU Format Information Presence	А	4.4.0	4.5.0	R3-021462	TEI
RP-020401	25.413	437		Rel-5	Criticality Information Decoding Failure Handling	A	5.0.0	5.1.0	R3-021182	TEI
RP-020401	25.413	438	2	R99	Erroneous Security Mode Control procedure	F	3.9.0	3.10.0	R3-021649	TEI
RP-020401	25.413	439	2	Rel-4	Erroneous Security Mode Control procedure	А	4.4.0	4.5.0	R3-021650	TEI
RP-020401	25.413	440	2	Rel-5	Erroneous Security Mode Control procedure	А	5.0.0	5.1.0	R3-021651	TEI
RP-020401	25.413	444	1	Rel-5	SDU Format Information Presence	А	5.0.0	5.1.0	R3-021463	TEI
RP-020401	25.413	449		R99	"EXTENSION INDICATION" PROPOSAL	F	3.9.0	3.10.0	R3-021304	TEI
RP-020401	25.413	450		Rel-4	"EXTENSION INDICATION" PROPOSAL	A	4.4.0	4.5.0	R3-021305	TEI
RP-020401	25.413	451		Rel-5	"EXTENSION INDICATION" PROPOSAL	A	5.0.0	5.1.0	R3-021306	TEI
RP-020401	25.413	460	1	R99	RNL-TNL coordination in RANAP	F	3.9.0	3.10.0	R3-021529	TEI
RP-020401	25.413	461	1	Rel-4	RNL-TNL coordination in RANAP	A	4.4.0	4.5.0	R3-021530	TEI
RP-020401	25.413	462	1	Rel-5	RNL-TNL coordination in RANAP	A	5.0.0	5.1.0	R3-021531	TEI

RP-020401	25.413	463	2	R99	Correction of RNC lu Coordinated relocation	F	3.9.0	3.10.0	R3-021540	TEI
RP-020401	25.413	464	2	Rel-4	Correction of RNC lu Coordinated relocation	А	4.4.0	4.5.0	R3-021541	TEI
RP-020401	25.413	465	2	Rel-5	Correction of RNC lu Coordinated relocation	А	5.0.0	5.1.0	R3-021542	TEI
RP-020401	25.413	467	1	R99	Clarification for the usage of the cause value	F	3.9.0	3.10.0	R3-021496	TEI
RP-020401	25.413	468	1	Rel-4	Clarification for the usage of the cause value	А	4.4.0	4.5.0	R3-021497	TEI
RP-020401	25.413	469	1	Rel-5	Clarification for the usage of the cause value	А	5.0.0	5.1.0	R3-021498	TEI
RP-020401	25.413	441		R99	Correction of Target RNC-ID	F	3.9.0	3.10.0	R3-021197	TEI
RP-020401	25.413	442		Rel-4	Correction of Target RNC-ID	А	4.4.0	4.5.0	R3-021198	TEI
RP-020401	25.413	443		Rel-5	Correction of Target RNC-ID	A	5.0.0	5.1.0	R3-021199	TEI

		CHAN	IGE REQ	UEST	-	CR-Form-v5		
*	25	5.413 CR 412	жrev	<b>3</b> *	Current version:	3.9.0 <sup>#</sup>		
For <b>HELP</b> or	n using	this form, see bottom	of this page or	look at th	ne pop-up text ove	er the ¥ symbols.		
Proposed chang	Proposed change affects: # (U)SIM ME/UE Radio Access Network X Core Network X							
Title:	₩ Cri	riticality Information De	coding Failure	Handling				
Source:	₩ R-	WG3						
Work item code:	:∺ <mark>TE</mark>	ΞI			Date:	ay, 2002		
Category:	Deta	e one of the following cate F (correction) A (corresponds to a co B (addition of feature), C (functional modification ailed explanations of the found in 3GPP TR 21.900	rrection in an ea ion of feature) n) above categorie		Use <u>one</u> of the 2 (GS e) R96 (Re R97 (Re R98 (Re R99 (Re REL-4 (Re	99 following releases: SM Phase 2) lease 1996) lease 1997) lease 1998) lease 1999) lease 4)		
		0 1 1000		41 141	12. 1. 6			
Reason for char	Reason for change:   Section 10.3.2 specifies that "when the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedu shall be initiated with an appropriate cause value". As all decoding errors resin an Error Indication procedure being sent with a cause value of Transfer Syleror as specified in section 10.2, this specification statement is not required causes confusion.							
Summary of change:   The above-mentioned specification statement in section 10.3.2 is removed.  Impact analysis Impact assessment towards the previous version of the specification (same release): The CR has isolated impact with the previous version of the specification (same release). The impact can be considered isolated because the change affects one (or more) system function(s), namely the error handling function and has the possibility to affect existing implementations even though the change is functional and protocol compatible.								
Consequences i not approved:	Consequences if not approved:  The specification statement seems to indicate that when the criticality information cannot be decoded, it needs to be handled in a different way from handling Transfer Syntax protocol error. If not approved, this ambiguity will persist.							
Clauses affected	d: ¥	10.3.2						
Other specs	ж	X Other core specification		25.419 25.423 25.423 25.423 25.433 25.433	R4 CR 413, 25, R99 CR 095, 25, R5 CR 590, 25, R5 CR 599, R99 CR 630, 25, R5 CR 633, R5 CR 017	419 R4 CR 096, 423 R4 CR 591,		

	O&M Specifications	
Other comments:	<b>x</b>	

### How to create CRs using this form:

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- Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.
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- 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.

- Wrong order of elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

### 10.3 Abstract Syntax Error

#### 10.3.1 General

An Abstract Syntax Error occurs when the receiving functional RANAP entity:

- 1. receives IEs or IE groups that cannot be understood (unknown IE ID);
- 2. receives IEs for which the logical range is violated (e.g.: ASN.1 definition: 0 to 15, the logical range is 0 to 10 (values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message);
- 3. does not receive IEs or IE groups but according to the specified presence of the concerning object, the IEs or IE groups should have been present in the received message.
- 4. receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;
- 5. receives IEs or IE groups but according to the conditional presence of the concerning object and the specified condition, the IEs or IE groups should not have been present in the received message.

Cases 1 and 2 (not comprehended IE/IE group) are handled based on received Criticality information. Case 3 (missing IE/IE group) is handled based on Criticality information and Presence information for the missing IE/IE group specified in the version of the specification used by the receiver. Case 4 (IEs or IE groups in wrong order or with too many occurrences) and Case 5 (erroneously present conditional IEs or IE groups) result in rejecting the procedure.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error that belong to cases 1-3 act according to the Criticality Information and Presence Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclauses 10.3.4 and 10.3.5. The handling of cases 4 and 5 is specified in subclause 10.3.6.

### 10.3.2 Criticality Information

In the RANAP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended, i.e. the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.4.

In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.
- Ignore IE and Notify Sender.
- Ignore IE.

The following rules restrict when a receiving entity may consider an IE, an IE group, or an EP not comprehended (not implemented), and when action based on criticality information is applicable:

1. IE or IE group: When one new or modified IE or IE group is implemented for one EP from a standard version, then other new or modified IEs or IE groups specified for that EP in that standard version shall be considered comprehended by a receiving entity (some may still remain unsupported).

Note that this restriction is not applicable to a sending entity for constructing messages.

2. EP: The comprehension of different EPs within a standard version or between different standard versions is not mandated. Any EP that is not supported may be considered not comprehended, even if another EP from that standard version is comprehended, and action based on criticality shall be applied.

When the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedure shall be initiated with an appropriate cause value.

#### 10.3.3 Presence Information

For many IEs/IE groups which are optional according to the ASN.1 transfer syntax, RANAP specifies separately if the presence of these IEs/IE groups is optional or mandatory with respect to RNS application by means of the presence field of the concerning object of class RANAP-PROTOCOL-IES, RANAP-PROTOCOL-IES-PAIR, RANAP-PROTOCOL-EXTENSION or RANAP-PRIVATE-IES.

The presence field of the indicated classes supports three values:

- 1. Optional;
- 2. Conditional;
- 3. Mandatory.

If an IE/IE group is not included in a received message and the presence of the IE/IE group is mandatory or the presence is conditional and the condition is true according to the version of the specification used by the receiver, an abstract syntax error occurs due to a missing IE/IE group.

If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

### 10.3.4 Not comprehended IE/IE group

#### 10.3.4.1 Procedure Code

The receiving node shall treat the different types of received criticality information of the *Procedure Code* IE according to the following:

#### Reject IE:

- If a message is received with a *Procedure Code* IE marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

#### **Ignore IE and Notify Sender:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

### **Ignore IE:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the *Procedure Code* IE, the *Triggering Message* IE, and the *Procedure Criticality* IE in the *Criticality Diagnostics* IE.

#### 10.3.4.1A Type of Message

When the receiving node cannot decode the *Type of Message* IE, the Error Indication procedure shall be initiated with an appropriate cause value.

		CHAN	IGE REQ	UEST	•	CR-Form-v5
*	25	5.413 CR 413	жrev	<b>3</b> *	Current version:	4.4.0 <sup>*</sup>
For <b>HELP</b> or	n using	this form, see bottom	of this page or	look at th	e pop-up text ove	er the 器 symbols.
Proposed chang	e affec	cts: 第 (U)SIM	ME/UE	Radio A	ccess Network X	Core Network X
Title:	光 Cri	iticality Information De	coding Failure	Handling		
Source:	₩ R-\	WG3				
Work item code:	°₩ TE	≣I			Date:	ay, 2002
Category:	Deta	e one of the following cate F (correction) A (corresponds to a co B (addition of feature), C (functional modification ailed explanations of the round in 3GPP TR 21.900	errection in an ea ion of feature) n) above categorie		Use <u>one</u> of the 2 (GS e) R96 (Re R97 (Re R98 (Re R99 (Re REL-4 (Re	EL-4 following releases: M Phase 2) lease 1996) lease 1997) lease 1998) lease 1999) lease 4)
Reason for chan	Reason for change:   Section 10.3.2 specifies that "when the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedus shall be initiated with an appropriate cause value". As all decoding errors resin an Error Indication procedure being sent with a cause value of Transfer Syleror as specified in section 10.2, this specification statement is not required causes confusion.					
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Consequences i not approved:	f X	The specification st cannot be decoded Transfer Syntax pro	, it needs to be	handled i	n a different way	
Clauses affected	<b>1</b> : ₩	10.3.2				
Other specs	ж	X Other core specification		25.419 25.423 25.423 25.423 25.433 25.433	R99 CR 412, 25. R99 CR 095, 25. R5 CR 097, R99 CR 590, 25. R5 CR 599, R99 CR 630, 25. R5 CR 633, R5 CR 017	419 R4 CR 096, 423 R4 CR 591,

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- 4. receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;
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In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.
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The following rules restrict when a receiving entity may consider an IE, an IE group, or an EP not comprehended (not implemented), and when action based on criticality information is applicable:

1. IE or IE group: When one new or modified IE or IE group is implemented for one EP from a standard version, then other new or modified IEs or IE groups specified for that EP in that standard version shall be considered comprehended by a receiving entity (some may still remain unsupported).

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When the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedure shall be initiated with an appropriate cause value.

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The presence field of the indicated classes supports three values:

- 1. Optional;
- 2. Conditional;
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If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

### 10.3.4 Not comprehended IE/IE group

#### 10.3.4.1 Procedure Code

The receiving node shall treat the different types of received criticality information of the *Procedure Code* IE according to the following:

#### Reject IE:

- If a message is received with a *Procedure Code* IE marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

#### **Ignore IE and Notify Sender:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

### **Ignore IE:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the *Procedure Code* IE, the *Triggering Message* IE, and the *Procedure Criticality* IE in the *Criticality Diagnostics* IE.

#### 10.3.4.1A Type of Message

When the receiving node cannot decode the *Type of Message* IE, the Error Indication procedure shall be initiated with an appropriate cause value.

### 3GPP TSG-RAN3 Meeting #29 Gyeongju, Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

	<u> </u>								
	CHANGE REQUEST								
*	25.413 CR 415								
For <u><b>HELP</b></u> on u	ing this form, see bottom of this page or look at the pop-up text over the ₭ symbols.								
Proposed change	ffects: # (U)SIM ME/UE Radio Access Network X Core Network X								
Title:	SDU Format Information Presence								
Source: #	R-WG3								
Work item code: ₩	TEI Date: # May, 2002								
Category: #	Release: # R99  Use one of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification) C (functional modification)  Detailed explanations of the above categories can be found in 3GPP TR 21.900.  Release: # R99 Use one of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1999) R99 (Release 4) REL-4 (Release 4) REL-5 (Release 5)								
Reason for change	the SDU Parameters IE is defined as "present for RABs with the IE User Plane Mode set to 'support mode for pre-defined SDU sizes'". The User Plane Mode information may not be available in the RAB ASSIGNMENT REQUEST message for a RAB modification, so the RAN3 error handling mechanisms would not be able to properly determine presence for the SDU Format Information Parameter IE based solely on the received message.  The IEs contained in the SDU Format Information Parameter IE are the Subflow SDU Size IE and RAB Subflow Combination Bit Rate IE. This would imply that								
this information is applicable for all traffic classes.  However, in TS 23.107 the SDU Format Information Parameter is not mark relevant for the Interactive and Background traffic classes in the sections discussing these attributes (6.4.3.2 & 6.4.3.3). Since these attributes are not relevant for the Interactive and Background traffic classes it would not be appropriate to allow this combination in the RAB parameters. There is not definition for how these attributes should be used for the Interactive and Background traffic classes.									
Summary of chang	should be changed to optional with text added to the procedure sections indicating when the IE should be included. The IE should be present for RABs with User Plane Mode set to 'support mode for predefined SDU sizes' and whose traffic class is either 'Conversational' or 'Streaming'.  Impact Analysis: Impact assessment towards the previous version of the specification (same								
	release): This CR has isolated impact with the previous version of the specification (same release) because the presence of the SDU Format Information Parameter IE								

could not be determined previously from the received message only if the User

Plane Mode information was not also included in the received message. It could also be misunderstood that the SDU Format Information Parameter IE was applicable for all traffic classes.

This CR has an impact under a functional point of view.

# Consequences if not approved:

There would be a misalignment for relevant attributes between TS 23.107 and TS 25.413. Additional unintended functional support for RAB parameter combinations not described by the Stage 2 specification (TS 23.107) would be expected but not defined. User Plane support for multiple subflow SDU sizes for unintended traffic classes would be needed. The RAN3 error handling mechanisms cannot determine the presence of the IE based on the received message only.

Clauses affected:	<b>8.2.2, 8.7.2, 9.2.1.3, 9.3.4</b>
Other specs affected:	X Other core specifications
Other comments:	*

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Table 3: Class 3

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

The following applies concerning interference between Elementary Procedures:

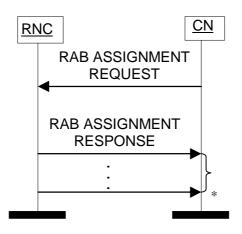
- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

### 8.2 RAB Assignment

### 8.2.1 General

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

### 8.2.2 Successful Operation



<sup>\*</sup> it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T  $_{RABAssgt}$  timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

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

For each RAB requested to modify, the message may contain:

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

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

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

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

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

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

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

Upon reception of the RAB ASSIGNMENT REQUEST message UTRAN shall execute the requested RAB configuration.

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

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

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

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

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

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

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

If the Service Handover IE is included, this tells if the RAB:

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

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

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

If the Service Handover IE is not included, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

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

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

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

- setup/modified or;
- released or;
- queued or;
- failed to setup/modify or;
- failed to release.

For the CS domain, UTRAN shall report the outcome of a specific RAB to establish or modify only after the transport network control plane signalling, which is needed for RAB establishment or modification, has been executed. The transport network control plane signalling shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification, it is up to the RNC to decide if any transport network control plane signalling shall be performed for the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE or if the already existing transport bearer shall be used. If the RNC decides to establish a new transport bearer, then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode.

If no Transport Layer Information was included in the RAB ASSIGNMENT REQUEST message at a RAB modification, no transport network control plane signalling shall occur.

For each RAB successfully modified towards the PS domain, if the RNC has changed the *Transport Layer Address* IE and/or the *Iu Transport Association* IE, it shall include the new value(s) in the RAB ASSIGNMENT RESPONSE message.

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. This initialisation is described in [6].

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

If none of the RABs have been queued, the CN shall stop timer T <sub>RABAssgt.</sub> And the RAB Assignment procedure terminates. In that case, the procedure shall also be terminated in UTRAN.

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

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

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

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

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

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

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

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

The RNC shall be prepared to receive a RAB ASSIGNMENT REQUEST message containing a *RABs To Be Released* IE at any time and shall always reply to it. If there is an ongoing RAB Assignment procedure for a RAB indicated

within the *RABs To Be Released* IE, the RNC shall discard the preceding RAB Assignment procedure for that specific RAB, release any related resources and report the released RAB within the RAB ASSIGNMENT RESPONSE message.

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

### 8.2.3 Unsuccessful Operation

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

#### 8.2.4 Abnormal Conditions

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

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

- PDP Type Information.
- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- 1. The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- 5. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

- 1. The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification of that RAB with the cause "Directed retry".
- 2. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.

- 3. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node, with the cause "Directed Retry".
- 4. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

If the source RNC receives RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection.

### 8.7 Relocation Resource Allocation

### 8.7.1 General

The purpose of the Relocation Resource Allocation procedure is to allocate resources from 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

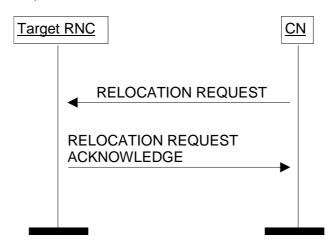


Figure 7: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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)

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

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.

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.

If the *Integrity Protection Information* IE was included in the RELOCATION REQUEST message, the RNC shall include the *Chosen Integrity Protection Algorithm* IE within the RELOCATION REQUEST ACKNOWLEDGE message, if the *Encryption Information* IE was included, the RNC shall include the *Chosen Encryption Algorithm* IE.

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

If the *NAS Synchronisation Indicator* IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the *RRC Container* IE contained in the *Target RNC to Source RNC Transparent Container* IE.

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

### 8.7.3 Unsuccessful Operation

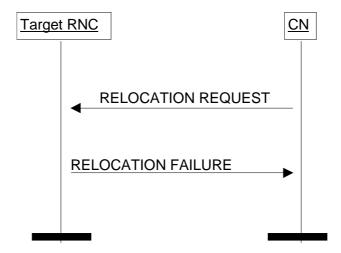


Figure 8: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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.

#### 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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the Target RNC to Source RNC Transparent Container IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the Source RNC to Target RNC Transparent Container IE in RELOCATION REQUEST message was received.

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### 9.2.1.3 RAB Parameters

The purpose of the *RAB parameters* IE group and other parameters within the *RAB parameters* IE group is to indicate all RAB attributes as defined in [7] for both directions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Traffic Class	М		ENUMERATED (conversational, streaming, interactive, background,)	Desc.: This IE indicates the type of application for which the Radio Access Bearer service is optimised
>RAB Asymmetry Indicator	M		ENUMERATED (Symmetric bidirectional, Asymmetric Uni directional downlink, Asymmetric Uni directional Uplink, Asymmetric Bidirectional,)	Desc.: This IE indicates asymmetry or symmetry of the RAB and traffic direction
>Maximum Bit Rate	M	1 to <nbr></nbr> SeparateTrafficDir ections>	INTEGER (116,000,000)	Desc.: This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The unit is: bit/s Usage: When nbr- SeparateTrafficDirections is equal to 2, then Maximum Bit Rate attribute for downlink is signalled first, then Maximum Bit Rate attribute for uplink
>Guaranteed Bit Rate	C- iftrafficCon v-Stream	0 to <nbr></nbr> br-SeparateTrafficDir ections>	INTEGER (016,000,000)	Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s Usage:  1. When nbr- SeparateTrafficDirections is equal to 2, then Guaranteed Bit Rate for downlink is signalled first, then Guaranteed Bit Rate for uplink 2. Delay and reliability attributes only apply up to the guaranteed bit rate 3. Conditional value for the case of Support Mode for pre-defined SDU sizes: Set to highest not rate controllable bitrate, where bitrate is either  — one of the RAB subflow combination bitrate IEs (when present) or  — one of the calculated values given when dividing

IE/Group Name RAB parameters	Presence	Range	IE type and reference	Semantics description
TALE PARAMETERS				the compound Subflow combination SDU sizes by the value of the IE Maximum SDU Size and then multiplying this result by the value of the IE Maximum Bit Rate.
>Delivery Order	M		ENUMERATED (delivery order requested, delivery order not requested)	Desc: This IE indicates whether the RAB shall provide insequence SDU delivery or not Usage: Delivery order requested: in sequence delivery shall be guaranteed by UTRAN on all RAB SDUs Delivery order not requested: in sequence delivery is not required from UTRAN
>Maximum SDU Size	M		INTEGER (032768)	Desc.: This IE indicates the maximum allowed SDU size The unit is: bit. Usage: Conditional value: Set to largest RAB Subflow Combination compound SDU size (when present) among the different RAB Subflow Combinations
> SDU parameters		1 to <maxrabsubflow s&gt;</maxrabsubflow 	See below	Desc.: This IE contains the parameters characterizing the RAB SDUs Usage Given per subflow with first occurence corresponding to subflow#1 etc
>Transfer Delay	C- iftrafficCon v-Stream		INTEGER (065535)	Desc.: This IE indicates the maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a RAB, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP The unit is: millisecond. Usage:
>Traffic Handling Priority	C - iftrafficInter activ		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE specifies the relative importance for handling of all SDUs belonging to the radio access bearer compared to the SDUs of other bearers Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received.
>Allocation/Retention priority	0		See below	Pesc.: This IE specifies the relative importance compared to other Radio access bearers for allocation and retention of the Radio access bearer.  Usage: If this IE is not received, the request is regarded as it cannot trigger the pre-emption process and it is vulnerable to the pre-emption process.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Source Statistics Descriptor	C- iftrafficCon v-Stream		ENUMERATED (speech, unknown,)	Desc.: This IE_specifies characteristics of the source of submitted SDUs Usage:
>Relocation Requirement	0		ENUMERATED (lossless, none,)	This IE shall be present for RABs towards the PS domain, otherwise it shall not be present. Desc.: This IE is no longer used. Usage:  It shall always be set to "none" when sent and it shall always be ignored when received.

