

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

RP-020751

Title CRs (Rel-4 and Rel-5 Category A) to TS 25.413
Source TSG RAN WG3
Agenda Item 7.3.4

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-022300	25.413	4.6.0	4.7.0	REL-4	516	-	F	Correction to RANAP RESET procedure	TEI4
R3-022301	25.413	5.2.0	5.3.0	REL-5	517	-	A	Correction to RANAP RESET procedure	TEI4
R3-022539	25.413	4.6.0	4.7.0	REL-4	521	1	F	Rel4 Common CR after RANAP review	TEI4
R3-022540	25.413	5.2.0	5.3.0	REL-5	522	1	A	Rel4 Common CR after RANAP review	TEI4
R3-022578	25.413	4.6.0	4.7.0	REL-4	525	2	F	Correction to enable Rel4 extensions in Location Reporting Control procedure.	TEI4
R3-022579	25.413	5.2.0	5.3.0	REL-5	526	2	A	Correction to enable Rel4 extensions in Location Reporting Control procedure.	TEI4
R3-022537	25.413	4.6.0	4.7.0	Rel-4	534	1	F	Encoding of information elements.	TEI4
R3-022538	25.413	5.2.0	5.3.0	Rel-5	535	1	A	Encoding of information elements.	TEI4

3GPP TSG-RAN WG3 Meeting #33
 Sophia Antipolis, France, 11-15 November 2002

R3-022300

CR-Form-v7
CHANGE REQUEST
⌘ 25.413 CR 516 ⌘ rev - ⌘ Current version: 4.6.0 ⌘

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

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

Title:	⌘ Correction to RANAP RESET procedure
Source:	⌘ RAN WG3
Work item code:	⌘ TEI4 Date: ⌘ 18/09/2002
Category:	⌘ F Release: ⌘ Rel-4 Use <u>one</u> of the following categories: Use <u>one</u> of the following releases: F (correction) 2 (GSM Phase 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) Detailed explanations of the above categories can Rel-4 (Release 4) be found in 3GPP TR 21.900 . Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ In R99 TS25.413 specification, the RNC, when the procedure is initiated by the RNC, must include the <i>Global RNC-ID</i> IE in the RESET message. This is to inform the CN of which RNC is initiating the Reset, and it is needed since this message uses the SCCP connectionless procedure. In Rel-4 and Rel-5 TS 25.413 specifications, the sentence "The RNC shall include the <i>Global RNC-ID</i> IE in the RESET message" has disappeared. However, this information is needed by the CN.
Summary of change:	⌘ The sentence "The RNC shall include the <i>Global RNC-ID</i> IE in the RESET message" is re-introduced in section 8.26.2.2 <u>Impact assessment towards the previous version of the specification (same release):</u> This CR has isolated impact towards the previous version of the specification (same release). This CR has an impact under functional and protocol point of view. The impact can be considered isolated because it only affects the RANAP Reset function. <u>Impact assessment towards the previous release of the specification:</u> This CR is backward compatible with R99 version of the specification.
Consequences if not approved:	⌘ If this CR is not approved, the RNC will not include the <i>Global RNC-ID</i> IE in the RESET message, and the CN node will not be able to know which RNC initiated

the procedure. Moreover, there would be an interoperability problem between a R99 RNC and a Rel-4 CN node, and between a Rel-4 RNC and a R99 CN node.

Clauses affected:	⌘	8.26.2.2										
Other specs affected:	⌘	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ 25.413 v5.2.0 CR517
		Y	N									
		X										
	X											
	X											
		Test specifications										
		O&M Specifications										
Other comments:	⌘											

8.26.2.2 Reset Procedure Initiated from the UTRAN

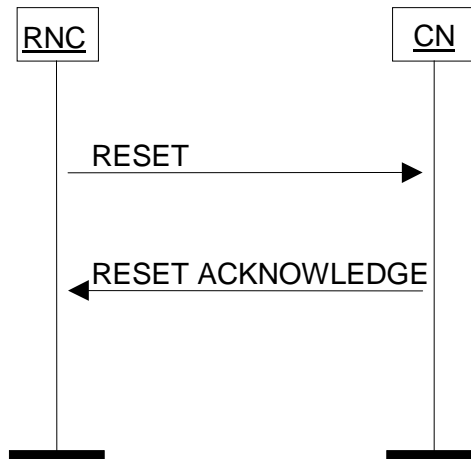


Figure 30: Reset procedure initiated from the UTRAN. Successful operation.

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

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

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

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

Interactions with other procedures:

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

3GPP TSG-RAN WG3 Meeting #33
 Sophia Antipolis, France, 11-15 November 2002

R3-022301

CR-Form-v7
CHANGE REQUEST
⌘ 25.413 CR 517 ⌘ rev - ⌘ Current version: 5.2.0 ⌘

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

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

Title:	⌘ Correction to RANAP RESET procedure		
Source:	⌘ RAN WG3		
Work item code:	⌘ TEI4	Date:	⌘ 18/09/2002
Category:	⌘ A	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 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)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ In R99 TS25.413 specification, <u>the RNC</u> , when the procedure is initiated by the RNC, it must include the <i>Global RNC-ID</i> IE in the RESET message. This is to inform the CN of which RNC is initiating the Reset, and it is needed since this message uses the SCCP connectionless procedure. In Rel-4 and Rel-5 TS 25.413 specifications, the sentence "The RNC shall include the <i>Global RNC-ID</i> IE in the RESET message" has disappeared. However, this information is needed by the CN.
Summary of change:	⌘ The sentence "The RNC shall include the <i>Global RNC-ID</i> IE in the RESET message" is re-introduced in section 8.26.2.2 <u>Impact assessment towards the previous version of the specification (same release):</u> This CR has isolated impact towards the previous version of the specification (same release). This CR has an impact under functional and protocol point of view. The impact can be considered isolated because it only affects the RANAP Reset function. <u>Impact assessment towards the previous release of the specification:</u> This CR is backward compatible with R99 version of the specification.
Consequences if not approved:	⌘ If this CR is not approved, the RNC will not include the <i>Global RNC-ID</i> IE in the RESET message, and the CN node will not be able to know which RNC initiated

the procedure. Moreover, there would be an interoperability problem between a R99 RNC and a Rel-4 CN node, and between a Rel-4 RNC and a R99 CN node.

Clauses affected:	⌘	8.26.2.2										
Other specs affected:	⌘	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ 25.413 v4.6.0 CR516
		Y	N									
		X										
	X											
	X											
		Test specifications										
		O&M Specifications										
Other comments:	⌘											

8.26.2.2 Reset Procedure Initiated from the UTRAN

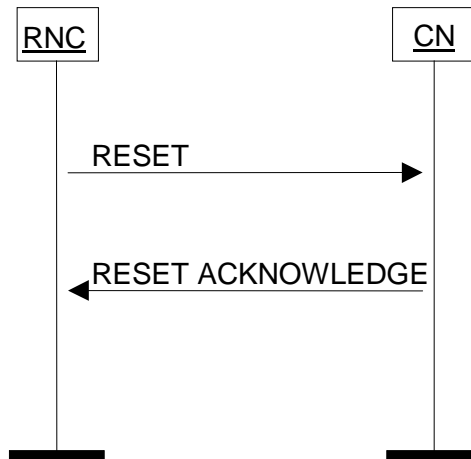


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The RNC shall include the *Global RNC-ID* IE in the RESET message.

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

Interactions with other procedures:

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

CHANGE REQUEST

⌘ **25.413** **CR 521** ⌘ rev **1** ⌘ Current version: **4.6.0** ⌘

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

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

Title:	⌘ Rel4 Common CR after RANAP review		
Source:	⌘ RAN WG3		
Work item code:	⌘ TEI4	Date:	⌘ 14/11/2002
Category:	⌘ F 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.	Release:	⌘ Rel-4 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: ⌘ During RAN3#32, a RANAP Review ad hoc was held where several issues were addressed (see R3-022227). These issues A.3, A.4, B.1, B.5, B.6 and B.8 were discussed during an email discussion in order to prepare a common release 4 CR for RAN3#33. Here are the list of the issues addressed in that CR:

- A.3, it has been clarified in CR463r2 that e.g. the source RNC shall include the same Source RNC to Target RNC Transparent Container IE in the RELOCATION REQUIRED message towards two domains. The same kind of statement is missing for *Relocation Type* IE, *Source ID* IE and *Cause* IE in the RELOCATION REQUIRED message when two domains are involved.
- A.4, in section 8.15.2 and in the following sentence "The *CN Domain Indicator* IE shall be used by the RNC to identify from which CN domain the PAGING message originates" the wording "PAGING message" is not completely correct since at CS paging via SGSN, the CN Domain Indicator shall point to the MSC and not to the SGSN, since the paging response shall be sent directly to the MSC.
- B.1, first in Chapter 8.2.2 of RAB Assignment procedure, the text with regards to the RAB negotiation shall be aligned with the same one in Relocation Resource Allocation procedure. Furthermore the allowed negotiation in case of "Unspecified" in signalled *Type of Alternative Maximum Bit Rate Information* IE (in *Alternative RAB Parameter Values* IE) should be further described.
- B.5, the statement "The procedure uses connection oriented signalling." is missing in section 8.31 for the Location related data procedure.
- B.6, according to the discussion during RAN3#31 about the contribution R3-021932, the cause value 114 "No Resource Available" shall be added in the list in section 8.20.2 of the Location Report procedure.
- B.8, RANAP does not mention anywhere that in case of RAB modification the RNC shall keep the old confirmation as long as the switch to the new one

has not been successfully performed.

Summary of change: ⌘

The above issues are addressed as follows (for further explanations see R3-022277):

- A.3, the procedure text in chapter 8.6.5 should read "The source RNC shall also include the same *Source RNC to Target RNC Transparent Container IE*, *Relocation Type IE*, *Source ID IE* and *Cause IE* in the RELOCATION REQUIRED message towards the two domains."
- A.4, change of the wording "PAGING message" to "paging request".
- B.1, first align the text related to the RAB negotiation in Chapter 8.2.2 of RAB Assignment procedure with the same one in Relocation Resource Allocation and second include in 9.2.1.43 the following for defining the *Type of Alternative Maximum Bit Rate Information IE* and the *Type of Alternative Guaranteed Bit Rate Information IE*: "The RNC is allowed to assign any value equal or below."
- B.5, the statement "The procedure uses connection oriented signalling." is added in section 8.31 for the Location related data procedure.
- B.6, add the cause value 114 "No Resource Available" in the list in section 8.20.2 of the Location Report procedure.
- B.8, mention that the RNC shall keep the old confirmation as long as the switch to the new one has not been successfully performed.

