TSG RAN Meeting #18   **RP-020749**
New Orleans, Louisiana, USA, 3 - 6 December, 2002

Title	**RAN3 Early UE CR 5 (R99 only) on Inclusion of UE Specific Behaviour Information in RANAP containers as an alternative of RRC transparent container**
Source	**TSG RAN WG3**
Agenda Item	**8.7.11**

The following CR is one of 5 CRs (provided in different RAN Tdocs) which:
- **address the topic 'Early UE Handling in UTRAN' which is currently a Study Item in TSG RAN,**
- **have the status 'technically correct' at RAN WG3 instead of 'agreed' by RAN WG3,**
- **are provided to TSG RAN to give TSG RAN a base for agreeing about a solution,**
- **will need mirror CRs (REL-4, REL5) as soon as a solution is agreed at TSG RAN.**

Note: 'technically correct' means 'correct' from a RAN WG3 point of view without making statements about the status of completeness of the solution regarding other RAN WGs (like RAN2) or TSGs (like CN1, CN4, GERAN).

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-022604	25.413	3.11.1	3.12.0	R99	538	2	F	Inclusion of UE Specific Behaviour Information in RANAP containers as an alternative of RRC container	RANimp-FSEarlyUE

CR-Form-v7

CHANGE REQUEST

| ⌘ | **25.413** | CR | **538** | ⌘ rev | **2** | ⌘ | Current version: | **3.11.1** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title: ⌘	Inclusion of UE Specific Behaviour Information in RANAP containers as an alternative of RRC transparent container	
Source: ⌘	RAN WG3	
Work item code: ⌘	RANimp-FSEarlyUE	***Date:*** ⌘ 12/11/2002
Category: ⌘ **F**		***Release:*** ⌘ R99

Use <u>one</u> 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.

Use <u>one</u> of the following releases:
2   (GSM Phase 2)
R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change: ⌘	**This CR is required only if RAN WG2 has not standardised the use of RRC transparent container to convey the UE Specific Behaviour Information in intra-system and inter-system relocation/handover cases.** UE Specific Behaviour Information sent by the UE and received by the RNC during RRC connection establishment needs to be forwarded <u>via RANAP container(s)</u> to target node during relocation/handover in the following cases: - if the UE Specific Behaviour Information is not transferred via the RRC transparent container, - in the UMTS-to-GSM handovers if the GSM BSS needs to use it for a possible specific behaviour in e.g. a subsequent GSM-to-UMTS handover procedure (there is no such requirement today in GERAN).
Summary of change: ⌘	UE Specific Behaviour Information (bitmap information) is added in the "*Source RNC to Target RNC Transparent Container*" IE in case of intra-system relocation and in the "*Old BSS To New BSS Information*" IE in case of inter-system handover to GSM. <u>Rev 2:</u> - addition of reference [x1] in the procedural text of Relocation Resource Allocation section. - column headers have been renamed in the tabular format table of section 9.2.1.y (presence and range). - the word "variable" is removed from UE Specific Behaviour Information 2. - 9.2.1.y is removed. - the RRC IEs are described as bit strings without length.

		Rev1:
		- "may" is changed to "should" in the procedural text about the RNC behaviour when receiving Relocation Request.
		- ASN.1 sequence extension is corrected.
		- reference to new TR on early UE handling is added.
		- alignment to revised RAN2 agreed CRs:
		   - Conformance State Information xx is changed to Specific Behaviour Information xx
		   - Specific Behaviour Information idle is changed from 7 bits to 4 bits
		
		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 protocol point of view.
		
		The impact can be considered isolated because it does not affect any existing functionality.

Consequences if not approved:	⌘	The UE Specific Behaviour Information will not be available to UTRAN after a relocation.

Clauses affected:	⌘	2, 8.6.2, 8.7.2, 9.2.1.28, 9.2.1.x, 9.3.4, 9.3.6

		Y	N			
Other specs	⌘	X		Other core specifications	⌘	TS 25.413 REL-4, CRnum TS 25.413 REL-5, CRnum 25.331 and 08.08
affected:			X	Test specifications		
			X	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 http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

2   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply".

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 23.930: "Iu Principles".

[2]   3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".

[3]   3GPP TS 25.401: "UTRAN Overall Description".

[4]   3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5]   3GPP TS 25.412: "UTRAN Iu interface signalling transport".