Range Bound	Explanation
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.

Range Bound	Explanation
maxRABSubflows	Maximum number of Subflows per RAB. Value
	is 7

Condition	Explanation
IftrafficConv-Stream	This IE shall be present if the <i>Traffic Class</i> IE is set to
	"Conversational" or "Streaming".
IftrafficInteractiv	This IE shall be present if the <i>Traffic Class</i> IE is set to "Interactive".

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU parameters				
> SDU Error Ratio	C- ifErroneou sSDU			Desc.: This IE indicates the fraction of SDUs lost or detected as erroneous. This is a Reliability attribute Usage: The attribute is coded as follows: Mantissa * 10 - exponent
>>Mantissa	М		INTEGER (19)	
>>Exponent	М		INTEGER (16)	
>Residual Bit Error Ratio	M			Desc.: This IE indicates the undetected bit error ratio for each subflow in the delivered SDU. This is a Reliability attribute. Usage: The attribute is coded as follows: Mantissa * 10 - exponent

>>Mantissa	М		INTEGER (19)	
>>Exponent	М		INTEGER (18)	
>Delivery Of Erroneous SDU	M		ENUMERATED (yes, no, no- error-detection- consideration)	Desc.: This IE indicates whether SDUs with detected errors shall be delivered or not. In case of unequal error protection, the attribute is set per subflow This is a Reliability attribute Usage: Yes: error detection applied, erroneous SDU delivered No. Error detection is applied, erroneous SDU discarded no-error-detection-consideration: SDUs delivered without considering error detection If the RNC receives this IE set to 'Yes' and the User Plane Mode IE is set to 'transparent mode', it should consider it as 'no-error-detection-consideration'.
>SDU format information Parameter	C- IfSMPredef inedSDUSi zeO	1 to <maxrabsubflow Combinations&gt;</maxrabsubflow 	See below	Desc.: This IE contains the list of possible exact sizes of SDUs and/or RAB Subflow Combination bit rates. Given per RAB Subflow Combination with first occurence corresponding to RAB Subflow Combination number 1. It shall always be present for rate controllable RABs.

Range Bound	Explanation
maxRABSubflowCombinations	Maximum number of RAB Subflow
	Combinations. Value is 64.

Condition	Explanation
IfErroneousSDU	This IE shall be present if the Delivery Of Erroneous SDU IE is set
	to "Yes" or "No".
IfSMPredefinedSDUSize	This IE shall be present for RABs with the IE User Plane Mode set
	to 'support mode for pre-defined SDU sizes'.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU Format Information Parameter				At least one of the Subflow SDU size IE and the RAB Subflow Combination bit rate IE shall be present when SDU format information Parameter IE is present.  For the case subflow SDUs are transmitted at constant time interval, only one of the two IEs shall be present.
>Subflow SDU Size	0		INTEGER (04095)	Desc.: This IE indicates the exact size of the SDU. The unit is: bit. Usage: This IE is only used for RABs that have predefined SDU size(s). It shall be present for RABs having more than one subflow. For RABs having only one subflow, this IE shall be present only when the RAB is rate controllable and the SDU size of some RAB Subflow combination(s) is different than the IE Maximum SDU Size. When this IE is not present and SDU format information Parameter is present, then the Subflow SDU size for the only existing subflow takes the value of the IE Maximum SDU size.
>RAB Subflow Combination Bit Rate	0		INTEGER (016,000,000 )	Desc.: This IE indicates the RAB Subflow Combination bit rate. The unit is: bit/s. Usage: When this IE is not present and SDU format information parameter is present then all Subflow SDUs are transmitted (when there is data to be transmitted) at a constant time interval. The value of this IE shall not exceed the maximum value of the IEs 'Maximum Bit Rate'. The value 0 of RAB Subflow Combination bitrate indicates that the RAB uses discontinuous transfer of the SDUs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Allocation/Retention Priority				
>Priority Level	M		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE indicates the priority of the request. Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received. The priority level and the preemption indicators may be used to determine whether the request has to be performed unconditionally and immediately
>Pre-emption Capability	М		ENUMERATE D(shall not trigger pre- emption, may trigger pre- emption)	Descr.: This IE indicates the preemption capability of the request on other RABs Usage: The RAB shall not pre-empt other RABs or, the RAB may pre-empt other RABs The Pre-emption Capability indicator applies to the allocation of resources for a RAB and as such it provides the trigger to the pre-emption procedures/processes of the RNS.
>Pre-emption Vulnerability	М		ENUMERATE D(not pre- emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the RAB to preemption of other RABs. Usage: The RAB shall not be pre-empted by other RABs or the RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the RAB, unless modified and as such indicates whether the RAB is a target of the pre-emption procedures/processes of the RNS
>Queuing Allowed	M		ENUMERATE D(queuing not allowed, queuing allowed)	Desc.: This IE indicates whether the request can be placed into a resource allocation queue or not. Usage: Queuing of the RAB is allowed Queuing of the RAB is not allowed Queuing allowed indicator applies for the entire duration of the RAB, unless modified.

### 9.2.1.4 Cause

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

### 9.3.4 Information Element Definitions

#### SOME UNCHANGED PARTS ARE OMITTED

```
allocationOrRetentionPriority AllocationOrRetentionPriority OPTIONAL,
    sourceStatisticsDescriptor SourceStatisticsDescriptor OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming"--,
    relocationRequirement RelocationRequirement OPTIONAL,
    iE-Extensions
                           ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
RAB-SubflowCombinationBitRate ::= INTEGER (0..16000000)
RAB-TrCH-Mapping ::=
                       SEQUENCE ( SIZE (1..maxNrOfRABs)) OF
    RAB-TrCH-MappingItem
RAB-TrCH-MappingItem ::= SEQUENCE {
    rAB-ID
                   RAB-ID,
    trCH-ID-List TrCH-ID-List,
                   ::= OCTET STRING (SIZE (1))
RAC
RAI ::= SEQUENCE {
    lai
                    LAI,
    rAC
                    RAC,
    iE-Extensions
                           ProtocolExtensionContainer { {RAI-ExtIEs} } OPTIONAL,
RAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
RateControlAllowed ::= ENUMERATED {
    not-allowed,
    allowed
RelocationRequirement ::= ENUMERATED {
    lossless,
    none,
```

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```
RelocationType ::= ENUMERATED {
    ue-not-involved,
    ue-involved,
RepetitionNumber0 ::= INTEGER (0..255)
RepetitionNumber1 ::= INTEGER (1..256)
ReportArea ::= ENUMERATED {
    service-area,
    geographical-area,
RequestType ::= SEQUENCE {
    event
                        Event,
    reportArea
                        ReportArea,
    accuracyCode
                        INTEGER (0..127)
                                            OPTIONAL,
ResidualBitErrorRatio ::= SEQUENCE {
    mantissa
                      INTEGER (1..9),
    exponent
                        INTEGER (1..8),
    iE-Extensions
                            ProtocolExtensionContainer { {ResidualBitErrorRatio-ExtIEs} } OPTIONAL
-- ResidualBitErrorRatio = mantissa * 10^-exponent
ResidualBitErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
RNC-ID
                        ::= INTEGER (0..4095)
-- RNC-ID
                            ::= BIT STRING (SIZE (12))
-- Harmonized with RNSAP and NBAP definitions
RRC-Container
                           ::= OCTET STRING
-- S
SAC
                    ::= OCTET STRING (SIZE (2))
SAI ::= SEQUENCE {
                                PLMNidentity,
    pLMNidentity
    lAC
                    LAC,
    sAC
                    SAC,
    iE-Extensions
                            ProtocolExtensionContainer { {SAI-ExtIEs} } OPTIONAL
SAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
```

```
SAPI ::= ENUMERATED {
   sapi-0,
    sapi-3,
    . . .
SDU-ErrorRatio ::= SEQUENCE {
    mantissa
                       INTEGER (1..9),
    exponent
                       INTEGER (1..6),
    iE-Extensions
                           ProtocolExtensionContainer { {SDU-ErrorRatio-ExtIEs} } OPTIONAL
-- SDU-ErrorRatio = mantissa * 10^-exponent
SDU-ErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-FormatInformationParameters ::= SEQUENCE (SIZE (1..maxRAB-SubflowCombination)) OF
    SEOUENCE {
        subflowSDU-Size
                                SubflowSDU-Size
                                                    OPTIONAL,
        rAB-SubflowCombinationBitRate RAB-SubflowCombinationBitRate OPTIONAL,
                                ProtocolExtensionContainer { {SDU-FormatInformationParameters-ExtIEs} } OPTIONAL,
       iE-Extensions
SDU-FormatinformationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-Parameters ::= SEQUENCE (SIZE (1..maxRAB-Subflows)) OF
    SEQUENCE {
        sDU-ErrorRatio
                                SDU-ErrorRatio OPTIONAL
        -- This IE shall be present if the Delivery Of Erroneous SDU IE is set to "Yes" or "No"--,
        residualBitErrorRatio
                                    ResidualBitErrorRatio,
        deliveryOfErroneousSDU
                                    DeliveryOfErroneousSDU,
        sDU-FormatInformationParameters SDU-FormatInformationParameters OPTIONAL
        -- This IE shall be present for RABs with the IE User Plane Mode set to support mode for predefined SDU sizes --,
                                ProtocolExtensionContainer { {SDU-Parameters-ExtIEs} } OPTIONAL,
       iE-Extensions
SDU-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Service-Handover ::= ENUMERATED {
    handover-to-GSM-should-be-performed,
    handover-to-GSM-should-not-be-performed,
    handover-to-GSM-shall-not-be-performed,
```

### 3GPP TSG-RAN3 Meeting #29 Gyeongju, Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

	CHAN	GE REQ	UEST	•		CR-Form-v5
¥ 25	5.413 CR 416	жrev	<b>4</b> *	Current version	on: <b>4.4.0</b>	¥
For <u><b>HELP</b></u> on using	this form, see bottom o	of this page or	look at th	e pop-up text o	over the <b>%</b> syr	mbols.
Proposed change affect	cts: 第 (U)SIM	ME/UE	Radio Ad	ccess Network	X Core Ne	etwork X
Title: 第 SD	OU Format Information	Presence				
Source: # R-1	WG3					
Work item code: 第 TE	1			Date: 黑	May, 2002	
Deta	e <u>one</u> of the following cate <b>F</b> (correction) <b>A</b> (corresponds to a cor <b>B</b> (addition of feature), <b>C</b> (functional modification <b>D</b> (editorial modification  ailed explanations of the a  ound in 3GPP TR 21.900	rection in an ear on of feature) o) above categories		2 (( P) R96 (I R97 (I R98 (I R99 (I REL-4 (I	ne following rele GSM Phase 2) Release 1996) Release 1997) Release 1998) Release 1999) Release 4) Release 5)	eases:
Reason for change: #	Current definition for the SDU Parameters Mode set to 'support information may not for a RAB modification able to properly determined in SDU Size IE and RAT this information is appropriate to allow definition for how the Background traffic cl	s IE is defined at mode for pre- be available in on, so the RAN armine presence received me at the SDU Form AB Subflow Couplicable for all or the SDU Form active and Bactive	as "prese defined S the RAB 3 error have for the essage. mat Information traffic class ormat Information & 6.4.3.3 okground for in the F	nt for RABs with the second sizes.  ASSIGNMENT and ling mechan second se	th the IE User e User Plane T REQUEST I nisms would r nformation Par ter IE are the his would imp neter is not ma in the sections attributes are it would not be rs. There is no	Plane Mode message not be rameter  Subflow ly that  arked as a not
Summary of change: ₩	The condition for the should be changed to indicating when the with User Plane Mootraffic class is either	o optional with IE should be in de set to 'suppo	text addedcluded. Tort mode	ed to the proce The IE should b for predefined	dure sections e present for	RABs

Impact Analysis:

Impact assessment towards the previous version of the specification (same release):

This CR has isolated impact with the previous version of the specification (same release) because the presence of the SDU Format Information Parameter IE could not be determined previously from the received message only if the User

Plane Mode information was not also included in the received message. It could also be misunderstood that the SDU Format Information Parameter IE was applicable for all traffic classes.

This CR has an impact under a functional point of view.

# Consequences if not approved:

There would be a misalignment for relevant attributes between TS 23.107 and TS 25.413. Additional unintended functional support for RAB parameter combinations not described by the Stage 2 specification (TS 23.107) would be expected but not defined. User Plane support for multiple subflow SDU sizes for unintended traffic classes would be needed. The RAN3 error handling mechanisms cannot determine the presence of the IE based on the received message only.

Clauses affected:	H	8.2.2, 8.7.2, 9.2.1.3, 9.3.4		
Other space	φ.	X Other core specifications	എ	25.413 R99 CR 415, 25.413 R5 CR 444
Other specs	Ժ		ж	25.415 K99 CK 415, 25.415 K5 CK 444
affected:		Test specifications		None.
		O&M Specifications		
Other comments:	Ж			

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

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

- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

Table 3: Class 3

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

The following applies concerning interference between Elementary Procedures:

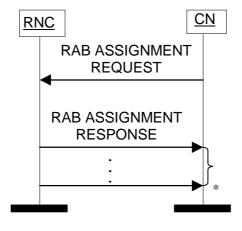
- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

### 8.2 RAB Assignment

### 8.2.1 General

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

### 8.2.2 Successful Operation



<sup>\*</sup> it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T  $_{RABAssgt}$  timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

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

For each RAB requested to modify, the message may contain:

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

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

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

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

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

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

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

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

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

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

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

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

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

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

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

If the Service Handover IE is included, this tells if the RAB

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

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

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

If the Service Handover IE is not included, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

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

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

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

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

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

For the CS domain, UTRAN shall report the outcome of a specific RAB to establish or modify only after the transport network control plane signalling, which is needed for RAB establishment or modification, has been executed. At a RAB establishment, the transport network control plane signalling shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification, it is up to the RNC to decide if any transport network control plane signalling shall be performed or if the already existing transport bearer shall be used. If the RNC decides to establish a new transport bearer, the transport network control plane signalling shall use the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If the RNC decides to modify the already existing transport bearer, the transport network control plane signalling shall not use the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE. That is, re-binding with *Iu Transport Association* IE shall not be done.

For each RAB successfully modified towards the PS domain, if the RNC has changed the *Transport Layer Address* IE and/or the *Iu Transport Association* IE, it shall include the new value(s) in the RAB ASSIGNMENT RESPONSE message.

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane 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 Assignment shall fail with the cause value "RNC unable to establish all RFCs".

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

If none of the RABs have been queued, the CN shall stop timer T <sub>RABAssgt.</sub> And the RAB Assignment procedure terminates. In that case, the procedure shall also be terminated in UTRAN.

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

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

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

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

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

When UTRAN reports unsuccessful establishment/modification of a RAB, the cause value should be precise enough to enable the core network to know the reason for unsuccessful establishment/modification. Typical cause values are: "Requested Traffic Class not Available", "Invalid RAB Parameters Value", "Requested Maximum Bit Rate not Available", "Requested Maximum Bit Rate for UL not Available", "Requested Guaranteed Bit Rate for UL not Available", "Requested Transfer Delay not Achievable", "Invalid RAB

Parameters Combination", "Condition Violation for SDU Parameters", "Condition Violation for Traffic Handling Priority", "Condition Violation for Guaranteed Bit Rate", "User Plane Versions not Supported", "Iu UP Failure", "Iu Transport Connection Failed to Establish".

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

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

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

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

## 8.2.3 Unsuccessful Operation

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

#### 8.2.4 Abnormal Conditions

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

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

- PDP Type Information.
- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- 5. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

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

If the source RNC receives RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection.

### 8.7 Relocation Resource Allocation

#### 8.7.1 General

The purpose of the Relocation Resource Allocation procedure is to allocate resources from 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

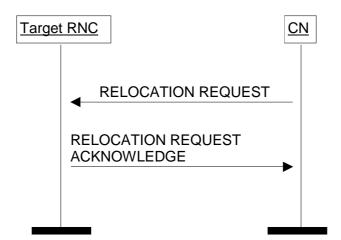


Figure 7: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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  $T_{\text{RELOCalloc.}}$ 

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

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

The RELOCATION REQUEST message shall contain 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)

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

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

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 by 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 *Integrity Protection Information* IE was included in the RELOCATION REQUEST message, the RNC shall include the *Chosen Integrity Protection Algorithm* IE within the RELOCATION REQUEST ACKNOWLEDGE message, if the *Encryption Information* IE was included, the RNC shall include the *Chosen Encryption Algorithm* IE.

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

If the *NAS Synchronisation Indicator* IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the *RRC Container* IE contained in the *Target RNC to Source RNC Transparent Container* IE.

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

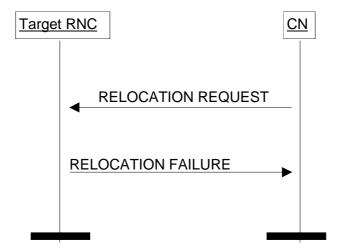


Figure 8: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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.

#### **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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.

- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container* IE in RELOCATION REQUEST message was received.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB ID	M		BIT STRING	
			(8)	

## 9.2.1.3 RAB Parameters

The purpose of the RAB parameters IE group and other parameters within the RAB parameters IE group is to indicate all RAB attributes as defined in [7] for both directions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Traffic Class	M		ENUMERATED (conversational, streaming, interactive, background,)	<b>Desc.:</b> This IE indicates the typof application for which the Radio Access Bearer service is optimised
>RAB Asymmetry Indicator	M		ENUMERATED (Symmetric bidirectional, Asymmetric Uni directional downlink, Asymmetric Uni directional Uplink, Asymmetric Bidirectional,)	Desc.: This IE indicates asymmetry or symmetry of the RAB and traffic direction
>Maximum Bit Rate	M	1 to <nbr></nbr> SeparateTrafficDir ections>	INTEGER (116,000,000)	Desc.: This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a perior of time, divided by the duration of the period. The unit is: bit/s Usage: When nbr- SeparateTrafficDirections is equal to 2, then Maximum Bit Rate attribute for downlink is signalled first, then Maximum Brate attribute for uplink
>Guaranteed Bit Rate	C-iftrafficCon v-Stream	0 to <nbr></nbr> br-SeparateTrafficDir ections>	INTEGER (016,000,000)	Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s Usage:  1. When nbr-SeparateTrafficDirections equal to 2, then Guaranteed Bit Rate for downlink is signalled first, then Guaranteed Bit Rate for uplink 2. Delay and reliability attributes only apply up to the guaranteed bit rate 3. Conditional valuefor the case of Support Mode for pre-defined SDU sizes: Set to highest not rate controllable bitrate, where bitrate is either  — one of the RAB subflow combination bitrate IEs (when present) or  — one of the calculated

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				the compound Subflow
				combination SDU sizes by the value of the IE Maximum SDU Size and then multiplying this result by the value of the IE Maximum Bit Rate.
>Delivery Order  >Maximum SDU Size	M		ENUMERATED (delivery order requested, delivery order not requested)  INTEGER (032768)	Desc: This IE indicates whether the RAB shall provide insequence SDU delivery or not Usage: Delivery order requested: in sequence delivery shall be guaranteed by UTRAN on all RAB SDUs Delivery order not requested: in sequence delivery is not required from UTRAN  Desc.: This IE indicates the maximum allowed SDU size The unit is: bit.
				Usage: Conditional value: Set to largest RAB Subflow Combination compound SDU size (when present) among the different RAB Subflow Combinations
>SDU parameters		1 to <maxrabsubflow s&gt;</maxrabsubflow 	See below	Desc.: This IE contains the parameters characterizing the RAB SDUs Usage Given per subflow with first occurence corresponding to subflow#1 etc
>Transfer Delay	C- iftrafficCon v-Stream		INTEGER (065535)	Desc.: This IE indicates the maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a RAB, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP The unit is: millisecond.  Usage:
>Traffic Handling Priority	C - iftrafficInter activ		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE specifies the relative importance for handling of all SDUs belonging to the radio access bearer compared to the SDUs of other bearers Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received.
>Allocation/Retention priority	0		See below	Desc.: This IE specifies the relative importance compared to other Radio access bearers for allocation and retention of the Radio access bearer.  Usage: If this IE is not received, the request is regarded as it cannot trigger the pre-emption process and it is vulnerable to the pre-emption process.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Source Statistics Descriptor	C- iftrafficCon v-Stream		ENUMERATED (speech, unknown,)	Desc.: This IE_specifies characteristics of the source of submitted SDUs Usage:
>Relocation Requirement	0		ENUMERATED (lossless, none,, realtime)	This IE shall be present for RABs towards the PS domain, otherwise it shall not be present. <b>Desc.:</b> This IE is no longer used. <b>Usage:</b> It shall always be set to "none" when sent and it shall always be ignored when received.

Range Bound	Explanation
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.

Range Bound	Explanation
maxRABSubflows	Maximum number of Subflows per RAB. Value
	is 7

Condition	Explanation		
IftrafficConv-Stream	This IE shall be present if the <i>Traffic Class</i> IE is set to		
	"Conversational" or "Streaming"		
IftrafficInteractiv	This IE shall be present if the <i>Traffic Class</i> IE is set to "Interactive"		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU parameters				
> SDU Error Ratio	C- ifErroneou sSDU			Desc.: This IE indicates the fraction of SDUs lost or detected as erroneous. This is a Reliability attribute Usage: The attribute is coded as follows: Mantissa * 10 - exponent
>>Mantissa	M		INTEGER (19)	
>>Exponent	M		INTEGER (16)	
>Residual Bit Error Ratio	M			Desc.: This IE indicates the undetected bit error ratio for each subflow in the delivered SDU. This is a Reliability attribute. Usage: The attribute is coded as follows: Mantissa * 10 - exponent

>>Mantissa	M		INTEGER (19)	
>>Exponent	М		INTEGER (18)	
>Delivery Of Erroneous SDU	M		ENUMERATED (yes, no, no- error-detection- consideration)	Desc.: This IE indicates whether SDUs with detected errors shall be delivered or not. In case of unequal error protection, the attribute is set per subflow This is a Reliability attribute Usage: Yes: error detection applied, erroneous SDU delivered No. Error detection is applied, erroneous SDU discarded no-error-detection-consideration: SDUs delivered without considering error detection. If the RNC receives this IE set to 'Yes' and the User Plane Mode IE is set to 'transparent mode', it should consider it as 'no-error-detection-consideration'.
>SDU format information Parameter	C- IfSMPredef inedSDUSi zeO	1 to <maxrabsubflow Combinations&gt;</maxrabsubflow 	See below	Desc.: This IE contains the list of possible exact sizes of SDUs and/or RAB Subflow Combination bit rates. Given per RAB Subflow Combination with first occurence corresponding to RAB Subflow Combination number 1. It shall always be present for rate controllable RABs.

Range Bound	Explanation	
maxRABSubflowCombinations	Maximum number of RAB Subflow	
	Combinations. Value is 64.	

Condition	Explanation
IfErroneousSDU	This IE shall be present if the Delivery Of Erroneous SDU IE is set
	to "Yes" or "No".
IfSMPredefinedSDUSize	This IE shall be present for RABs with the IE User Plane Mode set
	to 'support mode for pre-defined SDU sizes'.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU Format Information Parameter				At least one of the Subflow SDU size IE and the RAB Subflow Combination bit rate IE shall be present when SDU format information Parameter IE is present. For the case subflow SDUs are transmitted at constant time interval, only one of the two IEs shall be present.
>Subflow SDU Size	O		INTEGER (04095)	Desc.: This IE indicates the exact size of the SDU. The unit is: bit. Usage: This IE is only used for RABs that have predefined SDU size(s). It shall be present for RABs having more than one subflow. For RABs having only one subflow, this IE shall be present only when the RAB is rate controllable and the SDU size of some RAB Subflow Combination(s) is different than the IE Maximum SDU Size. When this IE is not present and SDU format information Parameter is present, then the Subflow SDU size for the only existing subflow takes the value of the IE Maximum SDU size.
>RAB Subflow Combination Bit Rate	0		INTEGER (016,000,000 )	Desc.: This IE indicates the RAB Subflow Combination bit rate. The unit is: bit/s. Usage: When this IE is not present and SDU format information parameter is present then all Subflow SDUs are transmitted (when there is data to be transmitted) at a constant time interval. The value of this IE shall not exceed the maximum value of the IEs 'Maximum Bit Rate'. The value 0 of RAB Subflow Combination bitrate indicates that the RAB uses discontinuous transfer of the SDUs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Allocation/Retention Priority				
>Priority Level	M		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE indicates the priority of the request. Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received. The priority level and the preemption indicators may be used to determine whether the request has to be performed unconditionally and immediately
>Pre-emption Capability	M		ENUMERATE D(shall not trigger pre- emption, may trigger pre- emption)	Descr.: This IE indicates the preemption capability of the request on other RABs Usage: The RAB shall not pre-empt other RABs or, the RAB may pre-empt other RABs The Pre-emption Capability indicator applies to the allocation of resources for a RAB and as such it provides the trigger to the pre-emption procedures/processes of the RNS.
>Pre-emption Vulnerability	M		ENUMERATE D(not pre- emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the RAB to preemption of other RABs. Usage: The RAB shall not be pre-empted by other RABs or the RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the RAB, unless modified and as such indicates whether the RAB is a target of the pre-emption procedures/processes of the RNS
>Queuing Allowed	M		ENUMERATE D(queuing not allowed, queuing allowed)	Desc.: This IE indicates whether the request can be placed into a resource allocation queue or not. Usage: Queuing of the RAB is allowed Queuing of the RAB is not allowed Queuing allowed indicator applies for the entire duration of the RAB, unless modified.

# 9.2.1.4 Cause

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

## 9.3.4 Information Element Definitions

#### SOME UNCHANGED PARTS ARE OMITTED