Furthermore the following editorial mistakes are corrected as follows:

- Add the missing wording "the Event IE included in the" in section 8.20.2.
- Re-number the figures that had strange number at the end of section 8 (and figure in section 10.1 accordingly).
- Add the missing "O" for optional for the UL GTP-PDU Sequence Number IE in section 9.1.4.
- Correct the wrong wording "Encryption key" in 8.7.2 to "Ciphering Key".
- Removal of some useless extra space between words.
- Add missing full points at the end of some sentences.

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 of several clarifications to unclear wordings and statements. The CR has an impact under functional point of view.

The impact can be considered isolated because the change is a collection of minor clarifications.

Consequences if not approved: ⌘

RANAP will remain ambiguous in several cases and scenarios identified above. Those ambiguities might lead to different interpretation of the specifications and then to Release 4 multi-vendor interoperability issues.

Clauses affected: ⌘

8.2.2, 8.6.5, 8.7.2, 8.15.2, 8.20.2, 8.31, 9.1.4, 9.2.1.43 and 10.1

Other specs affected:

Y	N
X	
	X
	X

Other core specifications
Test specifications
O&M Specifications

⌘ CR522 25.413 REL-5

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.

8.2.2 Successful Operation

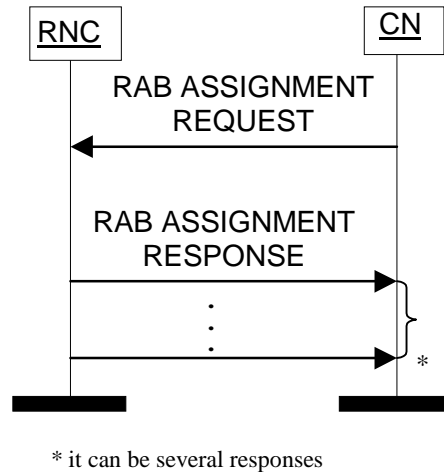


Figure 1: RAB Assignment procedure. Successful operation.

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 Parameters* 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 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 within the *Assigned RAB Parameter Values* IE.

For the CS domain, UTRAN shall report the successful outcome of a specific RAB to establish or modify only after the Iu user plane at RNL level is ready to be used in UL and DL. At a RAB establishment, the transport network control plane signalling required to set up the transport bearer shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification when *Transport Layer Address* IE and *Iu Transport Association* IE is 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* IE is not included, then the RNC may modify the already existing transport bearer.

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 $T_{QUEUING}$.

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".

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

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

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.

8.6.5 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*, *Relocation Type IE*, *Source ID IE* and *Cause 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.

8.7.2 Successful Operation

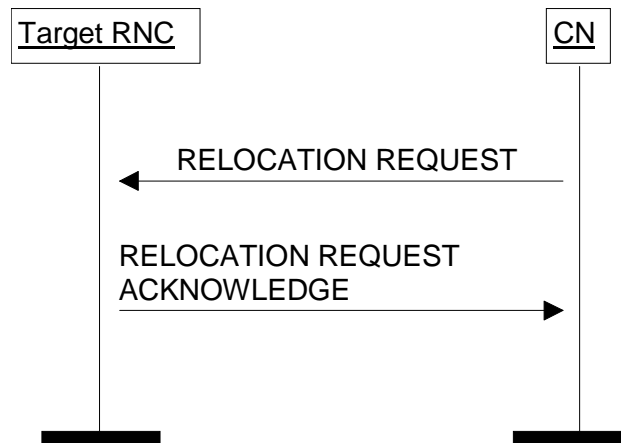


Figure 7: Relocation Resource Allocation procedure. Successful operation.

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

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

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

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

The RELOCATION REQUEST message shall contain following IEs

- *Permanent NAS UE Identity* IE (if available)
- *Cause*
- *CN Domain Indicator*
- *Source RNC To Target RNC Transparent Container*
- *Iu Signalling Connection Identifier*
- *Integrity Protection Information* IE (if available)

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

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

The RELOCATION REQUEST message may include following IEs:

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

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

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

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

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

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

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

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

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN, 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 (~~*Ciphering*~~~~*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 ~~*Ciphering*~~~~*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.

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

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

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

- The target RNC may accept a requested RAB only if the RAB can be supported by the target RNC.
- Other RABs shall be rejected by the target RNC in the RELOCATION REQUEST ACKNOWLEDGE message with an appropriate value for *Cause* IE, e.g. "Unable to Establish During Relocation".
- The target RNC shall include information adapted to the resulting RAB configuration in the target to source RNC transparent container to be included in the RELOCATION REQUEST ACKNOWLEDGE message sent to the CN. If the target RNC supports triggering of the Relocation Detect procedure via the Iur interface, the RNC shall assign a d-RNTI for the context of the relocation and include it in the container. If two CNs are involved in the relocation of SRNS, the target RNC may, however, decide to send the container to only one CN.
- If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the RELOCATION REQUEST ACKNOWLEDGE message within the *Assigned RAB Parameter Values* IE.

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

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

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

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

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

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

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

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

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

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

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

Before reporting the successful outcome of the Relocation Resource allocation procedure, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. If the RNC can not initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the rules for initialisation of the respective user plane mode versions, as described in [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

8.15.2 Successful Operation



Figure 16: Paging procedure. Successful operation.

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

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

The PAGING message may contain following IEs:

- *Temporary UE Identity.*
- *Paging Area.*
- *Paging Cause.*
- *Non Searching Indicator.*

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

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

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

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

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

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

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

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

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

8.20.2 Successful Operation

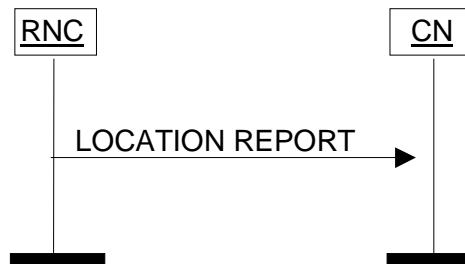


Figure 22: Location Report procedure. Successful operation.

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

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

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

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

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

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

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

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

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or an other type, which fulfils the requested accuracy as accurately as possible. If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE, the reported *Geographical Area* IE may include an accuracy.

8.31 Location Related Data

8.31.1 General

The purpose of the Location Related Data procedure is to provide the means to handle additional Location related requests over the Iu interface: it allows the CN to either retrieve from the RNC deciphering keys (to be forwarded to the UE) for the broadcasted assistance data, or request the RNC to deliver dedicated assistance data to the UE. The procedure uses connection oriented signalling.

8.31.2 Successful Operation

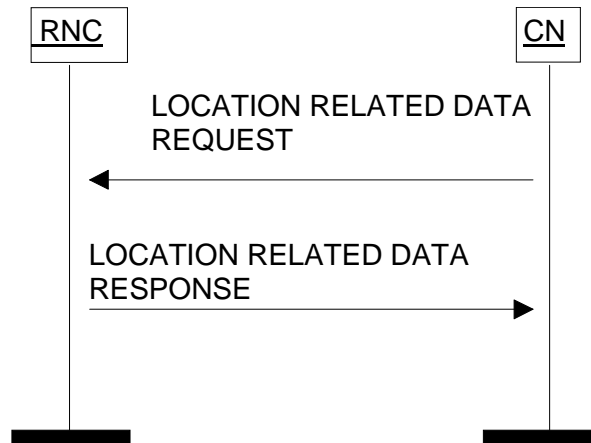


Figure 36A37: Location Related Data procedure. Successful operation.

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

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

The *Location Related Data Request Type* IE shall indicate to the RNC whether:

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

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

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

8.31.3 Unsuccessful Operation

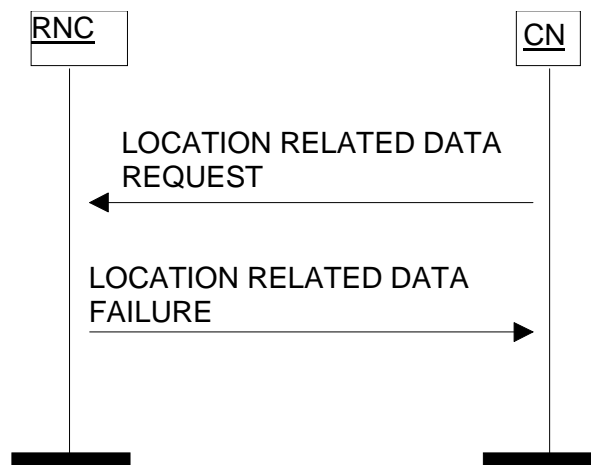


Figure 3738: Location Related Data procedure. Unsuccessful operation.

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

8.31.4 Abnormal Conditions

Not applicable.

9.1.4 RAB ASSIGNMENT RESPONSE

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

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
RABs Setup Or Modified List	O				YES	ignore
>RABs Setup Or Modified Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>Transport Layer Address	O		9.2.2.1		-	
>>lu Transport Association	O		9.2.2.2		-	
>>DL Data Volumes	O				-	
>>>Data Volume List		1 to <maxnoofVol>			-	
>>>>Unsuccessfully Transmitted DL Data Volume	M		9.2.3.12		-	
>>>>Data Volume Reference	O		9.2.3.13		-	
>>Assigned RAB Parameter Values	O		9.2.1.44		YES	ignore
RABs Released List	O				YES	ignore
>RABs Released Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>DL Data Volumes	O				-	
>>>Data Volume List		1 to <maxnoofVol>			-	
>>>>Unsuccessfully Transmitted DL Data Volume	M		9.2.3.12		-	
>>>>Data Volume Reference	O		9.2.3.13		-	
>>DL GTP-PDU Sequence Number	O		9.2.2.3		-	
>>UL GTP-PDU Sequence Number	<u>O</u>		9.2.2.4		-	
RABs Queued List	O				YES	ignore
>RABs Queued Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
RABs Failed To Setup Or Modify List	O				YES	ignore
>RABs Failed To Setup Or Modify Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in	-	

				one group.		
>>Cause	M		9.2.1.4		-	
RABs Failed To Release List	O				YES	ignore
>RABs Failed To Release Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>Cause	M		9.2.1.4.		-	
Criticality Diagnostics	O		9.2.1.35		YES	ignore

Range bound	Explanation
maxnoofRABs	Maximum no. of RABs for one UE. Value is 256.
maxnoofVol	Maximum no. of reported data volume for one RAB. Value is 2.