[6]   3GPP TS 25.415: "UTRAN Iu interface user plane protocols".

[7]   3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[8]   3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".

[9]   3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".

[10]   3GPP TS 25.331: "Radio Ressource Control (RRC) protocol specification".

[11]   3GPP TS 08.08: "Mobile services Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".

[12]   3GPP TS 12.08: "Subscriber and equipment trace".

[13]   ITU-T Recommendation X.691 (12/1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

[14]   ITU-T Recommendation X.680 (12/1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[15]   ITU-T Recommendation X.681 (12/1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[16]   3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[17]   3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".

[18]   3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".

[19]   3GPP TS 23.003: "Numbering, addressing and identification".

[20]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[21]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[22]   3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

[23]   3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[24]   3GPP TS 12.20: "Base Station System (BSS) management information".

[x1]   3GPP TR ab.cde: "Recommended infrastructure measures to overcome specific Mobile Station (MS) faults" (or equivalent document).

8.6   Relocation Preparation

8.6.1   General

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

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

## 8.6.2   Successful Operation
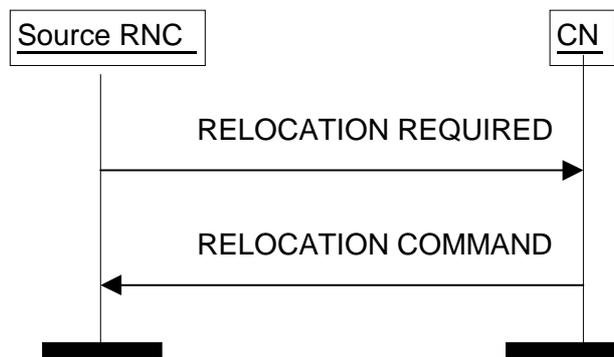
Figure 5: Relocation Preparation procedure. Successful operation.

The source RNC shall initiate the procedure by generating RELOCATION REQUIRED message. The source RNC shall decide whether to initiate the intra-system Relocation or the inter-system handover. In case of intra-system Relocation the source RNC shall indicate in the *Source ID* IE the RNC-ID of the source RNC and in the *Target ID* IE the RNC-ID of the target RNC. In case of inter-system handover the source RNC shall indicate in the *Source ID* IE the Service Area Identifier and in the *Target ID* IE the cell global identity of the cell in the target system. The source RNC shall indicate the appropriate cause value for the Relocation in the *Cause* IE. Typical cause values are "Time critical Relocation", "Resource optimisation relocation", "Relocation desirable for radio reasons", "Directed Retry".

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

In case of intra-system Relocation, the source RNC shall include in the RELOCATION REQUIRED message the *Source RNC to Target RNC Transparent Container* IE. This container shall include the *Relocation Type* IE and the number of Iu signalling connections existing for the UE by setting correctly the *Number of Iu Instances* IE.

Only in case of intra-system relocation, the *Source RNC-to-Target RNC transparent container* IE shall include the *Integrity Protection Key* IE from the last received domain on which security mode control procedure has been successfully performed and the associated *Chosen Integrity Protection Algorithm* IE that has been selected for this domain.

Only in case of intra-system relocation, the *Source RNC-to-Target RNC transparent container* IE shall include the *Ciphering Key* IE for the signalling data from the last received domain on which security mode control procedure has been successfully performed and the associated *Chosen Encryption Algorithm* IE that has been selected for this domain.

Only in case of intra-system relocation, for each domain where the security mode control procedure has been successfully performed in the source RNC, the *Source RNC-to-Target RNC transparent container* IE shall include the *Chosen Encryption Algorithm* IE of CS (PS respectively) user data corresponding to the ciphering alternative that has been selected for this domain. If the security mode control procedure had not been successful or performed for one domain or had proposed no ciphering alternative, the *Chosen Encryption Algorithm* IE for the user data of this domain shall not be included. When both the CS and the PS user data *Chosen Encryption Algorithm* IEs are provided, they shall be the same.