```
TrafficHandlingPriority OPTIONAL
    trafficHandlingPriority
    -- This IE shall be present the traffic class IE is set to "Interactive" --,
    allocationOrRetentionPriority AllocationOrRetentionPriority OPTIONAL,
    sourceStatisticsDescriptor SourceStatisticsDescriptor OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    relocationRequirement RelocationRequirement OPTIONAL,
                            ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
    iE-Extensions
RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
RAB-SubflowCombinationBitRate ::= INTEGER (0..16000000)
RAB-TrCH-Mapping ::=
                        SEQUENCE ( SIZE (1..maxNrOfRABs)) OF
    RAB-TrCH-MappingItem
RAB-TrCH-MappingItem ::= SEQUENCE {
    rAB-ID
                    RAB-ID,
    trCH-ID-List
                    TrCH-ID-List,
RAC
                    ::= OCTET STRING (SIZE (1))
RAI ::= SEOUENCE {
    lai
                    LAI,
    rAC
                    RAC,
    iE-Extensions
                            ProtocolExtensionContainer { {RAI-ExtIEs} } OPTIONAL,
RAI-ExtIES RANAP-PROTOCOL-EXTENSION ::= {
RateControlAllowed ::= ENUMERATED {
    not-allowed,
    allowed
RelocationRequirement ::= ENUMERATED {
    lossless,
    none,
    . . . .
```

```
realtime
RelocationType ::= ENUMERATED {
   ue-not-involved,
   ue-involved,
RepetitionNumber0 ::= INTEGER (0..255)
RepetitionNumber1 ::= INTEGER (1..256)
ReportArea ::= ENUMERATED {
   service-area,
   geographical-area,
RequestedGPSAssistanceData ::= OCTET STRING (SIZE (1 .. 38 ))
        -- qpsAssistanceData as defined in 24.080 --
RequestedLocationRelatedDataType ::= ENUMERATED {
   decipheringKeysUEBasedOTDOA,
    decipheringKeysAssistedGPS,
    dedicatedAssistanceDataUEBasedOTDOA.
   dedicatedAssistanceDataAssistedGPS.
Requested-RAB-Parameter-Values ::= SEQUENCE {
    requestedMaxBitrates
                                        Requested-RAB-Parameter-MaxBitrateList
                                                                                        OPTIONAL,
    requestedGuaranteedBitrates
                                            Requested-RAB-Parameter-GuaranteedBitrateList
                                                                                                  OPTIONAL,
    iE-Extensions
                            ProtocolExtensionContainer { { Requested-RAB-Parameter-Values-ExtIEs} } OPTIONAL,
Requested-RAB-Parameter-Values-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Requested-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
Requested-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
RequestType ::= SEQUENCE {
   event
                        Event,
    reportArea
                        ReportArea,
                                INTEGER (0..127)
   horizontalAccuracyCode
                                                    OPTIONAL,
   verticalAccuracyCode
                                    INTEGER (0..127)
                                                        OPTIONAL,
```

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```
-- To be used if Geographical Coordinates shall be reported with a requested accuracy. --
    responseTime
                                   ResponseTime OPTIONAL,
    -- This IE shall be present if the Event IE is set to 'Direct' and the Report Area IE is set to 'Geographical Area'. --
    positioningPriority
                                   PositioningPriority OPTIONAL,
    -- This IE shall be present if the Event IE is set to 'Direct' or "Change of Service Area". --
                                   ClientType OPTIONAL
    clientType
    -- This IE shall be present if the Event IE is set to 'Direct'. --
ResidualBitErrorRatio ::= SEQUENCE {
               INTEGER (1..9),
    mantissa
    exponent
                       INTEGER (1..8),
                           ProtocolExtensionContainer { {ResidualBitErrorRatio-ExtIEs} } OPTIONAL
    iE-Extensions
-- ResidualBitErrorRatio = mantissa * 10^-exponent
ResidualBitErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
ResponseTime
               ::= ENUMERATED {
    lowdelay,
    delaytolerant,
RNC-ID
                        ::= INTEGER (0..4095)
-- RNC-ID
                            ::= BIT STRING (SIZE (12))
-- Harmonized with RNSAP and NBAP definitions
RRC-Container
                          ::= OCTET STRING
-- S
SAC
                   ::= OCTET STRING (SIZE (2))
SAI ::= SEQUENCE {
    pLMNidentity
                                PLMNidentity,
    lac
                   LAC,
    sAC
                   SAC,
                            ProtocolExtensionContainer { {SAI-ExtIEs} } OPTIONAL
    iE-Extensions
SAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SAPI ::= ENUMERATED {
    sapi-0,
    sapi-3,
```

```
SDU-ErrorRatio ::= SEQUENCE {
                        INTEGER (1..9),
   mantissa
                        INTEGER (1..6),
   exponent
    iE-Extensions
                            ProtocolExtensionContainer { {SDU-ErrorRatio-ExtIEs} } OPTIONAL
-- SDU-ErrorRatio = mantissa * 10^-exponent
SDU-ErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-FormatInformationParameters ::= SEQUENCE (SIZE (1..maxRAB-SubflowCombination)) OF
    SEQUENCE +
        subflowSDU-Size
                                SubflowSDU-Size
                                                    OPTIONAL.
        rAB-SubflowCombinationBitRate RAB-SubflowCombinationBitRate OPTIONAL,
                                ProtocolExtensionContainer { {SDU-FormatInformationParameters-ExtIEs} } OPTIONAL,
        iE-Extensions
SDU-FormatInformationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-Parameters ::= SEQUENCE (SIZE (1..maxRAB-Subflows)) OF
   SEQUENCE {
        sDU-ErrorRatio
                               SDU-ErrorRatio OPTIONAL
        -- This IE shall be present if the Delivery Of Erroneous SDU IE is set to "Yes" or "No" --,
                                    ResidualBitErrorRatio,
        residualBitErrorRatio
        deliveryOfErroneousSDU
                                    DeliveryOfErroneousSDU,
        sDU-FormatInformationParameters SDU-FormatInformationParameters OPTIONAL
        -- This IE shall be present for RABs with the IE User Plane Mode set to support mode for predefined SDU sizes --,
        iE-Extensions
                                ProtocolExtensionContainer { {SDU-Parameters-ExtIEs} } OPTIONAL,
SDU-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Service-Handover ::= ENUMERATED {
   handover-to-GSM-should-be-performed,
   handover-to-GSM-should-not-be-performed,
   handover-to-GSM-shall-not-be-performed,
    . . .
SourceID ::= CHOICE {
    sourceRNC-ID
                            SourceRNC-ID,
                    SAI,
    sAI
```

# 3GPP TSG-RAN3 Meeting #29 Gyeongju, Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

			CH	IANGE	REC	UE	ST				CR-Form-v5
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	O&M Specifications	
Other comments:	<b>x</b>	

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

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

- 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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

- Violation in list element constraints. e.g.: If a list is defined as containing 1 to 10 elements, and 12 elements will be received, than this case will be handled as a transfer syntax error.
- Missing mandatory elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).
- Wrong order of elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

# 10.3 Abstract Syntax Error

#### 10.3.1 General

An Abstract Syntax Error occurs when the receiving functional RANAP entity:

- 1. receives IEs or IE groups that cannot be understood (unknown IE ID);
- 2. receives IEs for which the logical range is violated (e.g.: ASN.1 definition: 0 to 15, the logical range is 0 to 10 (values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message);
- 3. does not receive IEs or IE groups but according to the specified presence of the concerning object, the IEs or IE groups should have been present in the received message.
- 4. receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;
- 5. receives IEs or IE groups but according to the conditional presence of the concerning object and the specified condition, the IEs or IE groups should not have been present in the received message.

Cases 1 and 2 (not comprehended IE/IE group) are handled based on received Criticality information. Case 3 (missing IE/IE group) is handled based on Criticality information and Presence information for the missing IE/IE group specified in the version of the specification used by the receiver. Case 4 (IEs or IE groups in wrong order or with too many occurrences) and Case 5 (erroneously present conditional IEs or IE groups) result in rejecting the procedure.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error that belong to cases 1-3 act according to the Criticality Information and Presence Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclauses 10.3.4 and 10.3.5. The handling of cases 4 and 5 is specified in subclause 10.3.6.

# 10.3.2 Criticality Information

In the RANAP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended, i.e. the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.4.

In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.
- Ignore IE and Notify Sender.
- Ignore IE.

The following rules restrict when a receiving entity may consider an IE, an IE group, or an EP not comprehended (not implemented), and when action based on criticality information is applicable:

1. IE or IE group: When one new or modified IE or IE group is implemented for one EP from a standard version, then other new or modified IEs or IE groups specified for that EP in that standard version shall be considered comprehended by a receiving entity (some may still remain unsupported).

Note that this restriction is not applicable to a sending entity for constructing messages.

2. EP: The comprehension of different EPs within a standard version or between different standard versions is not mandated. Any EP that is not supported may be considered not comprehended, even if another EP from that standard version is comprehended, and action based on criticality shall be applied.

When the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedure shall be initiated with an appropriate cause value.

#### 10.3.3 Presence Information

For many IEs/IE groups which are optional according to the ASN.1 transfer syntax, RANAP specifies separately if the presence of these IEs/IE groups is optional or mandatory with respect to RNS application by means of the presence field of the concerning object of class RANAP-PROTOCOL-IES, RANAP-PROTOCOL-IES-PAIR, RANAP-PROTOCOL-EXTENSION or RANAP-PRIVATE-IES.

The presence field of the indicated classes supports three values:

- 1. Optional;
- 2. Conditional;
- 3. Mandatory.

If an IE/IE group is not included in a received message and the presence of the IE/IE group is mandatory or the presence is conditional and the condition is true according to the version of the specification used by the receiver, an abstract syntax error occurs due to a missing IE/IE group.

If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

# 10.3.4 Not comprehended IE/IE group

### 10.3.4.1 Procedure Code

The receiving node shall treat the different types of received criticality information of the *Procedure Code* IE according to the following:

#### Reject IE:

- If a message is received with a *Procedure Code* IE marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

### **Ignore IE and Notify Sender:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

#### **Ignore IE:**

- If a message is received with a *Procedure Code* IE marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the *Procedure Code* IE, the *Triggering Message* IE, and the *Procedure Criticality* IE in the *Criticality Diagnostics* IE.

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongiu, Korea, May 13<sup>th</sup> – 17<sup>th</sup>, 2002

CHANGE REQUEST									CR-Form-v5	
*	25.4	413	CR	438	жrev	2	Ж	Current version	ion: <b>3.9.(</b>	) <sup>#</sup>
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Reason for change: # At RAN2 meeting #27, the following regarding security was agreed:

- In case of signalling connections to both domains, the same ciphering algorithm needs to be applied on both domains. The status of ciphering (i.e. started or not started) shall be the same for both domains.
- In case ciphering is started in one CN domain, a subsequently established signalling connection on the other CN domain also needs to be ciphered (with the same ciphering algorithm).

This change takes into account a change that was introduced in 33.102 about two years ago, but which so far has not been reflected in RANAP. This change in 33.102 (subclause 6.4.2) states:

- Change of ciphering and integrity mode (algorithms) at establishment of a second MS to CN connection shall not be permitted. The preferences and special requirements for the ciphering and integrity mode setting shall be common for both domains. (e.g. the order of preference of the algorithms).

The recent change agreed by RAN2 and the text from 33.102 shown above are not in agreement with what today is stated in RANAP. The current text in RANAP is based on the understanding that the ciphering and integrity protection information need not be aligned between the two CNs.

Besides the changes based on what is stated above it also needs to be clarified that since changing of algorithms is not allowed, the only reason for a CN to send a second SECURITY MODE COMMAND message for an existing signalling connection is in order to activate new integrity protection and ciphering keys.

It also needs to be made more clear that the value "no encryption" in the *Encryption Information* IE is not equal to UEA0, but can result in either using UEA0 or in not starting ciphering at all.

Note: How the co-ordination of security information between the two CNs is

	achieved is nowhere described, but is out of the scope of this CR.						
Summary of change: #	The procedure text in RANAP regarding security handling is changed in order be aligned with the above shown statements.						
	Impact assessment towards the previous version of the specification (same release):						
	This CR has isolated impact towards the previous version of the specification (same release).						
	This CR has an impact under functional point of view.						
	The impact can be considered isolated because it only changes the conditions for when to accept a SECURITY MODE COMMAND message.						
Consequences if # not approved:	There will be a misalignment between RANAP and TSes 33.102 and 25.331 regarding security handling. This will lead to erroneous implementations.						
Clauses affected: #	8.7.2, 8.18, 9.2.1.4, 9.3.4						
Other specs #	X Other core specifications						
affected:	Test specifications O&M Specifications						
Other comments: #							

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- 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.

# 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

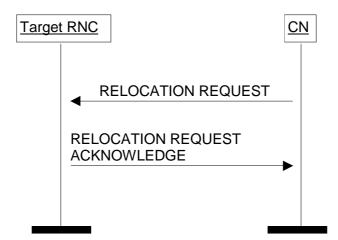


Figure 1: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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  $T_{\text{RELOCalloc.}}$ 

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)

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

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 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.

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.

If the *Integrity Protection Information* IE was included in the RELOCATION REQUEST message, the RNC shall include the *Chosen Integrity Protection Algorithm* IE within the RELOCATION REQUEST ACKNOWLEDGE message, if the *Encryption Information* IE was included, the RNC shall include the *Chosen Encryption Algorithm* IE.

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

If the NAS Synchronisation Indicator IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the RRC Container IE contained in the Target RNC to Source RNC Transparent Container IE.

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

# 8.7.3 Unsuccessful Operation

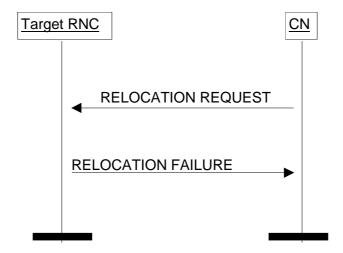


Figure 2: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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  $T_{\text{RELOCalloc}}$  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.

#### **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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container* IE in RELOCATION REQUEST message was received.

# 8.18 Security Mode Control

### 8.18.1 General

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

# 8.18.2 Successful Operation

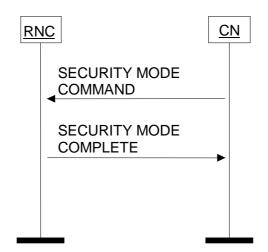


Figure 3: Security Mode Control procedure. Successful operation.

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

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

Upon reception of the SECURITY MODE COMMAND message, the UTRAN shall internally select appropriate algorithms, taking into account the UE/UTRAN capabilities. If a signalling connection already exists towards the other core network domain, and integrity protection and ciphering information has been received from that core network domain, the same algorithm(s) as being used for that core network domain shall be selected. This also means for encryption that if "no encryption" or no Encryption Information IE has been received from the first core network domain and ciphering has not been started, ciphering shall also not be started for the second core network domain. The UTRAN shall then trigger the execution of the corresponding radio interface procedure and, if applicable, start/restartinvoke the encryption device and also start/restart the integrity protection.

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

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

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

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

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

## 8.18.3 Unsuccessful Operation

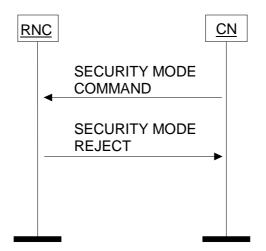


Figure 4: Security Mode Control procedure. Unsuccessful operation.

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

#### 8.18.4 Abnormal Conditions

A SECURITY MODE REJECT message shall be returned if a CN requests a change of ciphering and/or integrity protection algorithms for a UE when ciphering or integrity protection is already active for that CN and such a change of algorithms is not supported by UTRAN and/or the UE. A cause value shall be set to "Change of Ciphering and/or Integrity Protection is not Supported".