9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to indicate that RAB QoS negotiation is allowed for certain RAB parameters and in some cases also which alternative values to be used in the negotiation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative RAB parameter values				
>Alternative Maximum Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. <u>the RNC is allowed to assign any value equal or below the ones indicated in the RAB Parameters IE.</u>
>>Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesM BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the RAB Parameters IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
>Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Guaranteed Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. <u>the RNC is allowed to assign any value equal or below the ones indicated in the RAB Parameters IE.</u>
>>Alternative Guaranteed Bit Rates	C ifValueRangeorDiscreteValuesG BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the RAB Parameters IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

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

10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error.
- Abstract Syntax Error.
- Logical Error.

Protocol errors can occur in the following functions within a receiving node:

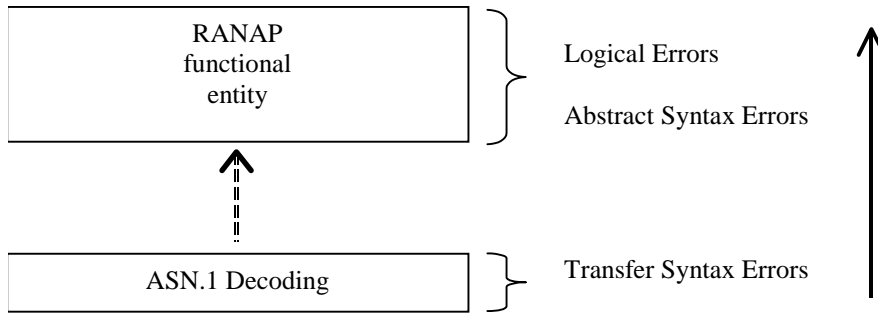


Figure 3839: Protocol Errors in RANAP.

The information stated in subclauses 10.2, 10.3 and 10.4, to be included in the message used when reporting an error, is what at minimum shall be included. Other optional information elements within the message may also be included, if available. This is also valid for the case when the reporting is done with a response message. The latter is an exception to what is stated in subclause 4.1.

CHANGE REQUEST

⌘ **25.413** **CR 522** ⌘ rev **1** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘ Rel4 Common CR after RANAP review		
Source:	⌘ RAN WG3		
Work item code:	⌘ TEI4	Date:	⌘ 14/11/2002
Category:	⌘ A 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.	Release:	⌘ Rel-5 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: ⌘ During RAN3#32, a RANAP Review ad hoc was held where several issues were addressed (see R3-022227). These issues A.3, A.4, B.1, B.5, B.6 and B.8 were discussed during an email discussion in order to prepare a common release 4 CR for RAN3#33. Here are the list of the issues addressed in that CR:

- A.3, it has been clarified in CR463r2 that e.g. the source RNC shall include the same Source RNC to Target RNC Transparent Container IE in the RELOCATION REQUIRED message towards two domains. The same kind of statement is missing for *Relocation Type* IE, *Source ID* IE and *Cause* IE in the RELOCATION REQUIRED message when two domains are involved.
- A.4, in section 8.15.2 and in the following sentence "The *CN Domain Indicator* IE shall be used by the RNC to identify from which CN domain the PAGING message originates" the wording "PAGING message" is not completely correct since at CS paging via SGSN, the CN Domain Indicator shall point to the MSC and not to the SGSN, since the paging response shall be sent directly to the MSC.
- B.1, first in Chapter 8.2.2 of RAB Assignment procedure, the text with regards to the RAB negotiation shall be aligned with the same one in Relocation Resource Allocation procedure. Furthermore the allowed negotiation in case of "Unspecified" in signalled *Type of Alternative Maximum Bit Rate Information* IE (in *Alternative RAB Parameter Values* IE) should be further described.
- B.5, the statement "The procedure uses connection oriented signalling." is missing in section 8.31 for the Location related data procedure.
- B.6, according to the discussion during RAN3#31 about the contribution R3-021932, the cause value 114 "No Resource Available" shall be added in the list in section 8.20.2 of the Location Report procedure.
- B.8, RANAP does not mention anywhere that in case of RAB modification the RNC shall keep the old confirmation as long as the switch to the new one

has not been successfully performed.

Summary of change: ⌘

The above issues are addressed as follows (for further explanations see R3-022277):

- A.3, the procedure text in chapter 8.6.5 should read “The source RNC shall also include the same *Source RNC to Target RNC Transparent Container IE*, *Relocation Type IE*, *Source ID IE* and *Cause IE* in the RELOCATION REQUIRED message towards the two domains.”.
- A.4, change of the wording “PAGING message” to “paging request”.
- B.1, first align the text related to the RAB negotiation in Chapter 8.2.2 of RAB Assignment procedure with the same one in Relocation Resource Allocation and second include in 9.2.1.43 the following for defining the *Type of Alternative Maximum Bit Rate Information IE* and the *Type of Alternative Guaranteed Bit Rate Information IE*: “The RNC is allowed to assign any value equal or below.”.
- B.5, the statement “The procedure uses connection oriented signalling.” is added in section 8.31 for the Location related data procedure.
- B.6, add the cause value 114 "No Resource Available" in the list in section 8.20.2 of the Location Report procedure.
- B.8, mention that the RNC shall keep the old confirmation as long as the switch to the new one has not been successfully performed.

Furthermore the following editorial mistakes are corrected as follows:

- Correct the “altogether” to “altogether” in section 3.1.
- Add the missing wording "the Event IE included in the" in section 8.20.2.
- Re-number the figures that had strange number at the end of section 8 (and figure in section 10.1 accordingly).
- Add the missing "O" for optional for the UL GTP-PDU Sequence Number IE in section 9.1.4.
- Correct the wrong wording “Encryption key” in 8.7.2 to “Ciphering Key”.
- Removal of some useless extra space between words.
- Add missing full points at the end of some sentences.

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 of several clarifications to unclear wordings and statements. The CR has an impact under functional point of view.

The impact can be considered isolated because the change is a collection of minor clarifications.

Consequences if not approved: ⌘

RANAP will remain ambiguous in several cases and scenarios identified above. Those ambiguities might lead to different interpretation of the specifications and then to Release 4 multi-vendor interoperability issues.

Clauses affected: ⌘

3.1, 8.2.2, 8.6.5, 8.7.2, 8.15.2, 8.20.2, 8.31, 8.32, 9.1.4, 9.2.1.43 and 10.1

Other specs affected:

Y	N
X	
	X
	X

Other core specifications
Test specifications
O&M Specifications

⌘ CR521 25.413 REL-4

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.

3.1 Definitions

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

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

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

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

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

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

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

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

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

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

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

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

SRNC-ID: see [3] for definition

S-RNTI: see [3] for definition

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

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

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

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

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

Elementary Procedure: RANAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the RNS and the CN. These Elementary Procedures are defined separately and are intended to be

used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several RANAP EPs together with each other and EPs from other interfaces can be found in reference [4].

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

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

For Class 1 EPs, the types of responses can be as follows:

Successful:

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful:

- A signalling message explicitly indicates that the EP failed.
- On time supervision expiry (i.e. absence of expected response).

Successful and Unsuccessful:

- One signalling message reports both successful and unsuccessful outcome for the different included requests. The response message used is the one defined for successful outcome.

Class 2 EPs are considered always successful.

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

8.2.2 Successful Operation

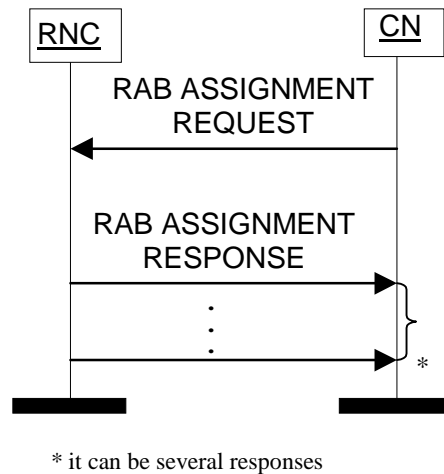


Figure 1: RAB Assignment procedure. Successful operation.

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 Parameters* 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 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 within the *Assigned RAB Parameter Values* IE.

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

For the PS domain or for the CS domain when an ALCAP is not used, 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 $T_{RAB\text{Assgt}}$. 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_{QUEUING} .

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 $T_{RAB\text{Assgt}}$ timer. In case the timer $T_{RAB\text{Assgt}}$ 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".

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

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

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.

8.2.2.1 Successful Operation for GERAN Iu-mode

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

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

8.6.5 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*, *Relocation Type IE*, *Source ID IE* and *Cause 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.

8.7.2 Successful Operation

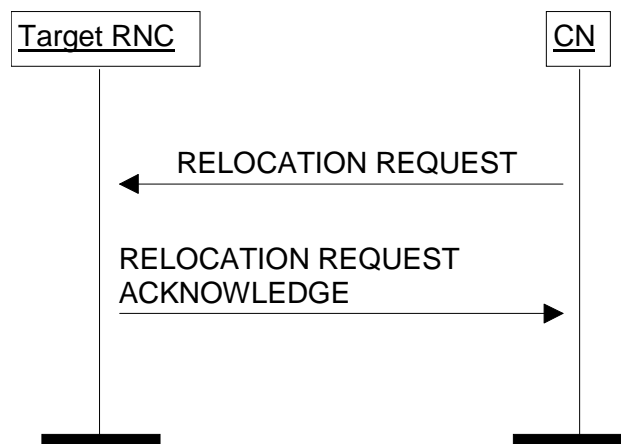


Figure 7: Relocation Resource Allocation procedure. Successful operation.

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

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

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

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

The RELOCATION REQUEST message shall contain following IEs

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

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

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

- *PDP Type Information* (only for PS)

The RELOCATION REQUEST message may include following IEs:

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

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

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

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

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

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

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

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

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN, 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 (~~*Ciphering*~~*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 ~~*Ciphering*~~*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.