This container shall include the *RRC Container* IE. If the *Relocation Type* IE is set to "UE not involved in relocation of SRNS" and the UE is using DCH(s), DSCH(s) or USCH(s), the *Source RNC to Target RNC Transparent Container* IE shall include the mapping between each RAB subflow and transport channel identifier(s), i.e. if the RAB is carried on a DCH(s), the DCH ID(s) shall be included, and when it is carried on DSCH(s) or USCH(s), the DSCH ID(s) or USCH ID(s) respectively shall be included. If the *Relocation Type* IE is set to "UE not involved in relocation of SRNS", the *d-RNTI* IE shall be included in the *Source RNC to Target RNC Transparent Container* IE. If the *Relocation Type* IE is set to "UE involved in relocation of SRNS", the *Target Cell ID* IE shall be included in the *Source RNC to Target RNC Transparent Container* IE.

If any of UE Specific Behaviour Information 1 idle, UE Specific Behaviour Information 1 interRAT, UE Specific Behaviour Information 2 is available, the *UE Specific Behaviour Information* IE shall be included in the *Source RNC to Target RNC Transparent Container* IE in case of intra-system relocation and in the *Old BSS To New BSS Information* IE in case of inter-system handover to GSM.

If the UE Specific Behaviour Information 1 idle is available, it shall be included in the *UE Specific Behaviour Information 1 idle* IE. If the UE Specific Behaviour Information 1 interRAT is available, it shall be included in the *UE Specific Behaviour Information 1 interRAT* IE. If the UE Specific Behaviour Information 2 is available, it shall be included in the *UE Specific Behaviour Information 2* IE.

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

-   shall include *MS Classmark 2* and *MS Classmark 3* IEs received from the UE in the RELOCATION REQUIRED message to the CN.

-   shall include the *Old BSS to New BSS* IE within the RELOCATION REQUIRED message only if the information is available.

The source RNC shall send the RELOCATION REQUIRED message to the CN and the source RNC shall start the timer $T_{RELOCprep.}$

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

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

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

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

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

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

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

Interactions with other procedures:

If, after RELOCATION REQUIRED message is sent and before the Relocation Preparation procedure is terminated, the source RNC receives a RANAP message initiating an other connection oriented RANAP class 1 or class 3 procedure

(except IU RELEASE COMMAND message, which shall be handled normally) via the same Iu signalling connection, the source RNC shall either:

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

   or

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

If during the Relocation Preparation procedure the source RNC receives a DIRECT TRANSFER message it shall be handled normally.

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

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

8.7 Relocation Resource Allocation

8.7.1 General

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

8.7.2 Successful Operation
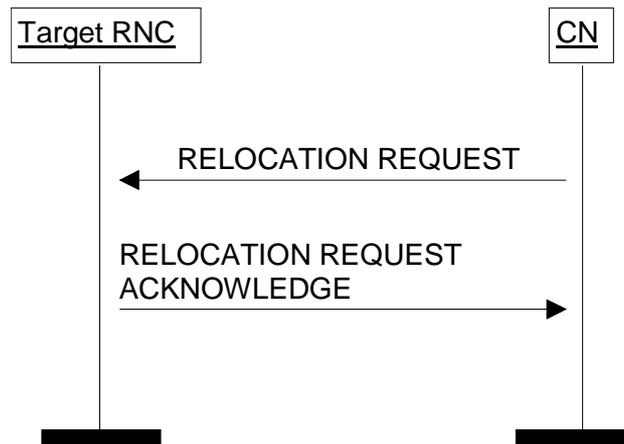
Figure 7: Relocation Resource Allocation procedure. Successful operation.

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

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

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

The RELOCATION REQUEST message shall contain following IEs

- *Permanent NAS UE Identity* (if available)

- *Cause*

- *CN Domain Indicator*

- *Source RNC To Target RNC Transparent Container*

- *Iu Signalling Connection Identifier*

- *Integrity Protection Information* (if available)

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

- *RAB-ID*

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

- *RAB parameters*

- *User Plane Information*

- *Transport Layer Address*

- *Iu Transport Association*

- *Data Volume Reporting Indication* (only for PS)

- *PDP Type Information* (only for PS)

The RELOCATION REQUEST message may include following IEs:

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

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

- *Service Handover*

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

- RAB-ID

- User plane Information

- Priority level, queuing and pre-emption indication

- Service Handover

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

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

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

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN, and which the RNC is required to store and remember for the duration of the Iu connection.

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

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

In case of intra-system relocation, if no *Integrity Protection Key* IE (*Encryption Key* IE respectively) is provided within the *Source RNC-to-Target RNC transparent container* IE, the target RNC shall not start integrity protection (ciphering respectively).