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

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

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

# 9.2.1.4 Cause

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Radio Network Layer Cause			INTEGER (RAB pre- empted(1),	Value range is 1 – 64.
			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 Change of Ciphering and/or Integrity Protection is not supported(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),	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Invalid RAB Parameters Value(19),	
			Requested Maximum Bit Rate not Available(20),	
			Requested Maximum Bit Rate for DL not Available(33),	
			Requested Maximum Bit Rate for UL not Available(34),	
			Requested Guaranteed Bit Rate not Available(21),	
			Requested Guaranteed Bit Rate for DL not Available(35),	
			Requested Guaranteed Bit Rate for UL not Available(36),	
			Requested Transfer Delay not Achievable(22),	
			Invalid RAB Parameters Combination(23),	
			Condition Violation for SDU Parameters(24),	
			Condition Violation for Traffic Handling Priority(25),	
			Condition Violation for Guaranteed Bit Rate(26),	
			User Plane Versions not Supported(27),	
			lu UP Failure(28),	
			TRELOCalloc Expiry (7),	
			Relocation Failure in Target CN/RNC or Target System	

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Transport Layer Cause			INTEGER (	Value range is 65 – 80.
			Signalling	
			Transport	
			Resource	
			Failure(65),	
			lu Transport	
			Connection Failed	
			to Establish(66),	
>NAS Cause			) INTEGER	Value range is 81 – 96.
			(User Restriction	3
			Start	
			Indication(81),	
			User Restriction	
			End	
			Indication(82),	
			Normal	
			Release(83),	
			)	
>Protocol Cause			INTEGER	Value range is 97 – 112.
			(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),	
			)	
>Miscellaneous Cause			INTEGER	Value range is 113 – 128.
			(O&M Intervention(113),	
			No Resource	
			Available(114),	
			Unspecified	
			Failure(115),	
			Network	
			Optimisation(116),	
			)	
>Non-standard Cause			INTEGER	Value range is 129 – 256.
				_

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			()	

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	The action was not performed due to that the requested
Integrity protection and/or Ciphering	security mode configuration was in conflict with the already
informationChange Of Ciphering	existing security mode configuration. The UTRAN and/or the
And/Or Integrity Protection Is Not Supported	UE are/is unable to support the requested change of ciphering and/or integrity protection algorithms.
Condition Violation For Guaranteed	The action was not performed due to condition violation for
Bit Rate	guaranteed bit rate.
Condition Violation For SDU	The action was not performed due to condition violation for
Parameters	SDU parameters.
Condition Violation For Traffic	The action was not performed due to condition violation for
Handling Priority	traffic handling priority. The reason for action is Directed Retry
Directed Retry Failure In The Radio Interface	Radio interface procedure has failed.
Procedure	radio interidoe procedure rias failed.
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	The action failed due to invalid RAB parameters combination.
Combination Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Invalid RAB parameters value.  The action failed due to lu 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	Release requested due to UE generated signalling connection
Signalling Connection Release  Release Due To UTRAN Generated	release.  Release is initiated due to UTRAN generated reason.
Reason	Nelease is illitiated due to OTIVAIN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio	The reason for requesting relocation is radio related.
Reasons	
Relocation Failure In Target	Relocation failed due to a failure in target CN/RNC or target
CN/RNC Or Target System  Relocation Not Supported In Target	system.  Relocation failed because relocation was not supported in
RNC Or Target System	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
Requested Ciphering And/Or	same RAB.  The UTRAN or the UE is unable to support the requested
Integrity Protection Algorithms Not	ciphering and/or integrity protection algorithms.
Supported	opnomig and of integrity protestion digentime.
Requested Guaranteed Bit Rate For	The action failed because requested guaranteed bit rate for
DL Not Available	DL is not available.
Requested Guaranteed Bit Rate For	The action failed because requested guaranteed bit rate for
UL Not Available Requested Guaranteed Bit Rate Not	UL is not available.  The action failed because requested guaranteed bit rate is not
Available	available.
Requested Information Not	The action failed because requested information is not
Available	available.
Requested Maximum Bit Rate For	The action failed because requested maximum bit rate for DL
DL Not Available	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	The RNC is not supporting the requested location request
Supported	type either because it doesn't support the requested event or
Democrated Traffic Ol Ni	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	The action failed because requested transfer delay is not
Achievable	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>QUEUING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUING</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 Treloccomplete.
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	RAB failed to establish during relocation because it cannot be
Relocation	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	The action failed because the lu Transport Network Layer
Establish	connection could not be established.
Signalling Transport Resource	Signalling transport resources have failed (e.g. processor
Failure	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	The received message included an abstract syntax error and
Notify)	the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely	The received message contained IEs or IE groups in wrong
Constructed Message)	order or with too many occurrences.
Message Not Compatible With	The received message was not compatible with the receiver
Receiver State	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.

#### 3GPP TS 25.413 V3.9.0 (2002-03)

### 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,
   maxNrOfSeparateTrafficDirections,
   maxRAB-Subflows,
   maxRAB-SubflowCombination,
    maxNrOfLevels,
    id-MessageStructure,
   id-TypeOfError
FROM RANAP-Constants
   Criticality,
   ProcedureCode,
   ProtocolIE-ID,
   TriggeringMessage
FROM RANAP-CommonDataTypes
   ProtocolExtensionContainer{},
   RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;
-- A
AllocationOrRetentionPriority ::= SEQUENCE {
   priorityLevel
                         PriorityLevel,
   pre-emptionCapability
                             Pre-emptionCapability,
                             Pre-emptionVulnerability,
   pre-emptionVulnerability
   queuingAllowed
                          QueuingAllowed,
   iE-Extensions
                          ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
```

```
AllocationOrRetentionPriority-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
AreaIdentity ::= CHOICE {
    sAI
                    SAI,
    geographicalArea
                            GeographicalArea,
-- B
BindingID
                        ::= OCTET STRING (SIZE (4))
-- C
Cause ::= CHOICE {
    radioNetwork
                            CauseRadioNetwork,
    transmissionNetwork
                            CauseTransmissionNetwork,
    nAS
                    CauseNAS,
    protocol
                        CauseProtocol,
    misc
                        CauseMisc,
    non-Standard
                            CauseNon-Standard,
CauseMisc ::= INTEGER {
    om-intervention (113),
    no-resource-available (114),
    unspecified-failure (115),
    network-optimisation (116)
} (113..128)
CauseNAS ::= INTEGER {
    user-restriction-start-indication (81),
    user-restriction-end-indication (82),
    normal-release (83)
} (81..96)
CauseProtocol ::= INTEGER
    transfer-syntax-error (97),
    semantic-error (98),
    message-not-compatible-with-receiver-state (99),
    abstract-syntax-error-reject (100),
    abstract-syntax-error-ignore-and-notify (101),
    abstract-syntax-error-falsely-constructed-message (102)
} (97..112)
CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
```

```
trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    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 change-of-ciphering-and-or-integrity-protection-is-not-
supported (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-quaranteed-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-quaranteed-bit-rate-for-dl-not-available (35),
    requested-quaranteed-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)
} (1..64)
CauseNon-Standard ::= INTEGER (129..256)
CauseTransmissionNetwork ::= INTEGER {
    signalling-transport-resource-failure (65),
    iu-transport-connection-failed-to-establish (66)
```

} (65..80)

\*\*\*\* LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED \*\*\*\*

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, Korea, May 13<sup>th</sup> – 17<sup>th</sup>, 2002

	CHANGE REQUEST							CR-Form-v5			
H	25	.413	CR	439	жrev	2	¥	Current vers	ion: <b>4.</b> 4	1.0	¥
For <mark>H</mark>	ELP on	using this fo	rm, see bo	ottom of th	nis page or	look	at the	pop-up text	over the 🖁	€syn	nbols.
Proposed	d change	affects: #	(U)SIN	1 M	E/UE	Radi	io Ac	cess Network	X Co	re Ne	twork X
Title:	3	& Erroneou	s Security	Mode Co	ntrol proce	edure					
Source:	9	R-WG3									
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Category	<i>:</i> 3	A (con B (add C (fun	rection) responds t dition of fea ctional mo torial modi planations	o a correcti ature), dification of fication) of the abov	ion in an ea f feature)		elease	9) R96 R97 R98 R99 REL-4		se 2) (996) (997) (998) (1999)	ases:

Reason for change: # At RAN2 meeting #27, the following regarding security was agreed:

- In case of signalling connections to both domains, the same ciphering algorithm needs to be applied on both domains. The status of ciphering (i.e. started or not started) shall be the same for both domains.
- In case ciphering is started in one CN domain, a subsequently established signalling connection on the other CN domain also needs to be ciphered (with the same ciphering algorithm).

This change takes into account a change that was introduced in 33.102 about two years ago, but which so far has not been reflected in RANAP. This change in 33.102 (subclause 6.4.2) states:

- Change of ciphering and integrity mode (algorithms) at establishment of a second MS to CN connection shall not be permitted. The preferences and special requirements for the ciphering and integrity mode setting shall be common for both domains. (e.g. the order of preference of the algorithms).

The recent change agreed by RAN2 and the text from 33.102 shown above are not in agreement with what today is stated in RANAP. The current text in RANAP is based on the understanding that the ciphering and integrity protection information need not be aligned between the two CNs.

Besides the changes based on what is stated above it also needs to be clarified that since changing of algorithms is not allowed, the only reason for a CN to send a second SECURITY MODE COMMAND message for an existing signalling connection is in order to activate new integrity protection and ciphering keys.

It also needs to be made more clear that the value "no encryption" in the *Encryption Information* IE is not equal to UEA0, but can result in either using UEA0 or in not starting ciphering at all.

Note: How the co-ordination of security information between the two CNs is

	achieved is nowhere described, but is out of the scope of this CR.					
Summary of change: ₩	The procedure text in RANAP regarding security handling is changed in order to be aligned with the above shown statements.					
	Impact assessment towards the previous version of the specification (same release):					
	This CR has isolated impact towards the previous version of the specification (same release).					
	This CR has an impact under functional point of view.					
	The impact can be considered isolated because it only changes the conditions for when to accept a SECURITY MODE COMMAND message.					
Consequences if # not approved:	There will be a misalignment between RANAP and TSes 33.102 and 25.331 regarding security handling. This will lead to erroneous implementations.					
•	, ,					
Clauses affected: 第	8.7.2, 8.18, 9.2.1.4, 9.3.4					
Other specs #	X Other core specifications # 25.413 V3.9.0 CR438					
	25.413 V5.0.0 CR440					
affected:	Test specifications O&M Specifications					
Other comments: #						

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

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

- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

## 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

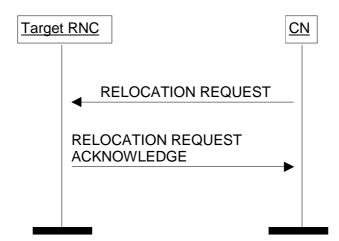


Figure 1: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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  $T_{\text{RELOCalloc.}}$ 

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

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

The RELOCATION REQUEST message shall contain 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)

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

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

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

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

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

If the *NAS Synchronisation Indicator* IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the *RRC Container* IE contained in the *Target RNC to Source RNC Transparent Container* IE.

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

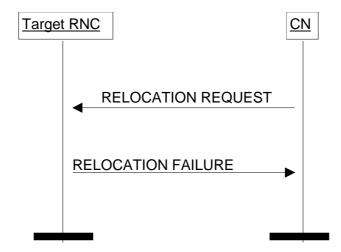


Figure 2: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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.

#### 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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.

- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container* IE in RELOCATION REQUEST message was received.

# 8.18 Security Mode Control

### 8.18.1 General

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

# 8.18.2 Successful Operation

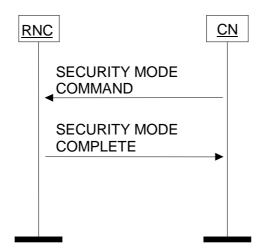


Figure 3: Security Mode Control procedure. Successful operation.

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

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

Upon reception of the SECURITY MODE COMMAND message, the UTRAN shall internally select appropriate algorithms, taking into account the UE/UTRAN capabilities. If a signalling connection already exists towards the other core network domain, and integrity protection and ciphering information has been received from that core network domain, the same algorithm(s) as being used for that core network domain shall be selected. This also means for encryption that if "no encryption" or no Encryption Information IE has been received from the first core network domain and ciphering has not been started, ciphering shall also not be started for the second core network domain. The UTRAN shall then trigger the execution of the corresponding radio interface procedure and, if applicable, start/restartinvoke the encryption device and also start/restart the integrity protection.

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

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

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

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

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

# 8.18.3 Unsuccessful Operation

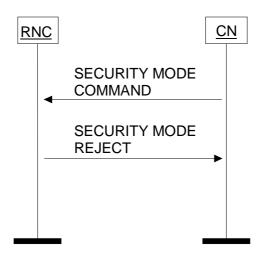


Figure 4: Security Mode Control procedure. Unsuccessful operation.

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

### 8.18.4 Abnormal Conditions

A SECURITY MODE REJECT message shall be returned if a CN requests a change of ciphering and/or integrity protection algorithms for a UE when ciphering or integrity protection is already active for that CN and such a change of algorithms is not supported by UTRAN and/or the UE. A cause value shall be set to "Change of Ciphering and/or Integrity Protection is not Supported".

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

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

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

# 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		Range	IE type and reference	Semantics description
Choice Cause				
>Radio Network Layer Cause			INTEGER (RAB pre- empted(1),	Value range is 1 – 64.
			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 Change of Ciphering and/or Integrity Protection is not supported (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),	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Invalid RAB Parameters Value(19),	
			Requested Maximum Bit Rate not Available(20),	
			Requested Maximum Bit Rate for DL not Available(33),	
			Requested Maximum Bit Rate for UL not Available(34),	
			Requested Guaranteed Bit Rate not Available(21),	
			Requested Guaranteed Bit Rate for DL not Available(35),	
			Requested Guaranteed Bit Rate for UL not Available(36),	
			Requested Transfer Delay not Achievable(22),	
			Invalid RAB Parameters Combination(23),	
			Condition Violation for SDU Parameters(24),	
			Condition Violation for Traffic Handling Priority(25),	
			Condition Violation for Guaranteed Bit Rate(26),	
			User Plane Versions not Supported(27),	
			lu UP Failure(28),	
			TRELOCalloc Expiry (7),	
			Relocation Failure in Target CN/RNC or Target System	

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			not allowed(50))	

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IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Transport Layer Cause			INTEGER (	Value range is 65 – 80.
			Signalling	
			Transport	
			Resource	
			Failure(65),	
			lu Transport	
			Connection Failed	
			to Establish(66),	
>NAS Cause			) INTEGER	Value range is 81 – 96.
>1V/10 Gadae			(User Restriction	value range is on so.
			Start	
			Indication(81),	
			User Restriction	
			End	
			Indication(82),	
			Normal	
			Release(83),	
			)	
>Protocol Cause			INTEGER	Value range is 97 – 112.
			(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),	
			)	N. 1
>Miscellaneous Cause			INTEGER	Value range is 113 – 128.
			(O&M Intervention(113),	
			microcinion(113),	
			No Resource	
			Available(114),	
			Unspecified	
			Failure(115),	
			Network	
			Optimisation(116),	
>Non-standard Cause			) INTEGER	Value range is 129 – 256.
				3

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			()	

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  The action failed because RNC is not able to provide
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing	The action was not performed due to that the requested
Integrity protection and/or Ciphering	security mode configuration was in conflict with the already
informationChange Of Ciphering	existing security mode configuration. The UTRAN and/or the
And/Or Integrity Protection Is Not	UE are/is unable to support the requested change of ciphering
Supported	and/or integrity protection algorithms.
Condition Violation For Guaranteed	The action was not performed due to condition violation for
Bit Rate	guaranteed bit rate.
Condition Violation For SDU	The action was not performed due to condition violation for
Parameters	SDU parameters.
Condition Violation For Traffic	The action was not performed due to condition violation for
Handling Priority	traffic handling priority.
Dedicated Assistance data Not	The action failed because RNC is not able to successfully
Available	deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface	Radio interface procedure has failed.
Procedure	·
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	The action failed due to invalid RAB parameters combination.
Combination	The action railed due to invalid IVAD parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
lu UP Failure	The action failed due to invalid NAB parameters value.  The action failed due to lu UP failure.
14. 41. 144	
No remaining RAB RAB Pre-empted	The reason for the action is no remaining RAB.  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	Release is initiated due to UTRAN generated reason.
Reason	
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio	The reason for requesting relocation is radio related.
Reasons	
Relocation Failure In Target	Relocation failed due to a failure in target CN/RNC or target
CN/RNC Or Target System	system.
Relocation Not Supported In Target	Relocation failed because relocation was not supported in
RNC Or Target System	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
in the state of th	checking.
Request Superseded	The action failed because there was a second request on the
1	same RAB.
Requested Ciphering And/Or	The UTRAN or the UE is unable to support the requested
Integrity Protection Algorithms Not	ciphering and/or integrity protection algorithms.
Supported Suprented Bit Bate For	The action failed because requested guaranteed hit rate for
Requested Guaranteed Bit Rate For	The action failed because requested guaranteed bit rate for
DL Not Available	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	The action failed because requested guaranteed bit rate is not
Available	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	The action failed because requested maximum bit rate for UL
UL Not Available	is not available.
Requested Maximum Bit Rate Not Available	The action failed because requested maximum bit rate is not available.
Requested Request Type Not	The RNC is not supporting the requested location request

	it doesn't support the requested report area.
Requested Traffic Class Not	The action failed because requested traffic class is not
Available	available.
Requested Transfer Delay Not	The action failed because requested transfer delay is not
Achievable	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>QUEUING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUING</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	RAB failed to establish during relocation because it cannot be
Relocation	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 RAB Parameters IE.

Transport Layer cause	Meaning
Iu Transport Connection Failed to	The action failed because the lu Transport Network Layer
Establish	connection could not be established.
Signalling Transport Resource	Signalling transport resources have failed (e.g. processor
Failure	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	The received message included an abstract syntax error and
Notify)	the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely	The received message contained IEs or IE groups in wrong
Constructed Message)	order or with too many occurrences.
Message Not Compatible With	The received message was not compatible with the receiver
Receiver State	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.

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### 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,
   maxNrOfSeparateTrafficDirections,
   maxRAB-Subflows,
   maxRAB-SubflowCombination,
   maxNrOfLevels,
   maxNrOfAltValues,
    id-MessageStructure,
   id-TypeOfError
FROM RANAP-Constants
   Criticality,
   ProcedureCode,
   ProtocolIE-ID,
   TriggeringMessage
FROM RANAP-CommonDataTypes
    ProtocolExtensionContainer{},
   RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;
-- A
AllocationOrRetentionPriority ::= SEQUENCE {
   priorityLevel
                          PriorityLevel,
                             Pre-emptionCapability,
   pre-emptionCapability
   pre-emptionVulnerability
                             Pre-emptionVulnerability,
   queuingAllowed
                          QueuingAllowed,
   iE-Extensions
                          ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
    . . .
```

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```
AllocationOrRetentionPriority-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Alt-RAB-Parameters ::= SEQUENCE {
    altMaxBitrateInf
                               Alt-RAB-Parameter-MaxBitrateInf
                                                                                        OPTIONAL.
    altGuaranteedBitRateInf
                               Alt-RAB-Parameter-GuaranteedBitrateInf
                                                                                        OPTIONAL,
    iE-Extensions
                           ProtocolExtensionContainer { {Alt-RAB-Parameters-ExtIEs} } OPTIONAL,
Alt-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
    altGuaranteedBitrateType
                                     Alt-RAB-Parameter-GuaranteedBitrateType,
    altGuaranteedBitrates
                                       Alt-RAB-Parameter-GuaranteedBitrates
                                                                                        OPTIONAL
    -- This IE shall be present if the Type of Guaranteed Bit Rates Information IE is set to "Value range" or "Discrete values" --,
Alt-RAB-Parameter-GuaranteedBitrateType ::= ENUMERATED{
    unspecified,
    value-range,
    discrete-values,
Alt-RAB-Parameter-GuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-GuaranteedBitrateList
Alt-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
Alt-RAB-Parameter-MaxBitrateInf ::= SEQUENCE {
    altMaxBitrateType
                               Alt-RAB-Parameter-MaxBitrateType,
    altMaxBitrates
                               Alt-RAB-Parameter-MaxBitrates
                                                                        OPTIONAL
    -- This IE shall be present if the Type of Alternative Maximun Bit Rates Information IE is set to "Value range" or "Discrete values" --,
Alt-RAB-Parameter-MaxBitrateType ::= ENUMERATED{
    unspecified,
    value-range,
    discrete-values,
Alt-RAB-Parameter-MaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
```

Alt-RAB-Parameter-MaxBitrateList

```
169
```

Alt-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate AreaIdentity ::= CHOICE { geographicalArea GeographicalArea, Ass-RAB-Parameters ::= SEQUENCE { assMaxBitrateInf Ass-RAB-Parameter-MaxBitrateList OPTIONAL, Ass-RAB-Parameter-GuaranteedBitrateList assGuaranteedBitRateInf OPTIONAL, iE-Extensions ProtocolExtensionContainer { {Ass-RAB-Parameters-ExtIEs} } OPTIONAL, . . . Ass-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= { Ass-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate Ass-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate -- B BindingID ::= OCTET STRING (SIZE (4)) BroadcastAssistanceDataDecipheringKeys ::= SEQUENCE { cipheringKeyFlag BIT STRING (SIZE (1)), currentDecipheringKey BIT STRING (SIZE (56)), BIT STRING (SIZE (56)), nextDecipheringKey Cause ::= CHOICE { radioNetwork CauseRadioNetwork, transmissionNetwork CauseTransmissionNetwork, nAS CauseNAS, CauseProtocol, protocol CauseMisc. non-Standard CauseNon-Standard,