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

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

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

- The target RNC may accept a requested RAB only if the RAB can be supported by the target RNC.
- Other RABs shall be rejected by the target RNC in the RELOCATION REQUEST ACKNOWLEDGE message with an appropriate value for *Cause* IE, e.g. "Unable to Establish During Relocation".
- The target RNC shall include information adapted to the resulting RAB configuration in the target to source RNC transparent container to be included in the RELOCATION REQUEST ACKNOWLEDGE message sent to the CN. If the target RNC supports triggering of the Relocation Detect procedure via the Iur interface, the RNC shall assign a d-RNTI for the context of the relocation and include it in the container. If two CNs are involved in the relocation of SRNS, the target RNC may, however, decide to send the container to only one CN.
- If any alternative RAB parameter values have been used when allocating the resources, these RAB parameter values shall be included in the RELOCATION REQUEST ACKNOWLEDGE message within the *Assigned RAB Parameter Values* IE.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Before reporting the successful outcome of the Relocation Resource allocation procedure, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. If the RNC can not initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the rules for initialisation of the respective user plane mode versions, as described in [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

8.7.2.1 Successful Operation for GERAN Iu-mode

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

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

8.15.2 Successful Operation



Figure 16: Paging procedure. Successful operation.

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

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

The PAGING message may contain following IEs:

- *Temporary UE Identity.*
- *Paging Area.*
- *Paging Cause.*
- *Non Searching Indicator.*
- *Global CN-ID.*

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

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

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

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

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

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

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

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

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

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

8.20.2 Successful Operation

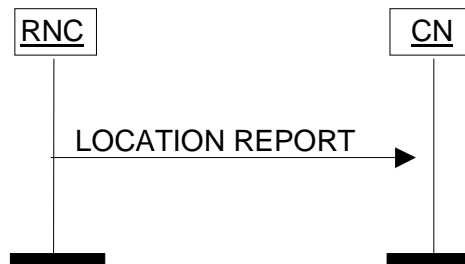


Figure 22: Location Report procedure. Successful operation.

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

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

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

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

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

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

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

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

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or an other type, which fulfils the requested accuracy as accurately as possible. If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE, the reported *Geographical Area* IE may include an accuracy.

8.31 Location Related Data

8.31.1 General

The purpose of the Location Related Data procedure is to provide the means to handle additional Location related requests over the Iu interface: it allows the CN to either retrieve from the RNC deciphering keys (to be forwarded to the UE) for the broadcasted assistance data, or request the RNC to deliver dedicated assistance data to the UE. The procedure uses connection oriented signalling.

8.31.2 Successful Operation

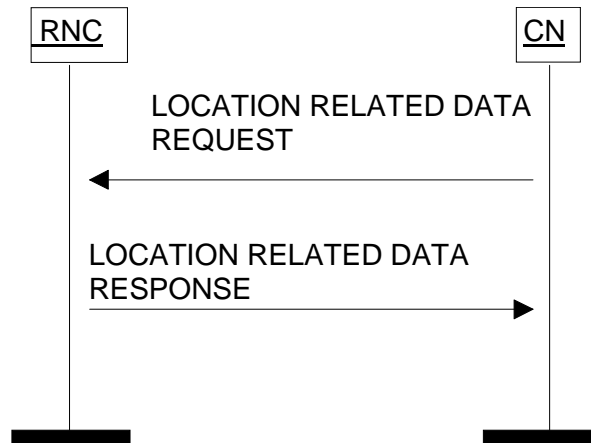


Figure 36A37: Location Related Data procedure. Successful operation.

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

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

The *Location Related Data Request Type IE* shall indicate to the RNC whether:

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

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

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

8.31.2.1 Successful Operation for GERAN Iu mode

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

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

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

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

8.31.3 Unsuccessful Operation

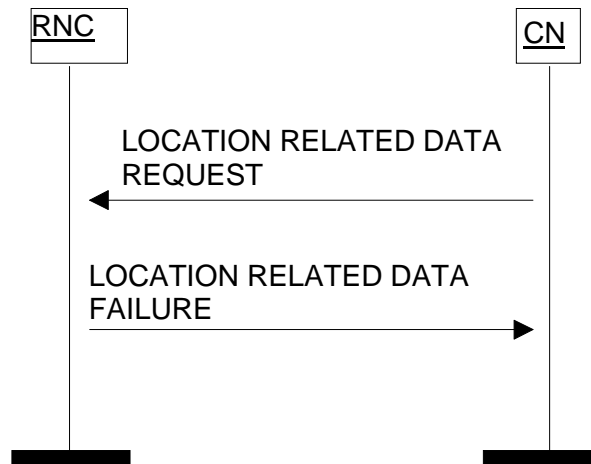


Figure 3738: Location Related Data procedure. Unsuccessful operation.

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

8.31.4 Abnormal Conditions

8.31.4.1 Abnormal Conditions for GERAN Iu mode

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

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

8.32 Information Transfer

8.32.1 General

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

This procedure uses connectionless signalling.

8.32.2 Successful Operation

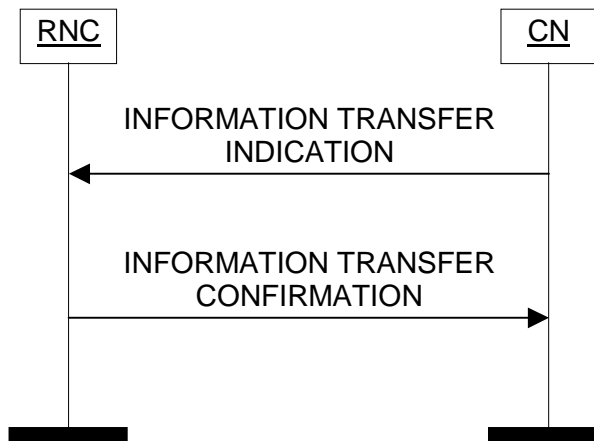


Figure 37a39: Information Transfer procedure. Successful operation.

The procedure is initiated with an INFORMATION TRANSFER INDICATION message sent from the CN to the RNC.

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

Upon reception, the RNC shall store the received information and use it according to its purpose.

The INFORMATION TRANSFER INDICATION message shall contain following IEs:

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

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

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

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

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

8.32.3 Unsuccessful Operation

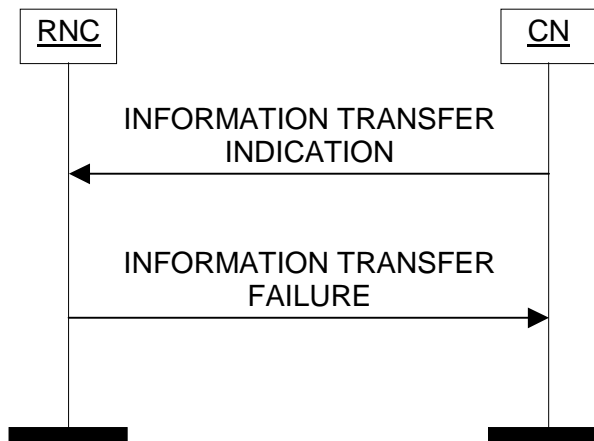


Figure 37b40: Information Transfer procedure. Unsuccessful operation.

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

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

8.32.4 Abnormal Conditions

None.

9.1.4 RAB ASSIGNMENT RESPONSE

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

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
RABs Setup Or Modified List	O				YES	ignore
>RABs Setup Or Modified Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>Transport Layer Address	O		9.2.2.1		-	
>>lu Transport Association	O		9.2.2.2		-	
>>DL Data Volumes	O				-	
>>>Data Volume List		1 to <maxnoofVol>			-	
>>>>Unsuccessfully Transmitted DL Data Volume	M		9.2.3.12		-	
>>>>Data Volume Reference	O		9.2.3.13		-	
>>Assigned RAB Parameter Values	O		9.2.1.44		YES	ignore
RABs Released List	O				YES	ignore
>RABs Released Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>DL Data Volumes	O				-	
>>>Data Volume List		1 to <maxnoofVol>			-	
>>>>Unsuccessfully Transmitted DL Data Volume	M		9.2.3.12		-	
>>>>Data Volume Reference	O		9.2.3.13		-	
>>DL GTP-PDU Sequence Number	O		9.2.2.3		-	
>>UL GTP-PDU Sequence Number	<u>O</u>		9.2.2.4		-	
RABs Queued List	O				YES	ignore
>RABs Queued Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
RABs Failed To Setup Or Modify List	O				YES	ignore
>RABs Failed To Setup Or Modify Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in	-	

				one group.		
>>Cause	M		9.2.1.4		-	
GERAN Iu mode specific RABs Failed To Setup Or Modify List	O			This applies only in GERAN Iu mode case.	YES	ignore
> GERAN Iu mode specific RABs Failed To Setup Or Modify Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>Cause	M		9.2.1.4		-	
>>GERAN Classmark	O		9.2.1.57		-	-
RABs Failed To Release List	O				YES	ignore
>RABs Failed To Release Item IEs		1 to <maxnoofRABs>			EACH	ignore
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>Cause	M		9.2.1.4.		-	
Criticality Diagnostics	O		9.2.1.35		YES	ignore

Range bound	Explanation
maxnoofRABs	Maximum no. of RABs for one UE. Value is 256.
maxnoofVol	Maximum no. of reported data volume for one RAB. Value is 2.

9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to indicate that RAB QoS negotiation is allowed for certain RAB parameters and in some cases also which alternative values to be used in the negotiation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative RAB parameter values				
>Alternative Maximum Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. <u>the RNC is allowed to assign any value equal or below the ones indicated in the RAB Parameters IE.</u>
>>Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesM BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the RAB Parameters IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
>Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Guaranteed Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. <u>the RNC is allowed to assign any value equal or below the ones indicated in the RAB Parameters IE.</u>
>>Alternative Guaranteed Bit Rates	C ifValueRangeorDiscreteValuesG BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the RAB Parameters IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

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

10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error.
- Abstract Syntax Error.
- Logical Error.