In case of intra-system relocation, when an *Encryption Key* IE is provided within the *Source RNC-to-Target RNC transparent container* IE, the target RNC may select to use a ciphering alternative where an algorithm is used. It shall in this case make use of this key to cipher its signalling data whatever the selected algorithm. The *Encryption Key* IE that is contained within the *Encryption Information* IE of the RELOCATION REQUEST message shall never be considered for ciphering of signalling data.

In case of intra-system relocation, when an *Integrity Protection Key* IE is provided within the *Source RNC-to-Target RNC transparent container* IE, the target RNC shall select one integrity algorithm to start integrity and shall in this case make use of this key whatever the selected algorithm. The integrity protection key that is contained within the *Integrity Protection Information* IE of the RELOCATION REQUEST message shall never be considered.

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

In case the *UE Specific Behaviour Information* IE is included in the *Source RNC-to-Target RNC transparent container* IE, the RNC should use this information as defined in [x1].

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

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

- The target RNC may accept a requested RAB only if the RAB can be supported by the target RNC.

- Other RABs shall be rejected by the target RNC in the RELOCATION REQUEST ACKNOWLEDGE message with an appropriate value for *Cause* IE, e.g. "Unable to Establish During Relocation".

- The target RNC shall include information adapted to the resulting RAB configuration in the target to source RNC transparent container to be included in the RELOCATION REQUEST ACKNOWLEDGE message sent to the CN. If the target RNC supports triggering of the Relocation Detect procedure via the Iur interface, the RNC shall assign a d-RNTI for the context of the relocation and include it in the container. If two CNs are involved in the relocation of SRNS, the target RNC may, however, decide to send the container to only one CN.

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

- The target RNC may accept a RAB only if the radio bearer(s) for the RAB either exist(s) already, and can be used for the RAB by the target RNC, or does not exist before the relocation but can be established in order to support the RAB in the target RNC.

- If existing radio bearers are not related to any RAB that is accepted by target RNC, the radio bearers shall be ignored during the relocation of SRNS and the radio bearers shall be released by radio interface protocols after completion of relocation of SRNS.

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

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

- *RAB ID*

- *Transport Layer Address* (only for PS)

- *Iu Transport Association* (only for PS)

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

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

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

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

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

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

9.2.1.28 Source RNC to Target RNC Transparent Container

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

This IE is transparent to CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RRC Container	M		OCTET STRING		-	-
Number of Iu Instances	M		INTEGER (1..2)		-	
Relocation Type	M		9.2.1.23		-	
Chosen Integrity Protection Algorithm	O		9.2.1.13	Indicates the integrity protection algorithm.	-	
Integrity Protection Key	O		Bit String (128)		-	
Chosen Encryption Algorithm	O		9.2.1.14	Indicates the algorithm for ciphering of signalling data.	-	
Ciphering Key	O		Bit String (128)		-	
Chosen Encryption Algorithm	O		9.2.1.14	Indicates the algorithm for ciphering of CS user data.	-	
Chosen Encryption Algorithm	O		9.2.1.14	Indicates the algorithm for ciphering of PS user data.	-	
d-RNTI	C - ifUEnotinvolved		INTEGER (0..1048575)		-	
Target Cell ID	C - ifUEinvolved		INTEGER (0..268435455)	This information element identifies a cell uniquely within UTRAN and consists of RNC-ID (12 bits) and C-ID (16 bits) as defined in TS 25.401 [3].	-	
RAB TrCH Mapping	O	1 to <maxnoofRABs>			-	
>RAB ID	M		9.2.1.2		-	
>RAB Subflow	M	1 to <maxRAB-Subflows>		The RAB Subflows shall be presented in an order that corresponds to the order in which the RBs are presented per RAB in the RRC container included in this IE.	-	
>> Transport Channel IDs					-	
>>> DCH ID	O		INTEGER (0..255)	The DCH ID is the identifier of an active dedicated transport channel. It is unique for each active DCH among the active DCHs simultaneously allocated for the same UE.	-	
>>> DSCH ID	O		INTEGER (0..255)	The DSCH ID is the identifier of an active downlink shared transport channel. It is unique for each DSCH among the	-	

					active DSCHs simultaneously allocated for the same UE.		
>>> USCH ID	O			INTEGER (0..255)	The USCH ID is the identifier of an active uplink shared transport channel. It is unique for each USCH among the active USCHs simultaneously allocated for the same UE.	-	
<u>UE Specific Behaviour Information</u>	<u>O</u>			<u>9.2.1.x</u>		<u>YES</u>	<u>ignore</u>

Condition	Explanation
IfUEnotinvolved	This IE shall be present if the *Relocation type* IE is set to "UE not involved in relocation of SRNS".
IfUEinvolved	This IE shall be present if the *Relocation type* IE is set to "UE involved in relocation of SRNS".