```
CauseMisc ::= INTEGER {
    om-intervention (113),
    no-resource-available (114),
    unspecified-failure (115),
    network-optimisation (116)
} (113..128)
CauseNAS ::= INTEGER {
    user-restriction-start-indication (81),
    user-restriction-end-indication (82),
    normal-release (83)
} (81..96)
CauseProtocol ::= INTEGER {
    transfer-syntax-error (97),
    semantic-error (98),
    message-not-compatible-with-receiver-state (99),
    abstract-syntax-error-reject (100),
    abstract-syntax-error-ignore-and-notify (101),
    abstract-syntax-error-falsely-constructed-message (102)
} (97..112)
CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    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 change-of-ciphering-and-or-integrity-protection-is-not-
supported (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-quaranteed-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-quaranteed-bit-rate-for-dl-not-available (35),
    requested-quaranteed-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)
} (1..64)
CauseNon-Standard ::= INTEGER (129..256)
CauseTransmissionNetwork ::= INTEGER {
    signalling-transport-resource-failure (65),
    iu-transport-connection-failed-to-establish (66)
} (65..80)
```

\*\*\*\* LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED \*\*\*\*

	CHANGE REQUEST							CR-Form-v5	
¥ 2	25.413	CR	440	жrev	2	Ж	Current vers	ion: <b>5.0.</b> (	) H
For <u>HELP</u> of	n using this for	m, see bo	ttom of this	s page or	look	at th	e pop-up text	over the 光 s	symbols.
Proposed chang	ge affects: #	(U)SIM	ME	/UE	Radi	io Ac	cess Network	X Core I	Network X
Title:	器 Erroneou	s Security	Mode Con	trol proce	edure				
Source:	₩ R-WG3								
Work item code	e:						Date: ♯	2002-05-30	)
Category:	## A Use one of the following categories:  ## A Use one of the following categories:  ## Correction Use one of the following releases:  ## Correction Use one of the following releases:  ## Correction In an earlier release Of the following releases:  ## Corresponds to a correction in an earlier release Of Release 1996 (Release 1996)  ## Correction In an earlier release Of Release 1997 (Release 1997)  ## Correction In an earlier release Of Release 1997 (Release 1998)  ## Does to the following releases:  ## Correction In an earlier release Of Release 1996 (Release 1997)  ## Correction In an earlier release Of Release 1997 (Release 1998)  ## Does to the following releases:  ## Correction In an earlier release Of Release 1996 (Release 1997)  ## Correction In an earlier release Of Release 1997 (Release 1998)  ## Does to the following releases:  ## Correction In an earlier release Of Release 1996 (Release 1998)  ## Does to the following releases:  ## Correction In an earlier release Of Release 1996 (Release 1998)  ## Does to the following releases:  ## Correction In an earlier release Of Release 1996 (Release 1998)  ## Does to the following releases:  ## Does to the foll						2) 6) 7) 8)		

Reason for change: # At RAN2 meeting #27, the following regarding security was agreed:

- In case of signalling connections to both domains, the same ciphering algorithm needs to be applied on both domains. The status of ciphering (i.e. started or not started) shall be the same for both domains.
- In case ciphering is started in one CN domain, a subsequently established signalling connection on the other CN domain also needs to be ciphered (with the same ciphering algorithm).

This change takes into account a change that was introduced in 33.102 about two years ago, but which so far has not been reflected in RANAP. This change in 33.102 (subclause 6.4.2) states:

- Change of ciphering and integrity mode (algorithms) at establishment of a second MS to CN connection shall not be permitted. The preferences and special requirements for the ciphering and integrity mode setting shall be common for both domains. (e.g. the order of preference of the algorithms).

The recent change agreed by RAN2 and the text from 33.102 shown above are not in agreement with what today is stated in RANAP. The current text in RANAP is based on the understanding that the ciphering and integrity protection information need not be aligned between the two CNs.

Besides the changes based on what is stated above it also needs to be clarified that since changing of algorithms is not allowed, the only reason for a CN to send a second SECURITY MODE COMMAND message for an existing signalling connection is in order to activate new integrity protection and ciphering keys.

It also needs to be made more clear that the value "no encryption" in the *Encryption Information* IE is not equal to UEA0, but can result in either using UEA0 or in not starting ciphering at all.

Note: How the co-ordination of security information between the two CNs is

	achieved is nowhere described, but is out of the scope of this CR.
Summary of change: #	The procedure text in RANAP regarding security handling is changed in order to be aligned with the above shown statements.
	Impact assessment towards the previous version of the specification (same release):
	This CR has isolated impact towards the previous version of the specification (same release).
	This CR has an impact under functional point of view.
	The impact can be considered isolated because it only changes the conditions for when to accept a SECURITY MODE COMMAND message.
Consequences if	There will be a misalignment between RANAP and TSes 33.102 and 25.331 regarding security handling. This will lead to erroneous implementations.

Clauses affected:	第 8.7.2, 8.18, 9.2.1.4, 9.3.4
Other specs	<b>X</b> Other core specifications <b>X</b> 25.413 V3.9.0 CR438 25.413 V4.4.0 CR439
affected:	Test specifications O&M Specifications
Other comments:	<b>x</b>

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

Comprehensive information and tips about how to create CRs can be found at: <a href="http://www.3gpp.org/3G">http://www.3gpp.org/3G</a> Specs/CRs.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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

# 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

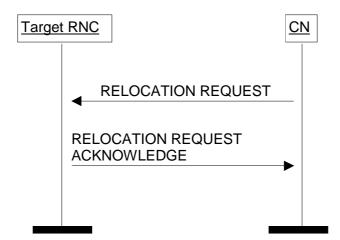


Figure 1: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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  $T_{\text{RELOCalloc.}}$ 

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

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

The RELOCATION REQUEST message shall contain 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)

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

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

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

The *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)

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 by 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.

If the *Integrity Protection Information* IE was included in the RELOCATION REQUEST message, the RNC shall include the *Chosen Integrity Protection Algorithm* IE within the RELOCATION REQUEST ACKNOWLEDGE message, if the *Encryption Information* IE was included, the RNC shall include the *Chosen Encryption Algorithm* IE.

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

If the NAS Synchronisation Indicator IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the RRC Container IE contained in the Target RNC to Source RNC Transparent Container IE.

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

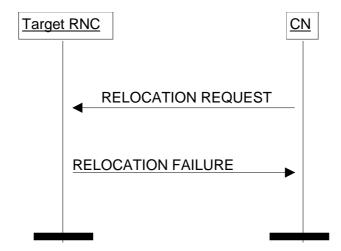


Figure 2: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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

#### 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.

#### **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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container* IE in RELOCATION REQUEST message was received.

# 8.18 Security Mode Control

#### 8.18.1 General

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

## 8.18.2 Successful Operation

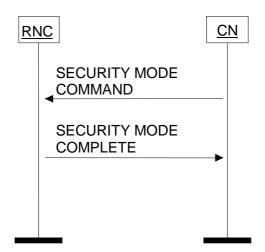


Figure 3: Security Mode Control procedure. Successful operation.

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

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

Upon reception of the SECURITY MODE COMMAND message, the UTRAN shall internally select appropriate algorithms, taking into account the UE/UTRAN capabilities. If a signalling connection already exists towards the other core network domain, and integrity protection and ciphering information has been received from that core network domain, the same algorithm(s) as being used for that core network domain shall be selected. This also means for encryption that if "no encryption" or no Encryption Information IE has been received from the first core network domain and ciphering has not been started, ciphering shall also not be started for the second core network domain. The UTRAN shall then trigger the execution of the corresponding radio interface procedure and, if applicable, start/restartinvoke the encryption device and also start/restart the integrity protection.

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

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

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

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

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

## 8.18.3 Unsuccessful Operation

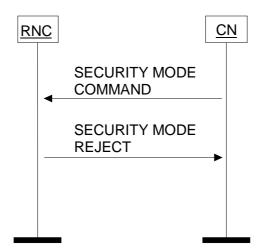


Figure 4: Security Mode Control procedure. Unsuccessful operation.

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

#### 8.18.4 Abnormal Conditions

A SECURITY MODE REJECT message shall be returned if a CN requests a change of ciphering and/or integrity protection algorithms for a UE when ciphering or integrity protection is already active for that CN and such a change of algorithms is not supported by UTRAN and/or the UE. A cause value shall be set to "Change of Ciphering and/or Integrity Protection is not Supported".

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

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

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

## 9.2.1.4 Cause

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Radio Network Layer Cause			INTEGER (RAB pre- empted(1),	Value range is 1 – 64.
			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 Change of Ciphering and/or Integrity Protection is not supported (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),	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Invalid RAB Parameters Value(19),	
			Requested Maximum Bit Rate not Available(20),	
			Requested Maximum Bit Rate for DL not Available(33),	
			Requested Maximum Bit Rate for UL not Available(34),	
			Requested Guaranteed Bit Rate not Available(21),	
			Requested Guaranteed Bit Rate for DL not Available(35),	
			Requested Guaranteed Bit Rate for UL not Available(36),	
			Requested Transfer Delay not Achievable(22),	
			Invalid RAB Parameters Combination(23),	
			Condition Violation for SDU Parameters(24),	
			Condition Violation for Traffic Handling Priority(25),	
			Condition Violation for Guaranteed Bit Rate(26),	
			User Plane Versions not Supported(27),	
			lu UP Failure(28),	
			TRELOCalloc Expiry (7),	
			Relocation Failure in Target CN/RNC or Target System	

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			not allowed(50),	
			Reduce Load in Serving Cell (51),	
			No Radio Resources Available in Target cell (52))	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
>Transport Layer Cause			INTEGER	Value range is 65 – 80.
			(	
			Signalling	
			Transport	
			Resource	
			Failure(65),	
			lu Transport	
			Connection Failed	
			to Establish(66),	
			)	
>NAS Cause			INTEGER	Value range is 81 – 96.
			(User Restriction	
			Start	
			Indication(81),	
			J. 5	
			User Restriction	
			End	
			Indication(82),	
			Normal	
			Release(83),	
			11010000(00),	
			)	
>Protocol Cause			INTEGER	Value range is 97 – 112.
			(Transfer Syntax	
			Error(97),	
			Semantic Error	
			(98),	
			Magazara not	
			Message not compatible with	
			receiver state	
			(99),	
			(33),	
			Abstract Syntax	
			Error (Reject)	
			(100),	
			Abstract Syntax	
			Error (Ignore and	
			Notify) (101),	
			Abstract Syntax	
			Error (Falsely	
			Constructed	
			Message) (102),	
			/ ( · • - / )	
			)	
>Miscellaneous Cause			INTEGER	Value range is 113 – 128.
			(O&M	
			Intervention(113),	
			No Deserves	
			No Resource	
			Available(114),	
			Unspecified	
			Failure(115),	
			Network	
			Optimisation(116),	
>Non-standard Cause			) INTEGER	Value range is 129 – 256.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			()	

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
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing	The action was not performed due to that the requested
Integrity protection and/or Ciphering	security mode configuration was in conflict with the already
informationChange Of Ciphering	existing security mode configuration. The UTRAN and/or the
And/Or Integrity Protection Is Not	UE are/is unable to support the requested change of ciphering
Supported	and/or integrity protection algorithms.
Condition Violation For Guaranteed	The action was not performed due to condition violation for
Bit Rate Condition Violation For SDU	guaranteed bit rate.  The action was not performed due to condition violation for
Parameters	SDU parameters.
Condition Violation For Traffic	The action was not performed due to condition violation for
Handling Priority	traffic handling priority.
Dedicated Assistance data Not	The action failed because RNC is not able to successfully
Available	deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface	Radio interface procedure has failed.
Procedure	
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	The action failed due to invalid RAB parameters combination.
Combination	
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
lu UP Failure	The action failed due to lu 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	Release requested due to UE generated signalling connection
Signalling Connection Release	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	The UTRAN or the UE is unable to support the requested
Integrity Protection Algorithms Not Supported	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	The action failed because requested guaranteed bit rate for
UL Not Available	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	The RNC is not supporting the requested location request
Supported	type either because it doesn't support the requested event or

it doesn't support the requested report area.  The action failed because requested traffic class is not available.  Requested Transfer Delay Not Achievable Resource Optimisation Relocation Successful Relocation The reason for requesting relocation is resource optimisation.  Time Critical Relocation The reason for the action is completion of successful relocation.  Time Critical Relocation Relocation is requested for time critical reason.  Toueuing Expiry The action failed due to expiry of the timer Toueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer Trelocation for the action is expiry of the timer Trelocation.  Trelocomplete Expiry The reason for the action is expiry of timer Trelocomplete.  Trelocomplete Expiry The reason for the action is expiry of timer Trelocomplete.  Trelocomplete Expiry Relocation Preparation procedure is cancelled when timer Trelocomplete expires.  Relocation Preparation procedure is cancelled when timer Trelocomplete in the target RNC.  Unable To Establish During Relocation 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 RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell is too high.		
Available Requested Transfer Delay 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. Toueung Expiry The action failed due to expiry of the timer Toueung.  Relocation Resource Allocation procedure failed due to expiry of the timer Trelocation for the action is expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation 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.  The action failed because requested user plane versions were not supported.  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell needs to be reduced.		it doesn't support the requested report area.
Requested Transfer Delay Not Achievable  Resource Optimisation Relocation  Successful Relocation  The reason for requesting relocation is resource optimisation.  The reason for the action is completion of successful relocation.  Time Critical Relocation  Time Critical Relocation  Relocation is requested for time critical reason.  Toueuing Expiry  The action failed due to expiry of the timer Toueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer Trelocomplete Expiry  The reason for the action is expiry of timer Trelocomplete.  Trelocomplete Expiry  The reason for the action is expiry of timer Trelocomplete.  Trelocomplete Expiry  The reason for the action is expiry of timer Trelocomplete.  Trelocomplete Expiry  Relocation Preparation procedure is cancelled when timer Trelocomplete is cancelled when timer Trelocomplete.  Unable To Establish During  Relocation rejected because the target RNC is not known to the CN.  The action is requested due to user inactivity.  The action failed because requested user plane versions were not supported.  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.	Requested Traffic Class Not	The action failed because requested traffic class 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. Toueuing Expiry The action failed due to expiry of the timer Toueuing. Relocation Resource Allocation procedure failed due to expiry of the timer Trelocation for the action is expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation for the action is expiry of timer Trelocation for the action is expiry of timer Trelocation. Trelocopred Expiry The reason for the action is expiry of timer Trelocation. Trelocopred Expiry Relocation Preparation procedure is cancelled when timer Trelocopred expires. 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. The action is requested due to user inactivity. 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 RAB Parameters IE. Reduce Load in Serving Cell Load on serving cell needs to be reduced. Load on target cell is too high.	Available	available.
Resource Optimisation Relocation  The reason for requesting relocation is resource optimisation.  The reason for the action is completion of successful relocation.  Time Critical Relocation  Relocation is requested for time critical reason.  Toueuing Expiry  The action failed due to expiry of the timer Toueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation for the action is expiry of the timer Toueuing failed due to expiry of the timer Trelocation failed due to expiry of the timer T	Requested Transfer Delay Not	The action failed because requested transfer delay is not
Successful Relocation The reason for the action is completion of successful relocation.  Time Critical Relocation Relocation is requested for time critical reason.  Toueuing Expiry The action failed due to expiry of the timer Toueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation procedure failed due to expiry of the timer Trelocation is expiry of timer Trelocation.  Trelocopy Expiry The reason for the action is expiry of timer Trelocopy of timer Trelocopy failed by the reason for the action is expiry of timer Trelocopy failed by the reason for the action is expiry of timer Trelocopy failed by the reason for the action is expiry of timer Trelocopy failed by the reason for the action is expiry of timer Trelocopy failed by the reason for the action is expiry of timer Trelocopy failed by the relocation failed because it cannot be supported in the target RNC.  Unable To Establish During Relocation procedure is cancelled when timer Trelocopy expires.  RAB failed to establish during relocation because it cannot be supported in the target RNC.  Relocation rejected because the target RNC is not known to the CN.  User Inactivity The action is requested due to user inactivity.  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 RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell needs to be reduced.  Load on target cell is too high.	Achievable	achievable.
relocation.  Time Critical Relocation Relocation is requested for time critical reason.  Taueuing Expiry The action failed due to expiry of the timer Taueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer Taelocalloc.  Trelocomplete Expiry The reason for the action is expiry of timer Taelocomplete.  Trelocoverall Expiry The reason for the action is expiry of timer Taelocoverall.  Relocation Preparation procedure is cancelled when timer Taelocoprep Expiry Relocation Preparation procedure is cancelled when timer Taelocoprep expires.  Unable To Establish During Relocation Relocation Relocation 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 RNC unable to establish all RFCs RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell needs to be reduced.  No Radio Resources Available in  Load on target cell is too high.	Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Time Critical Relocation  Relocation is requested for time critical reason.  Tqueuing Expiry  The action failed due to expiry of the timer Tqueuing.  Relocation Resource Allocation procedure failed due to expiry of the timer TRELOCalloc.  TRELOCalloc Expiry  The reason for the action is expiry of timer TRELOCcomplete.  TRELOCoverall Expiry  The reason for the action is expiry of timer TRELOCoverall.  Relocation Preparation procedure is cancelled when timer TRELOCyrep expires.  Unable To Establish During  Relocation Preparation procedure is cancelled when timer TRELOCyrep expires.  Unknown 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  RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Relocation is requested for time critical reason.  The action failed due to expiry of the timer Tqueune failed due to expiry of the timer Tqueune failed because it cannot be supported in the target RNC.  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Load on serving cell needs to be reduced.  Load on target cell is too high.	Successful Relocation	The reason for the action is completion of successful
TQUEUING Expiry The action failed due to expiry of the timer TQUEUING. Relocation Resource Allocation procedure failed due to expiry of the timer TRELOCalloc TRELOCalloc TRELOCamplete Expiry The reason for the action is expiry of timer TRELOComplete. TRELOCoverall Expiry The reason for the action is expiry of timer TRELOCoverall. Relocation Preparation procedure is cancelled when timer TRELOCoverall expiry Relocation Preparation procedure is cancelled when timer TRELOCoverall expiry Relocation Preparation procedure is cancelled when timer TRELOCoverall expires. Unable To Establish During 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 RNC unable to establish all RFCs RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE. Reduce Load in Serving Cell Load on serving cell needs to be reduced. No Radio Resources Available in Load on target cell is too high.		relocation.
Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOComplete</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOComplete</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .  Relocation Preparation procedure is cancelled when timer T <sub>RELOCoprep</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  RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  Load on serving cell needs to be reduced.  No Radio Resources Available in  Load on target cell is too high.	Time Critical Relocation	Relocation is requested for time critical reason.
Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOComplete</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOComplete</sub> .  Trelocomplete Expiry  The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .  Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.  Unable To Establish During  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  RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.	T <sub>QUEUING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUING</sub> .
Trelocomplete Expiry  The reason for the action is expiry of timer Trelocomplete.  Trelocoverall Expiry  The reason for the action is expiry of timer Trelocoverall.  Trelocoverall Expiry  The reason for the action is expiry of timer Trelocoverall.  Relocation Preparation procedure is cancelled when timer Trelocoverall expires.  Unable To Establish During  Relocation  Relocation procedure is cancelled when timer Trelocoverall expires.  Unable To Establish During  Relocation procedure is cancelled when timer Trelocoverall expires.  Relocation procedure is cancelled when timer Trelocoverall expires.  Relocation procedure is cancelled when timer Trelocoverall expires.  Relocation procedure is cancelled when timer Trelocoverall.  Relocation is expiry of timer Trelocoverall.		Relocation Resource Allocation procedure failed due to expiry
Trelocoverall Expiry  The reason for the action is expiry of timer Trelocoverall.  Relocation Preparation procedure is cancelled when timer Trelocoverall 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 RNC unable to establish all RFCs RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell No Radio Resources Available in  Load on target cell is too high.		of the timer T <sub>RELOCalloc</sub> .
TRELOCPIED Expiry  Relocation Preparation procedure is cancelled when timer TRELOCPIED 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  RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.	T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
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 RAB Parameters IE.  Reduce Load in Serving Cell No Radio Resources Available in  Load on target cell is too high.	T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
Unable To Establish During Relocation Relocation 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 RNC unable to establish all RFCs RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE. Reduce Load in Serving Cell No Radio Resources Available in  RAB failed to establish during relocation because it cannot be supported to establish all the target RNC. Relocation rejected because the target RNC is not known to the CN.  Relocation rejected because requested user inactivity. The action failed because requested user plane versions were not supported. RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE. Load on serving cell needs to be reduced. Load on target cell is too high.	T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer
Relocation 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 RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell needs to be reduced.  No Radio Resources Available in Load on target cell is too high.		
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.  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 RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.	Unable To Establish During	RAB failed to establish during relocation because it cannot be
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 RAB Parameters IE.  Reduce Load in Serving Cell No Radio Resources Available in Load on target cell is too high.	Relocation	supported in the target RNC.
User Inactivity  User Plane Versions Not Supported  The action is requested due to user inactivity.  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 RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.	Unknown Target RNC	Relocation rejected because the target RNC is not known to
User Plane Versions Not Supported  RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  No Radio Resources Available in  Load on target cell is too high.		
not supported.  RNC unable to establish all RFCs RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell Load on serving cell needs to be reduced.  No Radio Resources Available in Load on target cell is too high.		
RNC unable to establish all RFCs  RNC couldn't establish all RAB subflow combinations indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  Load on serving cell needs to be reduced.  No Radio Resources Available in  Load on target cell is too high.	User Plane Versions Not Supported	The action failed because requested user plane versions were
indicated within the RAB Parameters IE.  Reduce Load in Serving Cell  Load on serving cell needs to be reduced.  No Radio Resources Available in  Load on target cell is too high.		not supported.
Reduce Load in Serving Cell Load on serving cell needs to be reduced.  No Radio Resources Available in Load on target cell is too high.	RNC unable to establish all RFCs	
No Radio Resources Available in Load on target cell is too high.		
3 3	Reduce Load in Serving Cell	Load on serving cell needs to be reduced.
Target Cell	No Radio Resources Available in	Load on target cell is too high.
	Target Cell	

Transport Layer cause	Meaning
Iu Transport Connection Failed to	The action failed because the lu Transport Network Layer
Establish	connection could not be established.
Signalling Transport Resource	Signalling transport resources have failed (e.g. processor
Failure	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	The received message included an abstract syntax error and
Notify)	the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely	The received message contained IEs or IE groups in wrong
Constructed Message)	order or with too many occurrences.
Message Not Compatible With	The received message was not compatible with the receiver
Receiver State	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.

#### 9.3.4 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,
   maxNrOfSeparateTrafficDirections,
   maxRAB-Subflows,
   maxRAB-SubflowCombination,
   maxNrOfLevels,
   maxNrOfAltValues,
    id-MessageStructure,
   id-TypeOfError
   id-DownlinkCellLoadInformation,
    id-UplinkCellLoadInformation
FROM RANAP-Constants
   Criticality,
   ProcedureCode,
   ProtocolIE-ID,
   TriggeringMessage
FROM RANAP-CommonDataTypes
   ProtocolExtensionContainer{},
   RANAP-PROTOCOL-EXTENSION
FROM RANAP-Containers;
-- A
AllocationOrRetentionPriority ::= SEQUENCE {
   priorityLevel
                         PriorityLevel,
   pre-emptionCapability
                             Pre-emptionCapability,
   pre-emptionVulnerability
                            Pre-emptionVulnerability,
   queuingAllowed
                         OueuingAllowed,
```

```
ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
    iE-Extensions
AllocationOrRetentionPriority-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Alt-RAB-Parameters ::= SEQUENCE {
    altMaxBitrateInf
                               Alt-RAB-Parameter-MaxBitrateInf
                                                                                        OPTIONAL.
    altGuaranteedBitRateInf
                               Alt-RAB-Parameter-GuaranteedBitrateInf
                                                                                        OPTIONAL,
                           ProtocolExtensionContainer { {Alt-RAB-Parameters-ExtIEs} } OPTIONAL,
    iE-Extensions
Alt-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
    altGuaranteedBitrateType
                               Alt-RAB-Parameter-GuaranteedBitrateType,
    altGuaranteedBitrates
                                       Alt-RAB-Parameter-GuaranteedBitrates
    -- This IE shall be present if the Type of Guaranteed Bit Rates Information IE is set to "Value range" or "Discrete values" --,
Alt-RAB-Parameter-GuaranteedBitrateType ::= ENUMERATED{
    unspecified.
    value-range,
    discrete-values,
    . . .
Alt-RAB-Parameter-GuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-GuaranteedBitrateList
Alt-RAB-Parameter-GuaranteedBitrateList ::= SEOUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
Alt-RAB-Parameter-MaxBitrateInf ::= SEQUENCE {
    altMaxBitrateType
                               Alt-RAB-Parameter-MaxBitrateType,
                               Alt-RAB-Parameter-MaxBitrates
                                                                        OPTIONAL
    altMaxBitrates
    -- This IE shall be present if the Type of Alternative Maximun Bit Rates Information IE is set to "Value range" or "Discrete values" --,
    . . .
Alt-RAB-Parameter-MaxBitrateType ::= ENUMERATED{
    unspecified,
    value-range,
    discrete-values,
    . . .
```

```
Alt-RAB-Parameter-MaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
    Alt-RAB-Parameter-MaxBitrateList
Alt-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
AreaIdentity ::= CHOICE {
                    SAI.
    geographicalArea
                            GeographicalArea,
Ass-RAB-Parameters ::= SEOUENCE {
    assMaxBitrateInf
                                Ass-RAB-Parameter-MaxBitrateList
                                                                                         OPTIONAL,
                                Ass-RAB-Parameter-GuaranteedBitrateList
    assGuaranteedBitRateInf
                                                                                        OPTIONAL,
                            ProtocolExtensionContainer { {Ass-RAB-Parameters-ExtIEs} } OPTIONAL,
    iE-Extensions
Ass-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Ass-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
Ass-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
-- B
BindingID
                        ::= OCTET STRING (SIZE (4))
BroadcastAssistanceDataDecipheringKeys ::= SEQUENCE {
    cipheringKeyFlag
                            BIT STRING (SIZE (1)),
    currentDecipheringKey BIT STRING (SIZE (56)),
    nextDecipheringKey
                           BIT STRING (SIZE (56)),
    . . .
-- C
Cause ::= CHOICE {
    radioNetwork
                            CauseRadioNetwork,
    transmissionNetwork
                            CauseTransmissionNetwork,
    nAS
                    CauseNAS,
    protocol
                        CauseProtocol,
    misc
                        CauseMisc.
    non-Standard
                            CauseNon-Standard,
```

```
CauseMisc ::= INTEGER
    om-intervention (113),
    no-resource-available (114),
    unspecified-failure (115),
    network-optimisation (116)
} (113..128)
CauseNAS ::= INTEGER {
    user-restriction-start-indication (81),
    user-restriction-end-indication (82),
    normal-release (83)
} (81..96)
CauseProtocol ::= INTEGER {
    transfer-syntax-error (97),
    semantic-error (98),
    message-not-compatible-with-receiver-state (99),
    abstract-syntax-error-reject (100),
    abstract-syntax-error-ignore-and-notify (101),
    abstract-syntax-error-falsely-constructed-message (102)
} (97..112)
CauseRadioNetwork ::= INTEGER {
    rab-pre-empted (1),
    trelocoverall-expiry (2),
    trelocprep-expiry (3),
    treloccomplete-expiry (4),
    tqueing-expiry (5),
    relocation-triggered (6),
    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 change of ciphering and or integrity protection is not-
supported (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),
```