Protocol errors can occur in the following functions within a receiving node:

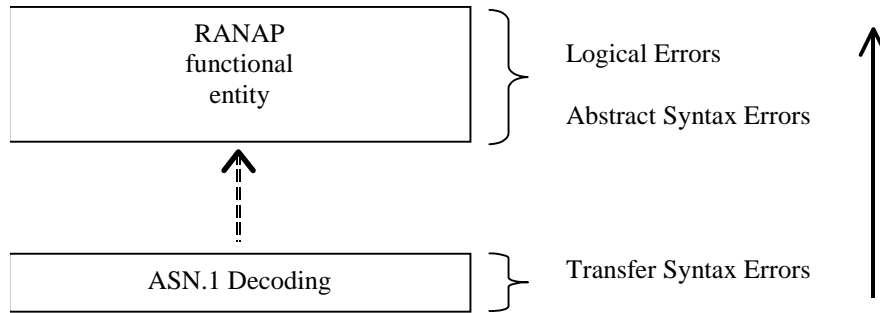


Figure 3841: Protocol Errors in RANAP.

The information stated in subclauses 10.2, 10.3 and 10.4, to be included in the message used when reporting an error, is what at minimum shall be included. Other optional information elements within the message may also be included, if available. This is also valid for the case when the reporting is done with a response message. The latter is an exception to what is stated in subclause 4.1.

CHANGE REQUEST

⌘ **25.413** **CR 525** ⌘ rev **2** ⌘ Current version: **4.6.0** ⌘

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

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

Title:	⌘ Correction to enable Rel4 extensions in Location Reporting Control procedure.		
Source:	⌘ RAN WG3		
Work item code:	⌘ TEI4	Date:	⌘ 14/11/2002
Category:	⌘ F Use <u>one</u> of the following categories: A (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-4 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:	⌘ During RAN3#32, a RANAP Review ad hoc was held where a new issue was raised (see R3-022277). This issue B.9 was also discussed during an email discussion in order to prepare CRs for RAN3#33. Release 4 support of extended positioning in RANAP was approved at RAN3#23 in CR R3-012626 (revision 7!), based on the email discussion report in R3-012322. This CR introduced some new Rel4 IEs after the ellipsis notation in the SEQUENCE Type <i>Request Type</i> IE in the LOCATION REPORTING CONTROL message. However TR 25.921 in section 10.5.1 recommends that adding New IEs or IE groups should be achieved by using the protocol extension container and not by using the ellipsis notation for adding at the top level of message and adding in the SEQUENCE type. Indeed nothing mandates nor restricts an ASN.1 decoder implementation to behave according to one of the two opposite behaviors in the following scenario: - R4 Sept02 CN LOCATION REPORTING CONTROL -> R99 RNC: either skip those unknown Rel4 IEs received after the ellipsis notation (succesfull R99 treatment of the message) or ignore the whole Request Type IE because not fully comprehended (logical error, procedure rejected). Furthermore in the scenario of a R99 CN LOCATION REPORTING CONTROL sent to R4 Sept02 RNC, the RNC will be expecting those Rel4 IEs depending on their conditions and therefore when the conditions are true, we will always have an abstract syntax error that will end up in ignoring the whole Request Type IE (logical error, procedure rejected).
Summary of change:	⌘ The Rel4 <i>Vertical Accuracy Code, Positioning Priority, Response Time</i> and <i>Client Type</i> IEs are moved to a new <i>Request Type Extension</i> IE introduced in the extension container at the top level of the LOCATION REPORTING CONTROL message.

The procedure text of the Location Reporting Control procedure is completed accordingly.

Finally, as a combined CR, this CR covers also the clarification of the issue B.2 (see R3-022277) and therefore adds the wording "the value refers to [x1]" in the semantic description for the *Positioning Priority* IE and *Response time* IE with [x1] as a new reference to 22.071 in RANAP in order to have a pointer towards the meaning of the values of those IEs.

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 of change in the content (ASN.1) of the LOCATION REPORTING CONTROL message.

The CR has an impact under protocol and functional point of view.

The impact can be considered isolated because the change affects the Location Reporting Control function.

It should be noted that this CR introduces a not backward compatible change compared to previous Rel4 version of RANAP specification, as shown in the following scenarios:

R4 Sept02 CN LOCATION REPORTING CONTROL -> R4 Dec02 RNC: it does not work for ASN.1 decoder implementation not capable of skipping those unknown IEs received after the ellipsis notation. It works otherwise in R99 manner.

R4 Dec02 CN LOCATION REPORTING CONTROL -> R4 Sept02 RNC: it does not work at all.

Consequences if not approved:

- ⌘ If Rel4 CNs and RNCs are not upgraded based on that CR, the R99 Location Reporting Control function does not work at all in the following cases:
 - R99 CN LOCATION REPORTING CONTROL -> R4 Sept02 RNC
 - R4 Sept02 CN LOCATION REPORTING CONTROL -> R99 RNC for ASN.1 decoder implementation not capable of skipping those unknown IEs received after the ellipsis notation.

It should be noted that this CR is not backward compatible change compared to previous Rel4 version of RANAP specification in order to enable forward compatibility with R99 functionality and R99 nodes.

Clauses affected: ⌘ 2, 8.19.2, 9.1.29, 9.2.1.16, 9.2.1.x2 (new), 9.3.3, 9.3.4 and 9.3.6

Other specs affected:

Y	N		
X		Other core specifications	⌘ CR526 25.413 REL-5
	X	Test specifications	
	X	O&M Specifications	

Other comments:

- ⌘ Suggestions for new numbers:
 - new reference number in Rel4, x1=26
 - new section number in Rel4, 9.2.1.x2=9.2.1.46a

How to create CRs using this form:

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

Below is a brief summary:

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

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply".
- For a non-specific reference, the latest version applies".

- [1] 3GPP TR 23.930: "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 08.08: "Mobile services Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".
- [12] 3GPP TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".
- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".
- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[25] 3GPP TS 12.20: "Base Station System (BSS) management information".

[x1] 3GPP TS 22.071: "Location Services (LCS); Service description - Stage 1".

8.19.2 Successful Operation



Figure 21: Location Reporting Control procedure. Successful operation.

The CN shall initiate the procedure by generating a LOCATION REPORTING CONTROL message.

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

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

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

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

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy. If the *Vertical Accuracy Code* IE is included in the *Request Type Extension* IE, the *Accuracy Code* IE in the *Request Type* IE shall be present and understood as the *Horizontal Accuracy Code*, ~~response time, priority and the client type~~.

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

The LOCATION REPORTING CONTROL may contain the *Request Type Extension* IE. If this IE is included, it shall contain information about:

- Vertical Accuracy Code (if available),
- Response time (only in connection with request for start of direct reporting of Geographical Area),
- Positioning Priority (only in connection with request for start of direct reporting or in connection with request for start of reporting upon change of Service Area),
- Client Type (only in connection with request for start of direct reporting).

Interaction with Relocation:

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

9.1.29 LOCATION REPORTING CONTROL

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

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	ignore
Request Type	M		9.2.1.16		YES	ignore
Request Type Extension	O		9.2.1.x2		YES	ignore

9.2.1 Radio Network Layer Related IEs

Lots of unaffected parts in 9.2.1 not shown

9.2.1.16 Request Type

This element indicates the type of UE location to be reported from RNC and it is either a Service Area or Geographical Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Request Type				
>Event	M		ENUMERATED(Stop Change of service area, Direct, Change of service area, ..., Stop Direct)	
>Report Area	M		ENUMERATED(Service Area, Geographical Area, ...)	When the Event IE is set to "Stop Change of service area" or to "Stop Direct", the value of the Report area IE shall be the same as in the LOCATION REPORTING CONTROL message that initiated the location reporting.
>Horizontal Accuracy Code	O		INTEGER(0..127)	The requested accuracy "r" is derived from the "accuracy code" k by $r = 10 \times (1.1^k - 1)$. When the <i>Vertical Accuracy Code</i> IE is present in the <i>Request Type Extension</i> IE, this IE shall be present as well and it defines the Horizontal Accuracy Code.
>Vertical Accuracy Code	O		INTEGER(0..127)	The requested accuracy "v" is derived from the "accuracy code" k by $v = 45 \times (1.025^k - 1)$.
>Response time	C IfDirect&GeoAreaReportArea		ENUMERATED (Low-Delay, Delay-Tolerant, ...)	
>Positioning Priority	C ifDirect&ChangeArea		ENUMERATED(High-Priority, Normal-Priority, ...)	
>Client type	C – ifDirect		ENUMERATED(Emergency Services, Value Added Services, PLMN Operator Services, Lawful Intercept Services, ..., PLMN Operator –broadcast services, PLMN Operator –O&M, PLMN Operator –anonymous statistics, PLMN Operator –Target MS service support)	Identifies the type of client

Condition	Explanation
IfDirect&GeoAreaReportArea	This IE shall be present if the <i>Event</i> IE is set to 'Direct' and the <i>Report Area</i> IE is set to 'Geographical Area'.
IfDirect	This IE shall be present if the <i>Event</i> IE is set to 'Direct'.
IfDirect&ChangeArea	This IE shall be present if the <i>Event</i> IE is set to 'Direct' or "Change of Service Area".

Lots of unaffected parts in 9.2.1 not shown

9.2.1.46 Global CN-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global CN-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>CN-ID	M		INTEGER (0..4095)	

9.2.1.x2 Request Type Extension

This element includes additional information about the location request.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
Request Type Extension				
>Vertical Accuracy Code	O		INTEGER(0..127)	The requested accuracy "v" is derived from the "accuracy code" k by $v = 45x(1.025^k - 1)$.
>Response time	C – IfDirect&GeoAreaReportArea		ENUMERATED (Low Delay, Delay Tolerant, ...)	The value refers to [x1].
>Positioning Priority	C – ifDirect&ChangeArea		ENUMERATED(High Priority, Normal Priority, ...)	The value refers to [x1].
>Client type	C – ifDirect		ENUMERATED(Emergency Services, Value Added Services, PLMN Operator Services, Lawful Intercept Services, ..., PLMN Operator - broadcast services, PLMN Operator - O&M, PLMN Operator - anonymous statistics, PLMN Operator - Target MS service support)	Identifies the type of client.

<u>Condition</u>	<u>Explanation</u>
IfDirect&GeoAreaReportArea	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct' and the <i>Report Area</i> IE included in the <i>Request Type</i> IE is set to 'Geographical Area'.
IfDirect	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct'.
IfDirect&ChangeArea	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct' or "Change of Service Area".