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

9.2.1.42   Message Structure

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

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

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

9.2.1.x   UE Specific Behaviour Information

This IE contains the information elements "UE Specific Behaviour Information 1 idle", "UE Specific Behaviour Information 1 interRAT" and "UE Specific Behaviour Information 2" sent by the UE to the UTRAN and defined in [10].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Specific Behaviour Information	M			
> UE Specific Behaviour Information 1 idle	O		bit string	UE Specific Behaviour Information 1 idle as defined in [10]
> UE Specific Behaviour Information 1 interRAT	O		bit string	UE Specific Behaviour Information 1 interRAT as defined in [10]
> UE Specific Behaviour Information 2	O		bit string	UE Specific Behaviour Information 2 as defined in [10]

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,
    id-UE-Specific-Behaviour-Information

FROM RANAP-Constants

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

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

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 NOT SHOWN   ****

```
SourceRNC-ToTargetRNC-TransparentContainer ::= SEQUENCE {
    rRC-Container          RRC-Container,
    numberOfIuInstances    NumberOfIuInstances,
    relocationType         RelocationType,
```

```
    chosenIntegrityProtectionAlgorithm ChosenIntegrityProtectionAlgorithm   OPTIONAL,
    integrityProtectionKey       IntegrityProtectionKey          OPTIONAL,
    chosenEncryptionAlgorithForSignalling ChosenEncryptionAlgorithm    OPTIONAL,
    cipheringKey            EncryptionKey              OPTIONAL,
    chosenEncryptionAlgorithmForCS   ChosenEncryptionAlgorithm        OPTIONAL,
    chosenEncryptionAlgorithmForPS   ChosenEncryptionAlgorithm        OPTIONAL,
    d-RNTI            D-RNTI                  OPTIONAL
    -- This IE shall be present if the Relocation type IE is set to "UE not involved in relocation of SRNS"--,
    targetCellId         TargetCellId             OPTIONAL
    -- This IE shall be present if the Relocation type IE is set to "UE involved in relocation of SRNS"--,
    rAB-TrCH-Mapping         RAB-TrCH-Mapping             OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {SourceRNC-ToTargetRNC-TransparentContainer-ExtIEs} } OPTIONAL,
    ...
}

SourceRNC-ToTargetRNC-TransparentContainer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to transfer the UE Specific Behaviour Information to the Target RNC --
    {   ID id-UE-Specific-Behaviour-Information CRITICALITY ignore    EXTENSION UE-Specific-Behaviour-Information PRESENCE optional },
    ...
}
```

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 NOT SHOWN   ****

```
-- U

UE-Specific-Behaviour-Information-1-idle          ::= BIT STRING
-- Reference: 25.331

UE-Specific-Behaviour-Information-1-interRAT        ::= BIT STRING
-- Reference: 25.331

UE-Specific-Behaviour-Information-2         ::= BIT STRING
-- Reference: 25.331

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

UE-Specific-Behaviour-Information   ::= SEQUENCE {
    uESpecificBehaviourInformation1idle     UE-Specific-Behaviour-Information-1-idle    OPTIONAL,
    uESpecificBehaviourInformation1interRAT   UE-Specific-Behaviour-Information-1-interRAT   OPTIONAL,
    uESpecificBehaviourInformation2       UE-Specific-Behaviour-Information-2 OPTIONAL,
```

```
    iE-Extensions          ProtocolExtensionContainer { {EncryptionInformation-ExtIEs} } OPTIONAL,
    ...
}


UL-GTP-PDU-SequenceNumber       ::= INTEGER (0..65535)
```