Release 5

```
condition-violation-for-quaranteed-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-quaranteed-bit-rate-for-dl-not-available (35),
    requested-quaranteed-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),
    reduce-load-in-serving-cell (51),
    no-radio-resources-available-in-target-cell (52)
} (1..64)
CauseNon-Standard ::= INTEGER (129..256)
CauseTransmissionNetwork ::= INTEGER {
    signalling-transport-resource-failure (65),
    iu-transport-connection-failed-to-establish (66)
} (65..80)
```

\*\*\*\* LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED \*\*\*\*

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, Korea, 13th – May17<sup>th</sup>, 2002

R3-021197

CHANGE REQUEST										
*	25.413	CR 441	ж	rev	<b>-</b> #	Current vers	ion: <b>3.9.0</b>	¥		
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>%</b> symbols.										
Proposed c	hange affect	s: ♯ (U)SIM	ME/UI	E	Radio A	ccess Network	K X Core N	etwork X		
Title:	₩ Cor	rection of Target I	RNC-ID							
Source:	₩ R-W	/G3								
Work item c	eode: अ <mark>TEI</mark>					Date: ♯	April 2002			
Category:	ж <mark>F</mark>					Release: ₩	R99			
Reason for	Detail be for <b>change:</b> 第	ne of the following  (essential correct  (corresponds to a  (correspon	ion) a correction ir are), fication of fea ation) the above ca .900.	ture) tegories D is wro	can	2 Re) R96 R97 R98 R99 REL-4 REL-5		) ) ) )		
Summary of	J	Correction of tab Impact assessment This CR has no mp	towards the p	orevious	version o	of the specificat	ion (same relea	<u>se):</u>		
Consequence not approve		Potential miscoc sequence.	ling of the T	arget-R	NC-ID w	rith a choice in	nstead of a pui	re		
Clauses affe	ected: #	9.2.1.25								
Other specs affected:	<b>3 3 3</b>	Other core sp Test specifica O&M Specific	itions	ж		13 CR442 RE 13 CR443 RE				
Other comn	nents: Ж									

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

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

- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 9.2.1.25 Target ID

*Target ID* IE identifies the target for the relocation of SRNS. The target ID may be e.g. Target RNC-ID (for UMTS-UMTS relocation) or Cell Global ID of the relocation target (in case of UMTS to GSM relocation).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Target ID				
>Target RNC-ID				
>>Choice CN Domain				
<del>ID</del>				
>>>CS Domain ID				See ref. [3].
>>>>LAI	M		9.2.3.6	
>>>PS Domain ID				See ref. [3].
>>>>LAI	M		9.2.3.6	
<del>&gt;&gt;&gt;</del> >>RAC	<u>MO</u>		9.2.3.7	
>>RNC-ID	M		INTEGER	
			(04095)	
>CGI				
>>LAI	M		9.2.3.6	
>>CI	M		OCTET STRING (2)	

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, Korea, 13th – May17<sup>th</sup>, 2002

R3-021198

CHANGE REQUEST									
*	25.413	CR	442	₩ rev	<b>-</b> #	Current vers	4.4.0	¥	
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>ૠ</b> symbols.									
Proposed c	hange affec	ets: # (U)	SIM ME	/UE	Radio A	Access Networ	k X Core N	etwork X	
Title:	ж <mark>С</mark> о	rrection of Ta	rget RNC-ID						
Source:	ж <mark>R-\</mark>	WG3							
Work item c	eode: 郑 <mark>TE</mark>	I				Date: ∺	April 2002		
Category:	жA					Release: Ж	REL-4		
Reason for	Deta be fo	F (essential c A (correspond B (Addition of C (Functional D (Editorial m ailed explanatio bund in 3GPP	ds to a correction feature), modification of odification) and of the above R 21.900.	feature) categorie	es can	2		) ) ) )	
Summary of	f change:	Impact assess	ment towards tl	ne previou	s version	e ASN.1 descr of the specificat format with the	tion (same relea	<u>se):</u>	
Consequent not approve		Potential m sequence.	iscoding of the	e Target-	RNC-ID	with a choice ir	nstead of a pu	re	
Clauses affe	ected: 第	9.2.1.25							
Other specs affected:	<b>3</b> %	Test spe	re specificatio cifications ecifications	ns }		113 CR441 R9 113 CR443 RE			
Other comn	nents: #								

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

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- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 9.2.1.25 Target ID

*Target ID* IE identifies the target for the relocation of SRNS. The target ID may be e.g. Target RNC-ID (for UMTS-UMTS relocation) or Cell Global ID of the relocation target (in case of UMTS to GSM relocation).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Target ID				
>Target RNC-ID				
>>Choice CN Domain				
<del>ID</del>				
>>>CS Domain ID				See ref. [3].
>>>>LAI	M		9.2.3.6	
>>>PS Domain ID				See ref. [3].
>>>LAI	M		9.2.3.6	
>>>>RAC	M <u>O</u>		9.2.3.7	
>>RNC-ID	M		INTEGER	
			(04095)	
>CGI		·		
>>LAI	M		9.2.3.6	
>>Cl	M		OCTET STRING (2)	

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, Korea, 13th – May17<sup>th</sup>, 2002

R3-021199

CHANGE REQUEST									
*	25.413	CR	443	₩ rev	<b>_</b> %	Current vers	5.	0.0	ж
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>#</b> symbols.									
Proposed c	hange affec	ets: 第 (U)	SIM ME	/UE	Radio /	Access Networ	k <mark>X</mark> Co	ore Ne	twork X
Title:	₩ Co	rrection of Ta	rget RNC-ID						
Source:	₩ <mark>R-\</mark>	WG3							
Work item c	ode: 郑 <mark>TE</mark>	I				Date: ♯	April 20	002	
Category:	<b>∺</b> A					Release: #	REL-5		
Reason for	Deta be fo	F (essential of A (correspond B (Addition of C (Functional D (Editorial mailed explanation of C (Functional Tabular formation of C (Functional mailed explanation of C (Functional mailed explanation of C (Function of	ds to a correction feature), modification of odification) ns of the above TR 21.900.	n in an eafeature) categorie	es can rong acco	Use <u>one</u> of 2 se) R96 R97 R98 R99 REL-4 REL-5	(GSM Pha (Release (Release (Release (Release (Release	ase 2) 1996) 1997) 1998) 1999) 4) 5)	
Summary of	f change:	Impact assess	ment towards tl	ne previou	ıs version	e ASN.1 descr of the specifical format with the	tion (same	releaso	<u>e):</u>
Consequence not approve		Potential m sequence.	iscoding of the	e Target-	RNC-ID	with a choice in	nstead of	a pure	;
Clauses affe	ected: #	9.2.1.25							
Other specs affected:	<b>;</b>	Test spe	re specificatio cifications ecifications	ns }		413 CR441 R9 413 CR442 RE			
Other comn	nents: #								

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

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- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 9.2.1.25 Target ID

*Target ID* IE identifies the target for the relocation of SRNS. The target ID may be e.g. Target RNC-ID (for UMTS-UMTS relocation) or Cell Global ID of the relocation target (in case of UMTS to GSM relocation).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Target ID				
>Target RNC-ID				
>>Choice CN Domain				
<del>ID</del>				
>>>CS Domain ID				See ref. [3].
>>>>LAI	M		9.2.3.6	
>>>PS Domain ID				See ref. [3].
>>>>LAI	M		9.2.3.6	
<del>&gt;&gt;&gt;</del> >>RAC	<u>MO</u>		9.2.3.7	
>>RNC-ID	M		INTEGER	
			(04095)	
>CGI				
>>LAI	M		9.2.3.6	
>>CI	M		OCTET STRING (2)	

# 3GPP TSG-RAN3 Meeting #29 Gyeongju, Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

	CHANGE REQUEST									
*	25.413 CR 444									
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>%</b> symbols.										
Proposed change at	ffects:   # (U)SIM ME/UE Radio Access Network   Core Network   X									
Title: #	SDU Format Information Presence									
Source: #	R-WG3									
Work item code:	TEI Date: 第 May, 2002									
	Release: # REL-5  Use one of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)  Detailed explanations of the above categories can be found in 3GPP TR 21.900.  Release: # REL-5  Use one of the following releases: 2 (GSM Phase 2)  R96 (Release 1996)  R97 (Release 1997)  R98 (Release 1999)  R99 (Release 1999)  REL-4 (Release 4)  REL-5 (Release 5)									
Reason for change:	Current definition for the presence of SDU Format Information Parameter IE in the SDU Parameters IE is defined as "present for RABs with the IE User Plane Mode set to 'support mode for pre-defined SDU sizes'". The User Plane Mode information may not be available in the RAB ASSIGNMENT REQUEST message for a RAB modification, so the RAN3 error handling mechanisms would not be able to properly determine presence for the SDU Format Information Parameter IE based solely on the received message.  The IEs contained in the SDU Format Information Parameter IE are the Subflow SDU Size IE and RAB Subflow Combination Bit Rate IE. This would imply that this information is applicable for all traffic classes.  However, in TS 23.107 the SDU Format Information Parameter is not marked as relevant for the Interactive and Background traffic classes in the sections discussing these attributes (6.4.3.2 & 6.4.3.3). Since these attributes are not relevant for the Interactive and Background traffic classes it would not be appropriate to allow this combination in the RAB parameters. There is no definition for how these attributes should be used for the Interactive and Background traffic classes.									
Summary of change	The condition for the presence of the SDU Format Information Parameter IE should be changed to optional with text added to the procedure sections indicating when the IE should be included. The IE should be present for RABs with User Plane Mode set to 'support mode for predefined SDU sizes' and whose traffic class is either 'Conversational' or 'Streaming'.									

Impact assessment towards the previous version of the specification (same

This CR has isolated impact with the previous version of the specification (same release) because the presence of the SDU Format Information Parameter IE could not be determined previously from the received message only if the User

Impact Analysis:

Plane Mode information was not also included in the received message. It could also be misunderstood that the SDU Format Information Parameter IE was applicable for all traffic classes.

This CR has an impact under a functional point of view.

# Consequences if not approved:

There would be a misalignment for relevant attributes between TS 23.107 and TS 25.413. Additional unintended functional support for RAB parameter combinations not described by the Stage 2 specification (TS 23.107) would be expected but not defined. User Plane support for multiple subflow SDU sizes for unintended traffic classes would be needed. The RAN3 error handling mechanisms cannot determine the presence of the IE based on the received message only.

Clauses affected:	<b>第</b> 8.2.2, 8.7.2, 9.2.1.3, 9.3.4
Other specs affected:	X Other core specifications Test specifications O&M Specifications  X 25.413 R99 CR 415, 25.413 R4 CR 416 None.
Other comments:	<b>x</b>

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

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- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ 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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

Table 2: Class 2

Elementary Procedure	Message
RAB Modification Request	RAB MODIFY REQUEST
RAB Release Request	RAB RELEASE REQUEST
lu 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	FORWARD SRNS CONTEXT
Source RNC to CN	
SRNS Context Forwarding to	FORWARD SRNS CONTEXT
Target RNC from CN	
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

Table 3: Class 3

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

The following applies concerning interference between Elementary Procedures:

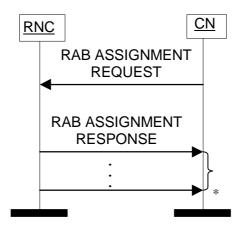
- The Reset procedure takes precedence over all other EPs.
- The Reset Resource procedure takes precedence over all other EPs except the Reset procedure.
- The Iu Release procedure takes precedence over all other EPs except the Reset procedure and the Reset Resource procedure.

# 8.2 RAB Assignment

### 8.2.1 General

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

## 8.2.2 Successful Operation



\* it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T  $_{RABAssgt}$  timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

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

- DL N-PDU sequence number (only when N-PDU sequence number is available in case of intersystem change from GPRS to UMTS or in some further cases described in [21]).
- UL N-PDU sequence number (only when N-PDU sequence number is available in case of intersystem change from GPRS to UMTS or in some further cases described in [21]).

For each RAB requested to modify, the message may contain:

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

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

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

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

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

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

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

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

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

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

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

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

- The RNC shall consider the priority level of the requested RAB, when deciding on the resource allocation.

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

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

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

If the Service Handover IE is included, this tells if the RAB

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

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

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

If the Service Handover IE is not included, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

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

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

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

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

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

For the CS domain, when an ALCAP is used, UTRAN shall report the outcome of a specific RAB to establish or modify only after the transport network control plane signalling, which is needed for RAB establishment or modification, has been executed. At a RAB establishment, the transport network control plane signalling shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification when *Transport Layer Address* (IE) and *Iu Transport Association* IEs are included, the RNC shall establish a new transport bearer. The transport network control plane signalling shall then use the included *Transport Layer Address* IE and *Iu Transport Association* IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If *Transport Layer Address* (IE) and *Iu Transport Association* IEs are not included, then the RNC may modify the already existing transport bearer.

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

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane 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 Assignment shall fail with the cause value "RNC unable to establish all RFCs".

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

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

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

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

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

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

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

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

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

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

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

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

# 8.2.3 Unsuccessful Operation

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

#### 8.2.4 Abnormal Conditions

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

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

- PDP Type Information.

- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

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

### 8.6.5 Co-ordination of Two Iu Signalling Connections

If the RNC has decided to initiate Relocation Preparation procedure for a UTRAN to UTRAN relocation, the RNC shall initiate simultaneously Relocation Preparation procedure on all Iu signalling connections existing for the UE.

For intersystem handover to GSM, Relocation Preparation procedure shall be initiated only towards the circuit switched CN.

The source RNC shall not trigger the execution of relocation of SRNS unless it has received RELOCATION COMMAND message from all Iu signalling connections for which the Relocation Preparation procedure has been initiated

If the source RNC receives RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection.

#### 8.7 Relocation Resource Allocation

#### 8.7.1 General

The purpose of the Relocation Resource Allocation procedure is to allocate resources from 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

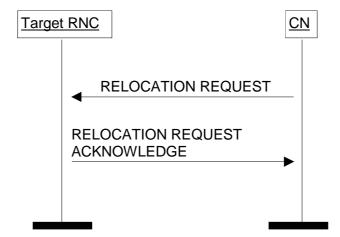


Figure 7: Relocation Resource Allocation procedure. Successful operation.

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 RAB configuration 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  $T_{\text{RELOCalloc.}}$ 

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

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

The RELOCATION REQUEST message shall contain 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)

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

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

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)

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 by 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.

If the *Integrity Protection Information* IE was included in the RELOCATION REQUEST message, the RNC shall include the *Chosen Integrity Protection Algorithm* IE within the RELOCATION REQUEST ACKNOWLEDGE message, if the *Encryption Information* IE was included, the RNC shall include the *Chosen Encryption Algorithm* IE.

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

If the *NAS Synchronisation Indicator* IE is contained in the RELOCATION REQUEST message, the target RNC shall pass it to the source RNC within the *RRC Container* IE contained in the *Target RNC to Source RNC Transparent Container* IE.

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

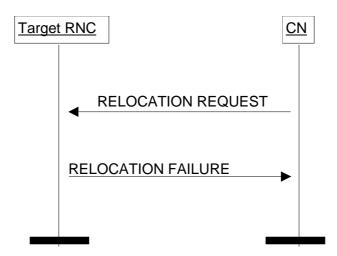


Figure 8: Relocation Resource Allocation procedure: Unsuccessful operation.

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.

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

#### 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.

#### 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.

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.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container* IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container* IE in RELOCATION REQUEST message was received.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB ID	М		BIT STRING (8)	

#### 9.2.1.3 RAB Parameters

The purpose of the RAB parameters IE group and other parameters within the RAB parameters IE group is to indicate all RAB attributes as defined in [7] for both directions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Traffic Class	M		ENUMERATED (conversational, streaming, interactive, background,)	Desc.: This IE indicates the type of application for which the Radio Access Bearer service is optimised
>RAB Asymmetry Indicator	M		ENUMERATED (Symmetric bidirectional, Asymmetric Uni directional downlink, Asymmetric Uni directional Uplink, Asymmetric Bidirectional,)	Desc.: This IE indicates asymmetry or symmetry of the RAB and traffic direction
>Maximum Bit Rate	M	1 to <nbr></nbr> SeparateTrafficDir ections>	INTEGER (116,000,000)	Desc.: This IE indicates the maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The unit is: bit/s Usage: When nbr- SeparateTrafficDirections is equal to 2, then Maximum Bit Rate attribute for downlink is signalled first, then Maximum Bit Rate attribute for uplink
>Guaranteed Bit Rate	C- iftrafficCon v-Stream	0 to <nbr></nbr> SeparateTrafficDir ections>	INTEGER (016,000,000)	Desc.: This IE indicates the guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The unit is: bit/s Usage:  1. When nbr-SeparateTrafficDirections is equal to 2, then Guaranteed Bit Rate for downlink is signalled first, then Guaranteed Bit Rate for uplink 2. Delay and reliability attributes only apply up to the guaranteed bit rate 3. Conditional valuefor the case of Support Mode for pre-defined SDU sizes: Set to highest not rate controllable bitrate, where bitrate is either  – one of the RAB subflow combination bitrate IEs (when present) or  – one of the calculated values given when dividing

IE/Group Name	Presence	Range	IE type and reference	Semantics description
To the parameters				the compound Subflow combination SDU sizes by the value of the IE Maximum SDU Size and then multiplying this result by the value of the IE Maximum Bit Rate.
>Delivery Order	М		ENUMERATED (delivery order requested, delivery order not requested)	Desc: This IE indicates whether the RAB shall provide insequence SDU delivery or not Usage: Delivery order requested: in sequence delivery shall be guaranteed by UTRAN on all RAB SDUs Delivery order not requested: in sequence delivery is not required from UTRAN
>Maximum SDU Size	М		INTEGER (032768)	Desc.: This IE indicates the maximum allowed SDU size The unit is: bit. Usage: Conditional value: Set to largest RAB Subflow Combination compound SDU size (when present) among the different RAB Subflow Combinations
>SDU parameters		1 to <maxrabsubflow s&gt;</maxrabsubflow 	See below	Desc.: This IE contains the parameters characterizing the RAB SDUs Usage Given per subflow with first occurence corresponding to subflow#1 etc
>Transfer Delay	C- iftrafficCon v-Stream		INTEGER (065535)	Desc.: This IE indicates the maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a RAB, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP The unit is: millisecond.  Usage:
>Traffic Handling Priority	C - iftrafficInter activ		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE specifies the relative importance for handling of all SDUs belonging to the radio access bearer compared to the SDUs of other bearers Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received.
>Allocation/Retention priority	0		See below	Desc.: This IE specifies the relative importance compared to other Radio access bearers for allocation and retention of the Radio access bearer.  Usage: If this IE is not received, the request is regarded as it cannot trigger the pre-emption process and it is vulnerable to the pre-emption process.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RAB parameters				
>Source Statistics Descriptor	C- iftrafficCon v-Stream		ENUMERATED (speech, unknown,)	Desc.: This IE specifies characteristics of the source of submitted SDUs Usage:
>Relocation Requirement	0		ENUMERATED (lossless, none, , realtime)	This IE shall be present for RABs towards the PS domain, otherwise it shall not be present. Desc.: This IE is no longer used. Usage: It shall always be set to "none" when sent and it shall always be ignored when received.