9.3.3 PDU Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
BroadcastAssistanceDataDecipheringKeys,
LocationRelatedDataRequestType,
DataVolumeReference,
AreaIdentity,
CN-DomainIndicator,
Cause,
CriticalityDiagnostics,
ChosenEncryptionAlgorithm,
ChosenIntegrityProtectionAlgorithm,
ClassmarkInformation2,
ClassmarkInformation3,
DL-GTP-PDU-SequenceNumber,
DL-N-PDU-SequenceNumber,
DataVolumeReportingIndication,
DRX-CycleLengthCoefficient,
EncryptionInformation,
GlobalCN-ID,
GlobalRNC-ID,
IntegrityProtectionInformation,
IuSignallingConnectionIdentifier,
IuTransportAssociation,
KeyStatus,
L3-Information,
LAI,
LastKnownServiceArea,
NAS-PDU,
NAS-SynchronisationIndicator,
NonSearchingIndication,

```

```

NumberOfSteps,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
RequestTypeExtension,
Requested-RAB-Parameter-Values,
SAI,
SAPI,
Service-Handover,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,
UE-ID,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
Alt-RAB-Parameters,
Ass-RAB-Parameters
FROM RANAP-IEs

```

```

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

```

```

maxNrOfDTs,
maxNrOfErrors,
maxNrOfIuSigConIds,
maxNrOfRABs,

```

maxNrOfVol,

id-AreaIdentity,
id-Alt-RAB-Parameters,
id-Ass-RAB-Parameters,
id-BroadcastAssistanceDataDecipheringKeys,
id-LocationRelatedDataRequestType,
id-CN-DomainIndicator,
id-Cause,
id-ChosenEncryptionAlgorithm,
id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalCN-ID,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConID,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,


```

id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-RequestTypeExtension,
id-SAI,
id-SAPI,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown
--

```

-- *****
--
-- LOCATION REPORTING CONTROL ELEMENTARY PROCEDURE
--
-- *****

```

```

-- *****
--
-- Location Reporting Control
--
-- *****

LocationReportingControl ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {LocationReportingControlIEs} },
    protocolExtensions ProtocolExtensionContainer { {LocationReportingControlExtensions} } OPTIONAL,
    ...
}

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

LocationReportingControlExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enhance the location request over Iu --
{ ID id-RequestTypeExtension    CRITICALITY ignore  EXTENSION RequestTypeExtension    PRESENCE optional },
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown
--

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
```

Lots of unaffected ASN1 in 9.3.4 not shown

```
RequestType ::= SEQUENCE {
    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'.
}

RequestTypeExtension ::= SEQUENCE {
  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 included in the Request Type IE is set to 'Direct' and the Report Area IE included in the Request
  Type IE is set to 'Geographical Area'.
  positioningPriority        PositioningPriority OPTIONAL,
  -- This IE shall be present if the Event IE included in the Request Type IE is set to 'Direct' or "Change of Service Area".
  clientType                ClientType      OPTIONAL
  -- This IE shall be present if the Event IE included in the Request Type 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,
  ...
}

```

Lots of unaffected ASN1 in 9.3.4 not shown

9.3.6 Constant Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

```

```

id-LocationRelatedData          INTEGER ::= 30

-- *****
--
-- 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
maxNrOfAltValues                INTEGER ::= 16