9.3.6 Constant Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

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

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


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

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

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

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

id-AreaIdentity                              INTEGER ::= 0
id-CN-DomainIndicator                        INTEGER ::= 3
id-Cause                                     INTEGER ::= 4
id-ChosenEncryptionAlgorithm                 INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm        INTEGER ::= 6
id-ClassmarkInformation2                     INTEGER ::= 7
id-ClassmarkInformation3                     INTEGER ::= 8
id-CriticalityDiagnostics                    INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber                 INTEGER ::= 10
id-EncryptionInformation                     INTEGER ::= 11
id-IntegrityProtectionInformation            INTEGER ::= 12
id-IuTransportAssociation                    INTEGER ::= 13
id-L3-Information                            INTEGER ::= 14
id-LAI                                       INTEGER ::= 15
id-NAS-PDU                                   INTEGER ::= 16
id-NonSearchingIndication                    INTEGER ::= 17
id-NumberOfSteps                             INTEGER ::= 18
id-OMC-ID                                    INTEGER ::= 19
```

```
id-OldBSS-ToNewBSS-Information                      INTEGER ::= 20
id-PagingAreaID                                     INTEGER ::= 21
id-PagingCause                                      INTEGER ::= 22
id-PermanentNAS-UE-ID                               INTEGER ::= 23
id-RAB-ContextItem                                  INTEGER ::= 24
id-RAB-ContextList                                  INTEGER ::= 25
id-RAB-DataForwardingItem                           INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq               INTEGER ::= 27
id-RAB-DataForwardingList                           INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq               INTEGER ::= 29
id-RAB-DataVolumeReportItem                         INTEGER ::= 30
id-RAB-DataVolumeReportList                         INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem                  INTEGER ::= 32
id-RAB-DataVolumeReportRequestList                  INTEGER ::= 33
id-RAB-FailedItem                                   INTEGER ::= 34
id-RAB-FailedList                                   INTEGER ::= 35
id-RAB-ID                                           INTEGER ::= 36
id-RAB-QueuedItem                                   INTEGER ::= 37
id-RAB-QueuedList                                   INTEGER ::= 38
id-RAB-ReleaseFailedList                            INTEGER ::= 39
id-RAB-ReleaseItem                                  INTEGER ::= 40
id-RAB-ReleaseList                                  INTEGER ::= 41
id-RAB-ReleasedItem                                 INTEGER ::= 42
id-RAB-ReleasedList                                 INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp                       INTEGER ::= 44
id-RAB-RelocationReleaseItem                        INTEGER ::= 45
id-RAB-RelocationReleaseList                        INTEGER ::= 46
id-RAB-SetupItem-RelocReq                           INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck                        INTEGER ::= 48
id-RAB-SetupList-RelocReq                           INTEGER ::= 49
id-RAB-SetupList-RelocReqAck                        INTEGER ::= 50
id-RAB-SetupOrModifiedItem                          INTEGER ::= 51
id-RAB-SetupOrModifiedList                          INTEGER ::= 52
id-RAB-SetupOrModifyItem                            INTEGER ::= 53
id-RAB-SetupOrModifyList                            INTEGER ::= 54
id-RAC                                              INTEGER ::= 55
id-RelocationType                                   INTEGER ::= 56
id-RequestType                                      INTEGER ::= 57
id-SAI                                              INTEGER ::= 58
id-SAPI                                             INTEGER ::= 59
id-SourceID                                         INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer       INTEGER ::= 61
id-TargetID                                         INTEGER ::= 62
id-TargetRNC-ToSourceRNC-TransparentContainer       INTEGER ::= 63
id-TemporaryUE-ID                                   INTEGER ::= 64
id-TraceReference                                   INTEGER ::= 65
id-TraceType                                        INTEGER ::= 66
id-TransportLayerAddress                            INTEGER ::= 67
id-TriggerID                                        INTEGER ::= 68
id-UE-ID                                            INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber                        INTEGER ::= 70
id-RAB-FailedtoReportItem                           INTEGER ::= 71
id-RAB-FailedtoReportList                           INTEGER ::= 72
```

```
id-KeyStatus                                   INTEGER ::= 75
id-DRX-CycleLengthCoefficient                  INTEGER ::= 76
id-IuSigConIdList                              INTEGER ::= 77
id-IuSigConIdItem                              INTEGER ::= 78
id-IuSigConId                                  INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf              INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf              INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem             INTEGER ::= 84
id-RAB-ContextFailedtoTransferList             INTEGER ::= 85
id-GlobalRNC-ID                                INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp                  INTEGER ::= 87
id-MessageStructure                            INTEGER ::= 88
id-TypeOfError                                 INTEGER ::= 93
id-UE-Specific-Behaviour-Information               INTEGER ::= xx

END
```