Range Bound	Explanation
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.

Range Bound	Explanation
maxRABSubflows	Maximum number of Subflows per RAB. Value is 7

Condition	Explanation		
IftrafficConv-Stream	This IE shall be present if the <i>Traffic Class</i> IE is set to		
	"Conversational" or "Streaming"		
IftrafficInteractiv	This IE shall be present if the <i>Traffic Class</i> IE is set to "Interactive"		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU parameters				
> SDU Error Ratio	C- ifErroneou sSDU			Desc.: This IE indicates the fraction of SDUs lost or detected as erroneous. This is a Reliability attribute Usage: The attribute is coded as follows: Mantissa * 10 - exponent
>>Mantissa	M		INTEGER (19)	
>>Exponent	М		INTEGER (16)	
>Residual Bit Error Ratio	M			Desc.: This IE indicates the undetected bit error ratio for each subflow in the delivered SDU. This is a Reliability attribute. Usage: The attribute is coded as follows: Mantissa * 10 - exponent

>>Mantissa	M		INTEGER (19)	
>>Exponent	М		INTEGER (18)	
>Delivery Of Erroneous SDU	M		ENUMERATED (yes, no, no- error-detection- consideration)	Desc.: This IE indicates whether SDUs with detected errors shall be delivered or not. In case of unequal error protection, the attribute is set per subflow This is a Reliability attribute Usage: Yes: error detection applied, erroneous SDU delivered No. Error detection is applied, erroneous SDU discarded no-error-detection-consideration: SDUs delivered without considering error detection. If the RNC receives this IE set to 'Yes' and the User Plane Mode IE is set to 'transparent mode', it should consider it as 'no-error-detection-consideration'.
>SDU format information Parameter	C- IfSMPredef inedSDUSi zeO	1 to <maxrabsubflow Combinations&gt;</maxrabsubflow 	See below	Desc.: This IE contains the list of possible exact sizes of SDUs and/or RAB Subflow Combination bit rates. Given per RAB Subflow Combination with first occurence corresponding to RAB Subflow Combination number 1. It shall always be present for rate controllable RABs.

Range Bound	Explanation
maxRABSubflowCombinations	Maximum number of RAB Subflow
	Combinations. Value is 64.

Condition	Explanation
IfErroneousSDU	This IE shall be present if the Delivery Of Erroneous SDU IE is set
	to "Yes" or "No".
IfSMPredefinedSDUSize	This IE shall be present for RABs with the IE User Plane Mode set
	to 'support mode for pre-defined SDU sizes'.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SDU Format Information Parameter				At least one of the Subflow SDU size IE and the RAB Subflow Combination bit rate IE shall be present when SDU format information Parameter IE is present.  For the case subflow SDUs are transmitted at constant time interval, only one of the two IEs shall be present.
>Subflow SDU Size	0		INTEGER (04095)	Desc.: This IE indicates the exact size of the SDU. The unit is: bit. Usage: This IE is only used for RABs that have predefined SDU size(s). It shall be present for RABs having more than one subflow. For RABs having only one subflow, this IE shall be present only when the RAB is rate controllable and the SDU size of some RAB Subflow Combination(s) is different than the IE Maximum SDU Size. When this IE is not present and SDU format information Parameter is present, then the Subflow SDU size for the only existing subflow takes the value of the IE Maximum SDU size.
>RAB Subflow Combination Bit Rate	0		INTEGER (016,000,000 )	Desc.: This IE indicates the RAB Subflow Combination bit rate. The unit is: bit/s. Usage: When this IE is not present and SDU format information parameter is present then all Subflow SDUs are transmitted (when there is data to be transmitted) at a constant time interval. The value of this IE shall not exceed the maximum value of the IEs 'Maximum Bit Rate'. The value 0 of RAB Subflow Combination bitrate indicates that the RAB uses discontinuous transfer of the SDUs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Allocation/Retention Priority				
>Priority Level	M		INTEGER {spare (0), highest (1),, lowest (14), no priority (15)} (015)	Desc.: This IE indicates the priority of the request. Usage: Values between 1 and 14 are ordered in decreasing order of priority, '1' being the highest and '14' the lowest. Value 0 shall be treated as a logical error if received. The priority level and the preemption indicators may be used to determine whether the request has to be performed unconditionally and immediately
>Pre-emption Capability	M		ENUMERATE D(shall not trigger pre- emption, may trigger pre- emption)	Descr.: This IE indicates the preemption capability of the request on other RABs Usage: The RAB shall not pre-empt other RABs or, the RAB may pre-empt other RABs The Pre-emption Capability indicator applies to the allocation of resources for a RAB and as such it provides the trigger to the pre-emption procedures/processes of the RNS.
>Pre-emption Vulnerability	M		ENUMERATE D(not pre- emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the RAB to preemption of other RABs. Usage: The RAB shall not be pre-empted by other RABs or the RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the RAB, unless modified and as such indicates whether the RAB is a target of the pre-emption procedures/processes of the RNS
>Queuing Allowed	M		ENUMERATE D(queuing not allowed, queuing allowed)	Desc.: This IE indicates whether the request can be placed into a resource allocation queue or not. Usage: Queuing of the RAB is allowed Queuing of the RAB is not allowed Queuing allowed indicator applies for the entire duration of the RAB, unless modified.

## 9.2.1.4 Cause

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

#### 9.3.4 Information Element Definitions

#### SOME UNCHANGED PARTS ARE OMITTED

```
rAB-AsymmetryIndicator
                                    RAB-AsymmetryIndicator,
    maxBitrate
                       RAB-Parameter-MaxBitrateList,
    quaranteedBitRate
                           RAB-Parameter-GuaranteedBitrateList OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    deliveryOrder
                            DeliveryOrder,
    maxSDU-Size
                        MaxSDU-Size,
    sDU-Parameters
                           SDU-Parameters,
    transferDelav
                           TransferDelay OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    trafficHandlingPriority
                               TrafficHandlingPriority OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Interactive" --,
    allocationOrRetentionPriority AllocationOrRetentionPriority OPTIONAL,
    sourceStatisticsDescriptor SourceStatisticsDescriptor OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    relocationRequirement RelocationRequirement OPTIONAL,
    iE-Extensions
                            ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
    . . .
RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
RAB-SubflowCombinationBitRate ::= INTEGER (0..16000000)
RAB-TrCH-Mapping ::=
                        SEQUENCE ( SIZE (1..maxNrOfRABs)) OF
    RAB-TrCH-MappingItem
RAB-TrCH-MappingItem ::= SEQUENCE {
    rAB-ID
                   RAB-ID,
    trCH-ID-List
                   TrCH-ID-List,
RAC
                    ::= OCTET STRING (SIZE (1))
RAI ::= SEOUENCE {
    lai
                    LAI,
    rAC
                    RAC,
                            ProtocolExtensionContainer { {RAI-ExtIEs} } OPTIONAL,
    iE-Extensions
RAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
```

```
RateControlAllowed ::= ENUMERATED {
    not-allowed,
    allowed
RealTimeLoad
                ::= INTEGER (0..100)
RelocationRequirement ::= ENUMERATED {
    lossless,
    none,
    . . . ,
    realtime
RelocationType ::= ENUMERATED {
    ue-not-involved,
    ue-involved,
    . . .
RepetitionNumber0 ::= INTEGER (0..255)
RepetitionNumber1 ::= INTEGER (1..256)
ReportArea ::= ENUMERATED {
    service-area,
    geographical-area,
    . . .
RequestedGPSAssistanceData ::= OCTET STRING (SIZE (1 .. 38 ))
        -- gpsAssistanceData as defined in 24.080 --
RequestedLocationRelatedDataType ::= ENUMERATED {
    decipheringKeysUEBasedOTDOA,
    decipheringKeysAssistedGPS,
    dedicatedAssistanceDataUEBasedOTDOA,
    dedicatedAssistanceDataAssistedGPS,
    . . .
Requested-RAB-Parameter-Values ::= SEQUENCE {
    requestedMaxBitrates
                                        Requested-RAB-Parameter-MaxBitrateList
                                             Requested-RAB-Parameter-GuaranteedBitrateList
    requestedGuaranteedBitrates
    iE-Extensions
                            ProtocolExtensionContainer { { Requested-RAB-Parameter-Values-ExtIEs} } OPTIONAL,
Requested-RAB-Parameter-Values-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
```

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OPTIONAL,

OPTIONAL,

```
Requested-RAB-Parameter-MaxBitrateList ::= SEOUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
Requested-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
RequestType ::= SEOUENCE {
    event
                       Event,
    reportArea
                       ReportArea,
    horizontalAccuracyCode
                               INTEGER (0..127)
                                                    OPTIONAL,
    verticalAccuracyCode
                                   INTEGER (0..127)
                                                       OPTIONAL,
    -- To be used if Geographical Coordinates shall be reported with a requested accuracy. --
    responseTime
                                    ResponseTime OPTIONAL,
    -- This IE shall be present if the Event IE is set to 'Direct' and the Report Area IE is set to 'Geographical Area'. --
    positioningPriority
                                   PositioningPriority OPTIONAL,
    -- This IE shall be present if the Event IE is set to 'Direct' or "Change of Service Area". --
    clientType
                                    ClientType OPTIONAL
    -- This IE shall be present if the Event IE is set to 'Direct'. --
ResidualBitErrorRatio ::= SEQUENCE {
    mantissa
                       INTEGER (1..9),
    exponent
                       INTEGER (1..8),
    iE-Extensions
                            ProtocolExtensionContainer { {ResidualBitErrorRatio-ExtIEs} } OPTIONAL
-- ResidualBitErrorRatio = mantissa * 10^-exponent
ResidualBitErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
ResponseTime
               ::= ENUMERATED {
    lowdelay,
    delaytolerant,
RNC-ID
                        ::= INTEGER (0..4095)
-- RNC-ID
                           ::= BIT STRING (SIZE (12))
-- Harmonized with RNSAP and NBAP definitions
RRC-Container
                           ::= OCTET STRING
-- S
SAC
                   ::= OCTET STRING (SIZE (2))
SAI ::= SEQUENCE {
    pLMNidentity
                                PLMNidentity,
    lAC
                    LAC,
    sAC
                    SAC,
    iE-Extensions
                           ProtocolExtensionContainer { {SAI-ExtIEs} } OPTIONAL
```

```
SAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SAPI ::= ENUMERATED {
    sapi-0,
    sapi-3,
SDU-ErrorRatio ::= SEOUENCE {
    mantissa
                      INTEGER (1..9),
    exponent
                       INTEGER (1..6),
                      ProtocolExtensionContainer { {SDU-ErrorRatio-ExtIEs} } OPTIONAL
    iE-Extensions
-- SDU-ErrorRatio = mantissa * 10^-exponent
SDU-ErrorRatio-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-FormatInformationParameters ::= SEQUENCE (SIZE (1..maxRAB-SubflowCombination)) OF
    SEQUENCE {
        subflowSDU-Size
                                SubflowSDU-Size
                                                    OPTIONAL.
       rAB-SubflowCombinationBitRate RAB-SubflowCombinationBitRate OPTIONAL,
       iE-Extensions
                                ProtocolExtensionContainer { {SDU-FormatInformationParameters-ExtIEs} } OPTIONAL,
        . . .
SDU-FormatInformationParameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
SDU-Parameters ::= SEOUENCE (SIZE (1..maxRAB-Subflows)) OF
    SEQUENCE +
        sDU-ErrorRatio
                               SDU-ErrorRatio OPTIONAL
        -- This IE shall be present if the Delivery Of Erroneous SDU IE is set to "Yes" or "No" --,
                                   ResidualBitErrorRatio,
        residualBitErrorRatio
        deliveryOfErroneousSDU
                                   DeliveryOfErroneousSDU,
        sDU-FormatInformationParameters SDU-FormatInformationParameters OPTIONAL
        - This IE shall be present for RABs with the IE User Plane Mode set to support mode for predefined SDU sizes . ,
       iE-Extensions
                                ProtocolExtensionContainer { {SDU-Parameters-ExtIEs} } OPTIONAL,
        . . .
SDU-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
Service-Handover ::= ENUMERATED {
  handover-to-GSM-should-be-performed,
```

# 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, South Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

# Tdoc R3-021304 resubmission of Tdoc R3-021029

	CHANGE REQUEST											
*	25.413	CR	449	<b>≋rev</b>	-	ж (	Current vers	ion:	3.9.0	¥		
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>%</b> symbols.												
Proposed c	hange affec	ets: # (U)	SIM MI	E/UE	Radi	o Acc	ess Networl	k X	Core Ne	etwork X		
Title:	ж <mark>Ех</mark>	tension Conta	iner Indicatio	ns								
Source:	₩ R-	WG3										
Work item o	eode: Ж ТЕ	il .					Date: ♯	29	April 2002	2		
Category:  Reason for	Deta be f		ds to a correction feature), modification of odification) and of the above TR 21.900.	feature) e categorie ble to dist	es can inguisl differe	h or re	R97 R98 R99 REL-4 REL-5 ecognize exisons (R99 o	the fo (GSN (Rele (Rele (Rele (Rele (Rele	Ilowing release 1996) ase 1997) ase 1998) ase 1999) ase 1999) ase 4) ase 5)  ons that wetions, neverthered	ere		
Summary o	f change: <b>%</b>	ASN.1.  Impact assertelease):	ric indication  essment towa  s no impact b	ards the p	<u>reviou:</u>	s vers	ion of the s	pecific	cation (sa			
Consequen not approve		one ASN.1	ld to an incre message or l eases (Relea	E when the	nose w	vould i						
Clauses affe	ected: #	9.3.3, 9.3.4										
Other specs	s #	Test spe	re specifications ecifications	ons }			/4.4.0 CR45 /5.0.0 CR45					
Other comn	nents: ೫											

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

Comprehensive information and tips about how to create CRs can be found at: <a href="http://www.3gpp.org/3G">http://www.3gpp.org/3G</a> Specs/CRs.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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

Release 99 3GPP TS 25.413 V3.9.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.3 not shown
OverloadExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable the indication to the RNC which CN domain is suffering the signalling traffic overload --
   { ID id-CN-DomainIndicator
                                   CRITICALITY ignore EXTENSION CN-DomainIndicator
                                                                                 PRESENCE optional } ,
   . . .
Lots of unaffected ASN1 in 9.3.3 not shown
```

Release 99 3GPP TS 25.413 V3.9.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.4 not shown
CriticalityDiagnostics-IE-List-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable reporting the message structure down to the erroneous IE --
   { ID id-MessageStructure CRITICALITY ignore
                                                   EXTENSION MessageStructure PRESENCE optional } |
-- Extension for Release 99 to enable reporting if a reported error is due to a not understood or a missing IE --
   { ID id-TypeOfError
                             CRITICALITY ignore
                                                   EXTENSION TypeOfError
                                                                             PRESENCE mandatory },
   . . .
Lots of unaffected ASN1 in 9.3.4 not shown
```

# 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, South Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

# Tdoc R3-021305 resubmission of Tdoc R3-021030

	CHANGE REQUEST											
*	25.413	CR CR	450	жrev	-	<b>%</b> (	Current vers	ion:	4.4.0	¥		
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>%</b> symbols.												
Proposed c	hange affec	cts: # (U)	SIM MI	E/UE	Radi	o Acc	ess Network	k X	Core Ne	etwork X		
Title:	ж <mark>Ех</mark>	tension Conta	<mark>iner Indicatio</mark>	ns								
Source:	₩ R-	WG3										
Work item of	code:	I					Date: ♯	29 /	April 2002	<u> </u>		
Category:  Reason for	Deta be f	D (editorial mailed explanation ound in 3GPP)  Currently this added in diff	ds to a correcting feature), modification of odification) and of the abover 121.900.	feature) e categorie ble to dist	es can inguisl differe	h or re	R97 R98 R99 REL-4 REL-5 ecognize extensions (R99 of	the fol (GSM (Relea (Relea (Relea (Relea tensio	llowing rele I Phase 2) ase 1996) ase 1997) ase 1998) ase 1999) ase 4) ase 5)	rere		
Summary o	f change: %	ASN.1.  Impact assertlease):	eric indication essment towa	ards the p	<u>reviou:</u>	s vers	sion of the sp	pecific	cation (sa			
Consequen not approve		one ASN.1	nd to an incre message or eases (Relea	E when the	nose w	vould						
Clauses affe	ected: #	9.3.3, 9.3.4										
Other specs	s #	Test spe	re specifications ecifications	ons ≱			/3.9.0 CR44 /5.0.0 CR45					
Other comn	nents: ೫											

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

Comprehensive information and tips about how to create CRs can be found at: <a href="http://www.3gpp.org/3G">http://www.3gpp.org/3G</a> Specs/CRs.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 <a href="ftp://ftp.3gpp.org/specs/">ftp://ftp.3gpp.org/specs/</a> 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.

Release 4 3GPP TS 25.413 V4.4.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupItem-RelocReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
   EXTENSION Alt-RAB-Parameters
                                                                           PRESENCE optional },
   . . .
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
   EXTENSION Ass-RAB-Parameters
                                                                           PRESENCE optional } ,
Lots of unaffected ASN1 in 9.3.3 not shown
LocationReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable report of Last Known Service Area with its Age over Iu --
   Lots of unaffected ASN1 in 9.3.3 not shown
OverloadExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable the indication to the RNC which CN domain is suffering the signalling traffic overload --
   { ID id-CN-DomainIndicator
                                CRITICALITY ignore EXTENSION CN-DomainIndicator
                                                                          PRESENCE optional } ,
   . . .
Lots of unaffected ASN1 in 9.3.3 not shown
```

Lots of unaffected ASN1 in 9.3.3 not shown

Release 4 3GPP TS 25.413 V4.4.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.4 not shown
CriticalityDiagnostics-IE-List-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable reporting the message structure down to the erroneous IE --
   { ID id-MessageStructure CRITICALITY ignore
                                                     EXTENSION MessageStructure PRESENCE optional } |
-- Extension for Release 99 to enable reporting if a reported error is due to a not understood or a missing IE --
   { ID id-TypeOfError
                              CRITICALITY ignore
                                                     EXTENSION TypeOfError
                                                                               PRESENCE mandatory },
   . . .
Lots of unaffected ASN1 in 9.3.4 not shown
```

## 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, South Korea, 13<sup>th</sup> – 17<sup>th</sup> May 2002

# Tdoc R3-021306 resubmission of Tdoc R3-021031

	CHANGE REQUEST										
*	25.4	113	CR	451	жrev	-	¥	Current vers	ion:	5.0.0	¥
For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the <b>%</b> symbol											nbols.
Proposed cl	hange a	ffects:	°₩ (U)S	IM M	E/UE	Radi	io Ac	cess Network	k X	Core Ne	etwork X
Title:	ж	Exten	sion Contai	ner Indication	ons						
Source:	ж	R-W	<b>9</b> 3								
Work item c	ode: 🕱	TEI						Date: ₩	29	April 2002	2
Category:		Use on F A B C D Detailed be foun	dded in diffe	s to a corrective ature), addification of diffication) s of the above 21.900.	feature) e categorie ble to dist	s can inguis	h or i	R97 R98 R99 REL-4 REL-5	the for (GSM (Rele (Rele (Rele (Rele (Rele	llowing relations as the second secon	ere
Summary of	f chang	/ ! !	MSN.1.  mpact asservelease):  This CR has	ssment towa	ards the property of the prope	reviou	s ver	ent) for all thosesion of the sp	<u>pecific</u>	cation (sa	<u>me</u>
Consequence not approve		C		nessage or	IE when the	nose v	vould	eaders to cat I mix extension			
Clauses affe	ected:	<b>#</b> 9	9.3.3, 9.3.4								
Other specs	;	₩ X	Other core Test spec O&M Spe		ons ≱			V3.9.0 CR44 V4.4.0 CR45			
Other comm	nents:	¥									

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

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- 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.