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

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

id-AreaIdentity                  INTEGER ::= 0
id-CN-DomainIndicator           INTEGER ::= 3
id-Cause                        INTEGER ::= 4
id-ChosenEncryptionAlgorithm     INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2        INTEGER ::= 7
id-ClassmarkInformation3        INTEGER ::= 8
id-CriticalityDiagnostics       INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber    INTEGER ::= 10
id-EncryptionInformation        INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation       INTEGER ::= 13
id-L3-Information               INTEGER ::= 14
id-LAI                          INTEGER ::= 15

```

id-NAS-PDU	INTEGER ::= 16
id-NonSearchingIndication	INTEGER ::= 17
id-NumberOfSteps	INTEGER ::= 18
id-OMC-ID	INTEGER ::= 19
id-OldBSS-ToNewBSS-Information	INTEGER ::= 20
id-PagingAreaID	INTEGER ::= 21
id-PagingCause	INTEGER ::= 22
id-PermanentNAS-UE-ID	INTEGER ::= 23
id-RAB-ContextItem	INTEGER ::= 24
id-RAB-ContextList	INTEGER ::= 25
id-RAB-DataForwardingItem	INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq	INTEGER ::= 27
id-RAB-DataForwardingList	INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq	INTEGER ::= 29
id-RAB-DataVolumeReportItem	INTEGER ::= 30
id-RAB-DataVolumeReportList	INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem	INTEGER ::= 32
id-RAB-DataVolumeReportRequestList	INTEGER ::= 33
id-RAB-FailedItem	INTEGER ::= 34
id-RAB-FailedList	INTEGER ::= 35
id-RAB-ID	INTEGER ::= 36
id-RAB-QueuedItem	INTEGER ::= 37
id-RAB-QueuedList	INTEGER ::= 38
id-RAB-ReleaseFailedList	INTEGER ::= 39
id-RAB-ReleaseItem	INTEGER ::= 40
id-RAB-ReleaseList	INTEGER ::= 41
id-RAB-ReleasedItem	INTEGER ::= 42
id-RAB-ReleasedList	INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp	INTEGER ::= 44
id-RAB-RelocationReleaseItem	INTEGER ::= 45
id-RAB-RelocationReleaseList	INTEGER ::= 46
id-RAB-SetupItem-RelocReq	INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck	INTEGER ::= 48
id-RAB-SetupList-RelocReq	INTEGER ::= 49
id-RAB-SetupList-RelocReqAck	INTEGER ::= 50
id-RAB-SetupOrModifiedItem	INTEGER ::= 51
id-RAB-SetupOrModifiedList	INTEGER ::= 52
id-RAB-SetupOrModifyItem	INTEGER ::= 53
id-RAB-SetupOrModifyList	INTEGER ::= 54
id-RAC	INTEGER ::= 55
id-RelocationType	INTEGER ::= 56
id-RequestType	INTEGER ::= 57
id-SAI	INTEGER ::= 58
id-SAPI	INTEGER ::= 59
id-SourceID	INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer	INTEGER ::= 61
id-TargetID	INTEGER ::= 62
id-TargetRNC-ToSourceRNC-TransparentContainer	INTEGER ::= 63
id-TemporaryUE-ID	INTEGER ::= 64
id-TraceReference	INTEGER ::= 65
id-TraceType	INTEGER ::= 66
id-TransportLayerAddress	INTEGER ::= 67
id-TriggerID	INTEGER ::= 68

id-UE-ID	INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber	INTEGER ::= 70
id-RAB-FailedtoReportItem	INTEGER ::= 71
id-RAB-FailedtoReportList	INTEGER ::= 72
id-KeyStatus	INTEGER ::= 75
id-DRX-CycleLengthCoefficient	INTEGER ::= 76
id-IuSigConIdList	INTEGER ::= 77
id-IuSigConIdItem	INTEGER ::= 78
id-IuSigConId	INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf	INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf	INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf	INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf	INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem	INTEGER ::= 84
id-RAB-ContextFailedtoTransferList	INTEGER ::= 85
id-GlobalRNC-ID	INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp	INTEGER ::= 87
id-MessageStructure	INTEGER ::= 88
id-Alt-RAB-Parameters	INTEGER ::= 89
id-Ass-RAB-Parameters	INTEGER ::= 90
id-RAB-ModifyList	INTEGER ::= 91
id-RAB-ModifyItem	INTEGER ::= 92
id-TypeOfError	INTEGER ::= 93
id-BroadcastAssistanceDataDecipheringKeys	INTEGER ::= 94
id-LocationRelatedDataRequestType	INTEGER ::= 95
id-GlobalCN-ID	INTEGER ::= 96
id-LastKnownServiceArea	INTEGER ::= 97
id-RequestTypeExtension	INTEGER ::= 99

END

CR-Form-v7

CHANGE REQUEST

⌘ **25.413** **CR 526** ⌘ rev **2** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘ Correction to enable Rel4 extensions in Location Reporting Control procedure.		
Source:	⌘ RAN WG3		
Work item code:	⌘ TEI4	Date:	⌘ 14/11/2002
Category:	⌘ A 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.	Release:	⌘ Rel-5 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:	⌘ During RAN3#32, a RANAP Review ad hoc was held where a new issue was raised (see R3-022277). This issue B.9 was also discussed during an email discussion in order to prepare CRs for RAN3#33. Release 4 support of extended positioning in RANAP was approved at RAN3#23 in CR R3-012626 (revision 7!), based on the email discussion report in R3-012322. This CR introduced some new Rel4 IEs after the ellipsis notation in the SEQUENCE Type <i>Request Type</i> IE in the LOCATION REPORTING CONTROL message. However TR 25.921 in section 10.5.1 recommends that adding New IEs or IE groups should be achieved by using the protocol extension container and not by using the ellipsis notation for adding at the top level of message and adding in the SEQUENCE type. Indeed nothing mandates nor restricts an ASN.1 decoder implementation to behave according to one of the two opposite behaviors in the following scenario: - R4 Sept02 CN LOCATION REPORTING CONTROL -> R99 RNC: either skip those unknown Rel4 IEs received after the ellipsis notation (succesfull R99 treatment of the message) or ignore the whole Request Type IE because not fully comprehended (logical error, procedure rejected). Furthermore in the scenario of a R99 CN LOCATION REPORTING CONTROL sent to R4 Sept02 RNC, the RNC will be expecting those Rel4 IEs depending on their conditions and therefore when the conditions are true, we will always have an abstract syntax error that will end up in ignoring the whole Request Type IE (logical error, procedure rejected).
Summary of change:	⌘ The Rel4 <i>Vertical Accuracy Code, Positioning Priority, Response Time and Client Type</i> IEs are moved to a new <i>Request Type Extension</i> IE introduced in the extension container at the top level of the LOCATION REPORTING CONTROL message.

The procedure text of the Location Reporting Control procedure is completed accordingly.

Finally, as a combined CR, this CR covers also the clarification of the issue B.2 (see R3-022277) and therefore adds the wording "the value refers to [x1]" in the semantic description for the *Positioning Priority* IE and *Response time* IE with [x1] as a new reference to 22.071 in RANAP in order to have a pointer towards the meaning of the values of those IEs.

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 of change in the content (ASN.1) of the LOCATION REPORTING CONTROL message.

The CR has an impact under protocol and functional point of view.

The impact can be considered isolated because the change affects the Location Reporting Control function.

It should be noted that this CR introduces a not backward compatible change compared to previous Rel4 version of RANAP specification, as shown in the following scenarios:

R4 Sept02 CN LOCATION REPORTING CONTROL -> R4 Dec02 RNC: it does not work for ASN.1 decoder implementation not capable of skipping those unknown IEs received after the ellipsis notation. It works otherwise in R99 manner.

R4 Dec02 CN LOCATION REPORTING CONTROL -> R4 Sept02 RNC: it does not work at all.

Consequences if not approved:

- ⌘ If Rel4 CNs and RNCs are not upgraded based on that CR, the R99 Location Reporting Control function does not work at all in the following cases:
 - R99 CN LOCATION REPORTING CONTROL -> R4 Sept02 RNC
 - R4 Sept02 CN LOCATION REPORTING CONTROL -> R99 RNC for ASN.1 decoder implementation not capable of skipping those unknown IEs received after the ellipsis notation.

It should be noted that this CR is not backward compatible change compared to previous Rel4 version of RANAP specification in order to enable forward compatibility with R99 functionality and R99 nodes.

Clauses affected: ⌘ 2, 8.19.2, 9.1.29, 9.2.1.16, 9.2.1.x2 (new), 9.3.3, 9.3.4 and 9.3.6

Other specs affected:

Y	N		⌘
X		Other core specifications	CR525 25.413 REL-4
	X	Test specifications	
	X	O&M Specifications	

Other comments:

- ⌘ Suggestions for new numbers:
 - new reference number in Rel5, x1=30
 - new section number in Rel5, 9.2.1.x2=9.2.1.46a

How to create CRs using this form:

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

Below is a brief summary:

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

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply".
- For a non-specific reference, the latest version applies".

- [1] 3GPP TR 23.930: "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 48.008: "3rd Generation Partnership Project (3GPP) Technical Specification Group GSM EDGE Radio Access Network; Mobile-services Switching Centre – Base Station System (MSC - BSS) interface; Layer 3 specification".
- [12] 3GPP TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".
- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [25] 3GPP TS 12.20: "Base Station System (BSS) management information".
- [26] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".
- [27] 3GPP TS 43.051: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Overall description - Stage 2".
- [28] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services (LCS) in UTRAN".
- [29] 3GPP TS 43.059: "Functional stage 2 description of Location Services (LCS) in GERAN".
- [x1] 3GPP TS 22.071: "Location Services (LCS); Service description - Stage 1".

8.19.2 Successful Operation



Figure 21: Location Reporting Control procedure. Successful operation.

The CN shall initiate the procedure by generating a LOCATION REPORTING CONTROL message.

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

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

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

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

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy. If the *Vertical Accuracy Code* IE is included in the *Request Type Extension* IE, the *Accuracy Code* IE in the *Request Type* IE shall be present and understood as the *Horizontal Accuracy Code*, ~~response time, priority and the client type~~.

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

The LOCATION REPORTING CONTROL may contain the *Request Type Extension* IE. If this IE is included, it shall contain information about:

- Vertical Accuracy Code (if available),
- Response time (only in connection with request for start of direct reporting of Geographical Area),
- Positioning Priority (only in connection with request for start of direct reporting or in connection with request for start of reporting upon change of Service Area),
- Client Type (only in connection with request for start of direct reporting).

Interaction with Relocation:

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

9.1.29 LOCATION REPORTING CONTROL

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

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	ignore
Request Type	M		9.2.1.16		YES	ignore
Request Type Extension	O		9.2.1.x2		YES	ignore

9.2.1 Radio Network Layer Related IEs

Lots of unaffected parts in 9.2.1 not shown

9.2.1.16 Request Type

This element indicates the type of UE location to be reported from RNC and it is either a Service Area or Geographical Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Request Type				
>Event	M		ENUMERATED(Stop Change of service area, Direct, Change of service area, ..., Stop Direct)	
>Report Area	M		ENUMERATED(Service Area, Geographical Area, ...)	When the Event IE is set to "Stop Change of service area" or to "Stop Direct", the value of the Report area IE shall be the same as in the LOCATION REPORTING CONTROL message that initiated the location reporting.
>Horizontal Accuracy Code	O		INTEGER(0..127)	The requested accuracy "r" is derived from the "accuracy code" k by $r = 10 \times (1.1^k - 1)$. When the <i>Vertical Accuracy Code</i> IE is present in the <i>Request Type Extension</i> IE, this IE shall be present as well and it defines the Horizontal Accuracy Code.
>Vertical Accuracy Code	O		INTEGER(0..127)	The requested accuracy "v" is derived from the "accuracy code" k by $v = 45 \times (1.025^k - 1)$.
>Response time	C IfDirect&GeoAreaReportArea		ENUMERATED (Low-Delay, Delay-Tolerant, ...)	
>Positioning Priority	C ifDirect&ChangeArea		ENUMERATED(High-Priority, Normal-Priority, ...)	
>Client type	C – ifDirect		ENUMERATED(Emergency Services, Value Added Services, PLMN Operator Services, Lawful Intercept Services, ..., PLMN Operator –broadcast services, PLMN Operator –O&M, PLMN Operator –anonymous statistics, PLMN Operator –Target MS service support)	Identifies the type of client

Condition	Explanation
IfDirect&GeoAreaReportArea	This IE shall be present if the <i>Event</i> IE is set to 'Direct' and the <i>Report Area</i> IE is set to 'Geographical Area'.
IfDirect	This IE shall be present if the <i>Event</i> IE is set to 'Direct'.
IfDirect&ChangeArea	This IE shall be present if the <i>Event</i> IE is set to 'Direct' or "Change of Service Area".

Lots of unaffected parts in 9.2.1 not shown

9.2.1.46 Global CN-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global CN-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>CN-ID	M		INTEGER (0..4095)	

9.2.1.x2 Request Type Extension

This element includes additional information about the location request.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
Request Type Extension				
>Vertical Accuracy Code	O		INTEGER(0..127)	The requested accuracy "v" is derived from the "accuracy code" k by $v = 45x(1.025^k - 1)$.
>Response time	C – IfDirect&GeoAreaReportArea		ENUMERATED (Low Delay, Delay Tolerant, ...)	The value refers to [x1].
>Positioning Priority	C – ifDirect&ChangeArea		ENUMERATED(High Priority, Normal Priority, ...)	The value refers to [x1].
>Client type	C – ifDirect		ENUMERATED(Emergency Services, Value Added Services, PLMN Operator Services, Lawful Intercept Services, ..., PLMN Operator - broadcast services, PLMN Operator - O&M, PLMN Operator - anonymous statistics, PLMN Operator - Target MS service support)	Identifies the type of client.

<u>Condition</u>	<u>Explanation</u>
IfDirect&GeoAreaReportArea	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct' and the <i>Report Area</i> IE included in the <i>Request Type</i> IE is set to 'Geographical Area'.
IfDirect	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct'.
IfDirect&ChangeArea	This IE shall be present if the <i>Event</i> IE included in the <i>Request Type</i> IE is set to 'Direct' or "Change of Service Area".

9.2.1.47 New BSS to Old BSS Information

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

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

Lots of unaffected parts in 9.2.1 not shown

9.3.3 PDU Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GERAN-BSC-Container,
    GERAN-Classmark,
    GlobalCN-ID,
    GlobalRNC-ID,
    InformationTransferID,
    IntegrityProtectionInformation,
    InterSystemInformation-TransparentContainer,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
```

```

L3-Information,
LAI,
LastKnownServiceArea,
NAS-PDU,
NAS-SynchronisationIndicator,
NewBSS-To-OldBSS-Information,
NonSearchingIndication,
NumberOfSteps,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
ProvidedData,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
RequestTypeExtension,
Requested-RAB-Parameter-Values,
RRC-Container,
SAI,
SAPI,
Service-Handover,
SNA-Access-Information,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,
UE-ID,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
Alt-RAB-Parameters,
Ass-RAB-Parameters
FROM RANAP-IEs

```

```

PrivateIE-Container{},
ProtocolExtensionContainer{},
ProtocolIE-ContainerList{},
ProtocolIE-ContainerPair{},
ProtocolIE-ContainerPairList{},
ProtocolIE-Container{}

```

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

id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-ProvidedData,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-RequestTypeExtension,
id-SAI,
id-SAPI,
id-SNA-Access-Information,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,

```

id-SourceRNC-PDCP-context-info,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- LOCATION REPORTING CONTROL ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Location Reporting Control
--
-- *****

LocationReportingControl ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {LocationReportingControlIEs} },
    protocolExtensions   ProtocolExtensionContainer { {LocationReportingControlExtensions} }    OPTIONAL,
    ...
}

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

LocationReportingControlExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-RequestTypeExtension CRITICALITY ignore  EXTENSION RequestTypeExtension PRESENCE optional },
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

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,
    maxNrOfSNAs,
    maxNrOfLAs,
    maxNrOfPLMNSs,

    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

```

Lots of unaffected ASN1 in 9.3.4 not shown


```

RequestType ::= SEQUENCE {
    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'.
}

RequestTypeExtension ::= SEQUENCE {
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 included in the Request Type IE is set to 'Direct' and the Report Area IE included in the Request
Type IE is set to 'Geographical Area'. --
positioningPriority  PositioningPriority  OPTIONAL,
-- This IE shall be present if the Event IE included in the Request Type IE is set to 'Direct' or "Change of Service Area". --
clientType         ClientType  OPTIONAL
-- This IE shall be present if the Event IE included in the Request Type 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,
    ...
}

```

Lots of unaffected ASN1 in 9.3.4 not shown

9.3.6 Constant Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

```

```

id-LocationRelatedData          INTEGER ::= 30
id-InformationTransfer           INTEGER ::= 31

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

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

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

id-AreaIdentity                 INTEGER ::= 0
id-CN-DomainIndicator           INTEGER ::= 3
id-Cause                        INTEGER ::= 4
id-ChosenEncryptionAlgorithm    INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2        INTEGER ::= 7
id-ClassmarkInformation3        INTEGER ::= 8
id-CriticalityDiagnostics       INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber    INTEGER ::= 10
id-EncryptionInformation        INTEGER ::= 11

```

id-IntegrityProtectionInformation	INTEGER ::= 12
id-IuTransportAssociation	INTEGER ::= 13
id-L3-Information	INTEGER ::= 14
id-LAI	INTEGER ::= 15
id-NAS-PDU	INTEGER ::= 16
id-NonSearchingIndication	INTEGER ::= 17
id-NumberOfSteps	INTEGER ::= 18
id-OMC-ID	INTEGER ::= 19
id-OldBSS-ToNewBSS-Information	INTEGER ::= 20
id-PagingAreaID	INTEGER ::= 21
id-PagingCause	INTEGER ::= 22
id-PermanentNAS-UE-ID	INTEGER ::= 23
id-RAB-ContextItem	INTEGER ::= 24
id-RAB-ContextList	INTEGER ::= 25
id-RAB-DataForwardingItem	INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq	INTEGER ::= 27
id-RAB-DataForwardingList	INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq	INTEGER ::= 29
id-RAB-DataVolumeReportItem	INTEGER ::= 30
id-RAB-DataVolumeReportList	INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem	INTEGER ::= 32
id-RAB-DataVolumeReportRequestList	INTEGER ::= 33
id-RAB-FailedItem	INTEGER ::= 34
id-RAB-FailedList	INTEGER ::= 35
id-RAB-ID	INTEGER ::= 36
id-RAB-QueuedItem	INTEGER ::= 37
id-RAB-QueuedList	INTEGER ::= 38
id-RAB-ReleaseFailedList	INTEGER ::= 39
id-RAB-ReleaseItem	INTEGER ::= 40
id-RAB-ReleaseList	INTEGER ::= 41
id-RAB-ReleasedItem	INTEGER ::= 42
id-RAB-ReleasedList	INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp	INTEGER ::= 44
id-RAB-RelocationReleaseItem	INTEGER ::= 45
id-RAB-RelocationReleaseList	INTEGER ::= 46
id-RAB-SetupItem-RelocReq	INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck	INTEGER ::= 48
id-RAB-SetupList-RelocReq	INTEGER ::= 49
id-RAB-SetupList-RelocReqAck	INTEGER ::= 50
id-RAB-SetupOrModifiedItem	INTEGER ::= 51
id-RAB-SetupOrModifiedList	INTEGER ::= 52
id-RAB-SetupOrModifyItem	INTEGER ::= 53
id-RAB-SetupOrModifyList	INTEGER ::= 54
id-RAC	INTEGER ::= 55
id-RelocationType	INTEGER ::= 56
id-RequestType	INTEGER ::= 57
id-SAI	INTEGER ::= 58
id-SAPI	INTEGER ::= 59
id-SourceID	INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer	INTEGER ::= 61
id-TargetID	INTEGER ::= 62
id-TargetRNC-ToSourceRNC-TransparentContainer	INTEGER ::= 63
id-TemporaryUE-ID	INTEGER ::= 64

```

id-TraceReference          INTEGER ::= 65
id-TraceType               INTEGER ::= 66
id-TransportLayerAddress  INTEGER ::= 67
id-TriggerID              INTEGER ::= 68
id-UE-ID                  INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber  INTEGER ::= 70
id-RAB-FailedtoReportItem  INTEGER ::= 71
id-RAB-FailedtoReportList  INTEGER ::= 72
id-KeyStatus              INTEGER ::= 75
id-DRX-CycleLengthCoefficient  INTEGER ::= 76
id-IuSigConIdList         INTEGER ::= 77
id-IuSigConIdItem         INTEGER ::= 78
id-IuSigConId             INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf  INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf  INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf  INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf  INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem  INTEGER ::= 84
id-RAB-ContextFailedtoTransferList  INTEGER ::= 85
id-GlobalRNC-ID          INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp  INTEGER ::= 87
id-MessageStructure       INTEGER ::= 88
id-Alt-RAB-Parameters     INTEGER ::= 89
id-Ass-RAB-Parameters     INTEGER ::= 90
id-RAB-ModifyList        INTEGER ::= 91
id-RAB-ModifyItem        INTEGER ::= 92
id-TypeOfError           INTEGER ::= 93
id-BroadcastAssistanceDataDecipheringKeys  INTEGER ::= 94
id-LocationRelatedDataRequestType  INTEGER ::= 95
id-GlobalCN-ID          INTEGER ::= 96
id-LastKnownServiceArea  INTEGER ::= 97
id-RequestTypeExtension  INTEGER ::= 99
id-InterSystemInformation-TransparentContainer  INTEGER ::= 98100
id-NewBSS-To-OldBSS-Information  INTEGER ::= 99101
id-DownlinkCellLoadInformation  INTEGER ::= 100102
id-UplinkCellLoadInformation  INTEGER ::= 101103
id-SourceRNC-PDCP-context-info  INTEGER ::= 102104
id-InformationTransferID  INTEGER ::= 103105
id-SNA-Access-Information  INTEGER ::= 104106
id-ProvidedData          INTEGER ::= 105107
id-GERAN-BSC-Container   INTEGER ::= 106108
id-GERAN-Classmark       INTEGER ::= 107109
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item  INTEGER ::= 108110
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse  INTEGER ::= 109111
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode  INTEGER ::= 110112

```

END

3GPP TSG-RAN3 Meeting #33
Sophia, France, 11th-15th November 2002

Tdoc # R3-022537

CR-Form-v7	
CHANGE REQUEST	
# 25.413 CR 534 # rev 1 #	Current version: 4.6.0 #

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

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

Title:	# Encoding of information elements		
Source:	# RAN WG3		
Work item code:	# TEI4	Date:	# 11/11/2002
Category:	# F	Release:	# Rel-4
	Use <u>one</u> of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>D</i> (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:	# - Coding of the information elements representing numbers expressed in digits is ambiguous. There can be two different interpretations. This applies in particular to LAI, SAI, Source ID, Global CN-ID and Global RNC-ID information elements.
Summary of change:	# The coding of the information elements representing numbers expressed in digits is made clear. <u>Impact assessment towards the previous version of the specification (same release):</u> This CR has isolated impact towards the previous version of the specification (same release). This CR has an impact under functional and protocol point of view. The impact can be considered isolated because it only affects the addressing function. Implementations behaving like indicated in the CR will not be affected. Implementations behaving otherwise will be affected.
Consequences if not approved:	# Contradictory explanations of the coding of Plmn-id, LAI, SAI, Source ID, Global CN-ID and Global RNC-ID IEs will remain in RANAP and lead to possible

different interpretations.									
Clauses affected:	⌘ 9.2.1.14, 9.2.3.6, 9.2.3.9, 9.2.1.39, 9.2.1.46								
Other specs affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </table>	Y	N	X			X		X
	Y	N							
	X								
	X								
	X								
Other core specifications	⌘ TS 25.413 REL-5 CR 535								
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 <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.

9.2.1.24 Source ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Source ID				
> Source RNC-ID	–			
>>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler <u>digit, two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>>RNC-ID	M		INTEGER (0..4095)	
>SAI	–		9.2.3.9	

9.2.1.39 Global RNC-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global RNC-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>RNC-ID	M		INTEGER (0..4095)	

9.2.1.46 Global CN-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global CN-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>CN-ID	M		INTEGER (0..4095)	

9.2.3.6 LAI

This element is used to uniquely identify a Location Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LAI				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler <u>digit</u>. - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.

9.2.3.9 SAI

Service Area Identifier (SAI) IE information (see ref. [3]) is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN. For this protocol, only a Service Area that is defined to be applicable to the PS and CS domains shall be used.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SAI				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

3GPP TSG-RAN3 Meeting #33
Sophia, France, 11th-15th November 2002

Tdoc # R3-022538

CR-Form-v7	
CHANGE REQUEST	
# 25.413 CR 535 # rev 1 #	Current version: 5.2.0 #

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

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

Title:	# Encoding of Information Elements		
Source:	# RAN WG3		
Work item code:	# TEI4	Date:	# 11/11/2002
Category:	# A	Release:	# Rel-5
	Use <u>one</u> of the following categories: <i>F</i> (correction) <i>A</i> (corresponds to a correction in an earlier release) <i>B</i> (addition of feature), <i>C</i> (functional modification of feature) <i>D</i> (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:	# - Coding of the information elements representing numbers expressed in digits is ambiguous. There can be two different interpretations. This applies in particular to LAI, SAI, Source ID, Global CN-ID and Global RNC-ID information elements.
Summary of change:	# The coding of the information elements representing numbers expressed in digits is made clear. <u>Impact assessment towards the previous version of the specification (same release):</u> This CR has isolated impact towards the previous version of the specification (same release). This CR has an impact under functional and protocol point of view. The impact can be considered isolated because it only affects the addressing function. Implementations behaving like indicated in the CR will not be affected. Implementations behaving otherwise will be affected.
Consequences if not approved:	# Contradictory explanations of the coding of Plmn-id, LAI, SAI, Source ID, Global CN-ID and Global RNC-ID IEs will remain in RANAP and lead to possible

different interpretations.

Clauses affected:	⌘	9.2.1.14, 9.2.3.6, 9.2.3.9, 9.2.1.39, 9.2.1.46										
Other specs affected:		<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td>X</td><td></td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr></table>	Y	N	X			X		X	Other core specifications	⌘ TS 25.413 REL-4 CR 534
	Y	N										
	X											
	X											
	X											
		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.

9.2.1.24 Source ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Source ID				
> Source RNC-ID	–			
>>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler <u>digit, two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>>RNC-ID	M		INTEGER (0..4095)	
>SAI	–		9.2.3.9	

9.2.1.39 Global RNC-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global RNC-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>RNC-ID	M		INTEGER (0..4095)	

9.2.1.46 Global CN-ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Global CN-ID				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>CN-ID	M		INTEGER (0..4095)	

9.2.3.6 LAI

This element is used to uniquely identify a Location Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LAI				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit</u>, <u>two digits per octet</u>, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.

9.2.3.9 SAI

Service Area Identifier (SAI) IE information (see ref. [3]) is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN. For this protocol, only a Service Area that is defined to be applicable to the PS and CS domains shall be used.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SAI				
>PLMN identity	M		OCTET STRING (SIZE (3))	<ul style="list-style-type: none"> - digits 0 to 9, two digits per octet, each digit encoded 0000 to 1001, - 1111 used as filler <u>digit,</u> <u>two digits per octet,</u> - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler <u>digit</u> plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	