Release 5 3GPP TS 25.413 V5.0.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupItem-RelocReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
   EXTENSION Alt-RAB-Parameters
                                                                            PRESENCE optional },
   . . .
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
   EXTENSION Ass-RAB-Parameters
                                                                            PRESENCE optional } ,
Lots of unaffected ASN1 in 9.3.3 not shown
LocationReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable report of Last Known Service Area with its Age over Iu --
   Lots of unaffected ASN1 in 9.3.3 not shown
OverloadExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable the indication to the RNC which CN domain is suffering the signalling traffic overload --
                                 CRITICALITY ignore EXTENSION CN-DomainIndicator
                                                                            PRESENCE optional } ,
   { ID id-CN-DomainIndicator
-- Extension for Release 5 to enable NNSF --
   { ID id-GlobalCN-ID
                                 CRITICALITY ignore EXTENSION GlobalCN-ID
                                                                            PRESENCE optional } ,
```

```
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupOrModifyItemSecond-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    { ID id-Alt-RAB-Parameters
                                   CRITICALITY ignore
                                                           EXTENSION Alt-RAB-Parameters
                                                                                              PRESENCE optional },
    . . .
Lots of unaffected ASN1 in 9.3.3 not shown
RAB-SetupOrModifiedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    { ID id-Ass-RAB-Parameters CRITICALITY ignore
                                                                                              PRESENCE optional },
                                                           EXTENSION Ass-RAB-Parameters
    . . .
Lots of unaffected ASN1 in 9.3.3 not shown
```

Release 5 3GPP TS 25.413 V5.0.0 (2002-03)

#### 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
Lots of unaffected ASN1 in 9.3.4 not shown
CriticalityDiagnostics-IE-List-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable reporting the message structure down to the erroneous IE --
   { ID id-MessageStructure CRITICALITY ignore
                                                     EXTENSION MessageStructure PRESENCE optional } |
-- Extension for Release 99 to enable reporting if a reported error is due to a not understood or a missing IE --
   { ID id-TypeOfError
                              CRITICALITY ignore
                                                     EXTENSION TypeOfError
                                                                               PRESENCE mandatory },
   . . .
Lots of unaffected ASN1 in 9.3.4 not shown
```

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Other comments: #

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

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

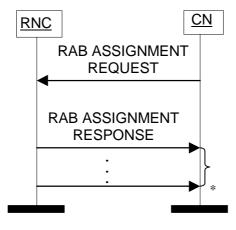
- 1) Fill out the above form. The symbols above marked **%** contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

## 8.2 RAB Assignment

#### 8.2.1 General

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

## 8.2.2 Successful Operation



\* it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T  $_{RABAssgt}$  timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

- RAB ID.
- NAS Synchronisation Indicator (only when available).
- RAB parameters (including e.g. Allocation/Retention Priority).
- User Plane Information (i e User Plane Mode and UP Mode Versions).
- Transport Layer Information.
- PDP Type Information (only for PS)

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

For each RAB requested to modify, the message may contain:

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

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

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

Upon reception of the RAB ASSIGNMENT REQUEST message UTRAN shall execute the requested RAB configuration.

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

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

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

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

- The RNC shall consider the priority level of the requested RAB, when deciding on the resource allocation.
- If the requested RAB is allowed for queuing and the resource situation so requires, RNC may place the RAB in the establishment queue.
- The priority levels and the pre-emption indicators may (singularly or in combination) be used to determine whether the RAB assignment has to be performed unconditionally and immediately. If the requested RAB is marked as "may trigger pre-emption" and the resource situation so requires, RNC may trigger the pre-emption procedure which may then cause the forced release of a lower priority RAB which is marked as "pre-emptable".

Whilst the process and the extent of the pre-emption procedure is operator dependent, the pre-emption indicators, if given in the RAB ASSIGNMENT REQUEST message, shall be treated as follows:

- 1. The values of the last received *Pre-emption Vulnerability* IE and *Priority Level* IE shall prevail.
- 2. If the *Pre-emption Capability* IE is set to "may trigger pre-emption", then this allocation request may trigger the pre-emption procedure.
- 3. If the *Pre-emption Capability* IE is set to "shall not trigger pre-emption", then this allocation request shall not trigger the pre-emption procedure.
- 4. If the *Pre-emption Vulnerability* IE is set to "pre-emptable", then this connection shall be included in the pre-emption process.
- 5. If the *Pre-emption Vulnerability* IE is set to "not pre-emptable", then this connection shall not be included in the pre-emption process.
- 6. If the *Priority Level* IE is set to "no priority" the given values for the *Pre-emption Capability* IE and *Pre-emption Vulnerability* IE shall not be considered. Instead the values "shall not trigger pre-emption" and "not pre-emptable" shall prevail.
- If the *Allocation/Retention Priority* IE is not given in the RAB ASSIGNMENT REQUEST message, the allocation request shall not trigger the pre-emption process and the connection may be pre-empted and considered to have the value "lowest" as priority level. Moreover, queuing shall not be allowed.
- The UTRAN pre-emption process shall keep the following rules:
  - 1. UTRAN shall only pre-empt RABs with lower priority, in ascending order of priority.
  - 2. The pre-emption may be done for RABs belonging to the same UE or to other UEs.

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

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

If the Service Handover IE is included, this tells if the RAB:

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

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

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

If the Service Handover IE is not included, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

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

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

List of RABs failed to release.

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

- setup/modified or;
- released or;
- queued or;
- failed to setup/modify or;
- failed to release.

For the CS domain, UTRAN shall report the <u>successful</u> outcome of a specific RAB to establish or modify only after the <u>Iu user plane at RNL level-transport network control plane signalling</u>, which is needed for RAB establishment or modification, has been executed is ready to be used in UL and DL. The transport network control plane signalling required to set up the transport bearer shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification, it is up to the RNC to decide if <u>any transport network control plane signalling shall be performed a new transport bearer shall be set up for the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE-or if the already existing transport bearer shall be used. If the RNC decides to establish a new transport bearer, the transport network control plane signalling shall use the included *Transport Layer Address* IE and *Iu Transport Association* IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If no Transport Layer Information was included in the RAB ASSIGNMENT REQUEST message at a RAB modification, no transport network control plane signalling shall occur.</u>

For each RAB successfully modified towards the PS domain, if the RNC has changed the *Transport Layer Address* IE and/or the *Iu Transport Association* IE, it shall include the new value(s) in the RAB ASSIGNMENT RESPONSE message.

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. This initialisation is described in [6].

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

If none of the RABs have been queued, the CN shall stop timer T <sub>RABAssgt.</sub> And the RAB Assignment procedure terminates. In that case, the procedure shall also be terminated in UTRAN.

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

For the queued RABs, indicated in the first RAB ASSIGNMENT RESPONSE message, UTRAN shall report the outcome of the queuing for every RAB individually or for several RABs in subsequent RAB ASSIGNMENT

RESPONSE message(s). This is left to implementation. UTRAN shall stop  $T_{QUEUING}$  when all RABs have been either successfully established or modified or failed to establish or modify. The RAB Assignment procedure is then terminated both in CN and UTRAN when all RABs have been responded to.

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

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

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

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

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

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

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

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

# 8.2.3 Unsuccessful Operation

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

#### 8.2.4 Abnormal Conditions

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

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

- PDP Type Information.
- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- 5. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

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

Next change

### 8.5 lu Release

### 8.5.1 General

The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

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

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

### 8.5.2 Successful Operation

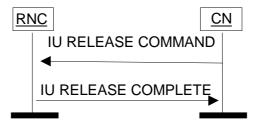


Figure 2: lu Release procedure. Successful operation.

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

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

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

When the RNC receives the IU RELEASE COMMAND message:

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

The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

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

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

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

### 8.5.3 Abnormal Conditions

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

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

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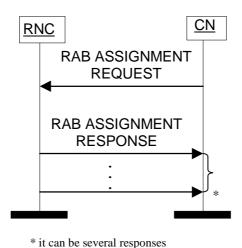
- 1) Fill out the above form. The symbols above marked **%** contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <a href="ftp://www.3qpp.org/specs/">ftp://www.3qpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 8.2 RAB Assignment

### 8.2.1 General

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

### 8.2.2 Successful Operation



"It can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T  $_{RABAssgt}$  timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

- RAB ID.
- NAS Synchronisation Indicator (only when available).
- RAB parameters (including e.g. Allocation/Retention Priority).
- User Plane Information (i.e required User Plane Mode and required UP Mode Versions).

- Transport Layer Information.
- PDP Type Information (only for PS)
- Data Volume Reporting Indication (only for PS).
- DL GTP-PDU sequence number (only when GTP-PDU sequence number is available in cases of handover from GPRS to UMTS or when establishing a RAB for an existing PDP context).
- UL GTP-PDU sequence number (only when GTP-PDU sequence number is available in cases of handover from GPRS to UMTS or when establishing a RAB for an existing PDP context).
- DL N-PDU sequence number (only when N-PDU sequence number is available in case of handover from GPRS to UMTS).
- UL N-PDU sequence number (only when N-PDU sequence number is available in case of handover from GPRS to UMTS).

For each RAB requested to modify, the message may contain:

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

The *Transport Layer Information* IE may only be present if at least one more IE than the *RAB ID* IE and the *NAS Synchronisation Indicator* IE is also included.

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

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

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

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

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

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

- The RNC shall consider the priority level of the requested RAB, when deciding on the resource allocation.
- If the requested RAB is allowed for queuing and the resource situation so requires, RNC may place the RAB in the establishment queue.

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

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

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

If the Service Handover IE is included, this tells if the RAB

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

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

The Service Handover IE shall only influence decisions made regarding UTRAN initiated handovers.

If the Service Handover IE is not included, the decision whether to perform a handover to GSM is only an internal UTRAN matter.

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

- List of RABs successfully established or modified.

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

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

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

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

For the CS domain, UTRAN shall report the <u>successful</u> outcome of a specific RAB to establish or modify only after the <u>Iu user plane at RNL leveltransport network control plane signalling</u>, which is needed for RAB establishment or modification, has been executed is ready to be used in UL and DL. At a RAB establishment, the transport network control plane signalling <u>required to set up the transport bearer</u> shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification, it is up to the RNC to decide if <u>any transport network control plane signalling shall be performed new transport bearer shall be set up or if the already existing transport bearer shall be used. If the RNC decides to establish a new transport bearer, the transport network control plane signalling shall use the possibly-included *Transport Layer Address* IE and *Iu Transport Association* IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If the RNC decides to modify the already existing transport bearer, the transport network control plane signalling shall not use the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE. That is, re-binding with *Iu Transport Association* IE shall not be done.</u>

For each RAB successfully modified towards the PS domain, if the RNC has changed the *Transport Layer Address* IE and/or the *Iu Transport Association* IE, it shall include the new value(s) in the RAB ASSIGNMENT RESPONSE message.

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. If the RNC is requested to execute the user plane initialisation for the *User Plane Mode* "support mode for predefined SDU sizes", it shall initialise all RAB subflow combinations on Iu as indicated in the *RAB parameters* IE. If not all of the indicated RAB subflow combinations can be initialised the RAB Assignment fails with the cause value "RNC unable to establish all RFCs". The user plane initialisation is described in ref.[6].

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

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

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

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

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

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

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

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

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

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

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

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

### 8.2.3 Unsuccessful Operation

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

### 8.2.4 Abnormal Conditions

For a RAB requested to be modified, if only the *RAB ID* IE, the *NAS Synchronisation Indicator* IE and the *Transport Layer Information* IE are included in the *First Setup or Modify Item* IE this RAB shall not be modified, and the

corresponding *RAB ID* IE with *Cause* IE shall be included in the "RABs Failed To Setup Or Modify List" in the RAB ASSIGNMENT RESPONSE message.

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

- PDP Type Information.
- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- 5. The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

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

#### 8.5 lu Release

#### 8.5.1 General

The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

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

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

### 8.5.2 Successful Operation

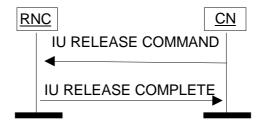


Figure 2: lu Release procedure. Successful operation.

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

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

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

When the RNC receives the IU RELEASE COMMAND message:

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

The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

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

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

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

#### 8.5.3 Abnormal Conditions

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

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

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

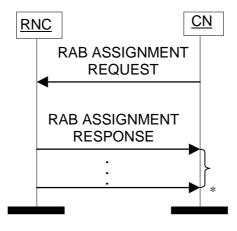
- 1) Fill out the above form. The symbols above marked \$\mathbb{X}\$ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 8.2 RAB Assignment

### 8.2.1 General

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

### 8.2.2 Successful Operation



\* it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN shall initiate the procedure by sending a RAB ASSIGNMENT REQUEST message. When sending the RAB ASSIGNMENT REQUEST message, the CN shall start the T RABASSET timer.

The CN may request UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

- list of RABs to establish or modify with their bearer characteristics;
- list of RABs to release.

For each RAB requested to establish, the message shall contain:

- RAB ID.
- NAS Synchronisation Indicator (only when available).
- RAB parameters (including e.g. Allocation/Retention Priority).
- User Plane Information (i.e required User Plane Mode and required UP Mode Versions).
- Transport Layer Information.

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

For each RAB requested to modify, the message may contain:

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

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

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

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

For each RAB request to release, the message shall contain:

- RAB ID.
- Cause.

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

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

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

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

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

- The RNC shall consider the priority level of the requested RAB, when deciding on the resource allocation.
- If the requested RAB is allowed for queuing and the resource situation so requires, RNC may place the RAB in the establishment queue.

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

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

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

If the Service Handover IE is included, this tells if the RAB

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

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

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

If the Service Handover IE is not included, the decision whether to perform an inter-system handover to GSM is only an internal UTRAN matter.

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

- List of RABs successfully established or modified.

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

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

For each RAB successfully established towards the PS domain, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully modified or released towards the PS domain, for which data volume reporting has been requested, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message.

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

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

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

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

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

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

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane 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 Assignment shall fail with the cause value "RNC unable to establish all RFCs".

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

If none of the RABs have been queued, the CN shall stop timer T <sub>RABAssgt.</sub> And the RAB Assignment procedure terminates. In that case, the procedure shall also be terminated in UTRAN.

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

For each RAB that is queued the following outcomes shall be possible:

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer T<sub>OUEUING</sub>.

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

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

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

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

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

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

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

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

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

## 8.2.3 Unsuccessful Operation

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

### 8.2.4 Abnormal Conditions

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

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

- PDP Type Information.

- Data Volume Reporting Indication.

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

#### **Interactions with Relocation Preparation procedure:**

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

- 1. The RNC shall terminate the RAB Assignment procedure indicating unsuccessful RAB configuration modification:
  - for all queued RABs;
  - for RABs not already established or modified, and
  - for RABs not already released;

with the cause "Relocation triggered".

- 2. The RNC shall terminate the RAB Assignment procedure indicating successful RAB configuration modification:
  - for RABs already established or modified but not yet reported to the CN, and
  - for RABs already released but not yet reported to the CN.
- 3. The RNC shall report this outcome of the procedure in one RAB ASSIGNMENT RESPONSE message.
- 4. The RNC shall invoke relocation by sending the RELOCATION REQUIRED message to the active CN node(s).
- The CN shall terminate the RAB Assignment procedure at reception of the RAB ASSIGNMENT RESPONSE message.

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

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

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

Next change

### 8.5 lu Release

### 8.5.1 General

The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

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

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

### 8.5.2 Successful Operation

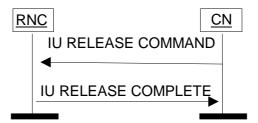


Figure 2: lu Release procedure. Successful operation.

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

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

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

When the RNC receives the IU RELEASE COMMAND message:

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

The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

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

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

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

### 8.5.3 Abnormal Conditions

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

# 3GPP TSG-RAN WG3 Meeting #29 Gyeongiu Korea 13th – May17<sup>th</sup> 2001

R3-021540

Gyeongju, Korea, 13th – May17 <sup>th</sup> , 2002											
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#### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <a href="http://www.3gpp.org/3G">http://www.3gpp.org/3G</a> Specs/CRs.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 <a href="ftp://www.3gpp.org/specs/">ftp://www.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

#### 8.6.4 Abnormal Conditions

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

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

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

### 8.6.5 Co-ordination of Two Iu Signalling Connections

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

For intersystem handover to GSM, Relocation Preparation procedure shall be initiated only towards the circuit switched CN.

The source RNC shall not trigger the execution of relocation of SRNS unless it has received RELOCATION COMMAND message from all Iu signalling connections for which the Relocation Preparation procedure has been initiated.

If the source RNC receives RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection.

### 8.7.4 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.

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.

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, tThe target RNC shall ensure that there is no conflicting information in the same Target RNC to Source RNC Transparent Container IE is included in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via the two CN domains different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the Target RNC to Source RNC Transparent Container IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the Source RNC to Target RNC Transparent Container IE in RELOCATION REQUEST message was received.

Consequences if not approved:

### 3GPP TSG-RAN WG3 Meeting #29 Gyeongiu, Korea, 13th – May17<sup>th</sup>, 2002

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Other specs	★ X Other core specifications   ★ TS25413 CR463 R99 TS25413 CR465  ★ TS25413 CR463 R99 TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465  ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465   ★ TS25413 CR463 R99 TS25413 CR465    ★ TS25413 CR463 R99 TS25413 CR463 R99 TS25413 CR465    ★ TS25413 CR463 R99 TS25413 CR465     ★ TS25413 CR463 R99 TS25413 CR465     ★ TS25413 CR463 R99 TS25413 CR465
•	REL-5
affected:	Test specifications
	O&M Specifications
Other comments:	<b>x</b>

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- 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.

#### 8.6.4 Abnormal Conditions

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

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

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

### 8.6.5 Co-ordination of Two Iu Signalling Connections

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

For intersystem handover to GSM, Relocation Preparation procedure shall be initiated only towards the circuit switched CN.

The source RNC shall not trigger the execution of relocation of SRNS unless it has received RELOCATION COMMAND message from all Iu signalling connections for which the Relocation Preparation procedure has been initiated.

If the source RNC receives RELOCATION PREPARATION FAILURE message from the CN, the RNC shall initiate Relocation Cancel procedure on the other Iu signalling connection for the UE if the other Iu signalling connection exists and if the Relocation Preparation procedure is still ongoing or the procedure has terminated successfully in that Iu signalling connection.

### 8.7.4 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.

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.

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, tThe target RNC shall ensure that there is no conflicting information in the same Target RNC to Source RNC Transparent Container IE is included in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via the two CN domains different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the Target RNC to Source RNC Transparent Container IE in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the Source RNC to Target RNC Transparent Container IE in RELOCATION REQUEST message was received.

### 3GPP TSG-RAN WG3 Meeting #29 Gyeongju, Korea, 13th – May17<sup>th</sup>, 2002

R3-021542

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Consequences if not approved:

# The Source to Target container could be sent via only one domain. The target to Source container sent back via two domains could have differences even if not conflicting.

The impact can be considered isolated because the change affects only the system

functions relocation preparation and relocation resource allocation.

Clauses affected:	$\mathfrak{R}$	8.6.4,8.6.5, 8.7.4,8.7.5		
	_			
Other specs	$\mathfrak{R}$	X Other core specifications	$\mathfrak{R}$	TS25413 CR463 R99 TS25413 CR464
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#### Interactions with Iu Release procedure:

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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.

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Current version: 3 9 0  $\mathfrak{R}$ 25.413 CR 467 For **HELP** on using this form, see bottom of this page or look at the pop-up text over the **%** symbols. ME/UE (U)SIM Radio Access Network X Core Network X Proposed change affects: ₩ Title: **Clarification for the usage of the cause value** R-WG3 Source: **Date:** 第 2002-May ж **F** Category: Release: # R99 Use one of the following categories: Use one of the following releases: **F** (correction) (GSM Phase 2) 2 **A** (corresponds to a correction in an earlier release) R96 (Release 1996) **B** (addition of feature). R97 (Release 1997) **C** (functional modification of feature) R98 (Release 1998) **D** (editorial modification) R99 (Release 1999) REL-4 (Release 4) Detailed explanations of the above categories can REL-5 (Release 5) be found in 3GPP TR 21.900. Reason for change: # The cause value, "Abstract Syntax Error (Ignore and Notify)", should not be set to the Cause IE. Please see R3-020971. In case of abstract syntax error occurs in the IE which has the criticality of Ignore and Notify, the procedure shall be continue as if that error IE is not present and report in the response message(for class 1), or in Errir Indication (for class 2) that the error IE has been ignored. However, in the above case, if the receiver further detect an error e.g. sementic error which should terminate the procedure, it is not clear what cause value(either Abstract Syntax Error (Ignore and Notify) or Sementic Error) shall be set in the failure messsage(for class 1) or Error ndication (for class 2). Impact Analysis statement was corrected. Rev.0 It was clarified that if an error that terminates a procedure occurs, the returned cause value shall reflect the error that caused the termination of the procedure even if one or more abstract syntax errors with criticality "ignore and notify" have earlier occurred within the same procedure. Consequences if # If this CR is not approved, unsuitable cause value might be set to the Cause IE. not approved: Impact Analysis: Impact assessment towards the previous version of the specification (same

release):

		CR099 on TS25.419v4.4.0 CR100 on TS25.419v5.0.0 CR654 on TS25.423v3.9.0 CR655 on TS25.423v4.4.0 CR656 on TS25.423v5.0.0 CR684 on TS25.433v3.9.0 CR685 on TS25.433v4.4.0 CR686 on TS25.433v5.0.0 CR018 on TS25.453v5.3.0
affected:	Test specifications O&M Specifications	
Other comments:	 f	

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- 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.

# 10.5 Exceptions

The error handling for all the cases described hereafter shall take precedence over any other error handling described in the other subclauses of clause 10.

- If any type of error (Transfer Syntax Error, Abstract Syntax Error or Logical Error) is detected in the ERROR INDICATION message, it shall not trigger the Error Indication procedure in the receiving Node but local error handling.
- In case a response message, failure message or Error Indication message needs to be returned, but the information necessary to determine the receiver of that message is missing, the procedure shall be considered as unsuccessfully terminated and local error handling shall be initiated.
- If an error that terminates a procedure occurs, the returned cause value shall reflect the error that caused the termination of the procedure even if one or more abstract syntax errors with criticality "ignore and notify" have earlier occurred within the same procedure.

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Summary of chang	ge: Ж	Rev.0 It was cause even if	clarified that value shall one or more occurred w	t if an err reflect the	or that to e error th ct syntax	ermina at cau errors	tes a sed the	he terminat	ion of	the proce	edure
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affected:	Test specifications O&M Specifications	
Other comments:	 f	

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