TSG-RAN Meeting #13   *TSGRP#13(01) 0698*
Beijing, China, 18 - 21, September, 2001

Title: **Agreed CRs to TS 25.413**

Source: **TSG-RAN WG3**

Agenda item: **8.3.3/8.3.4/9.4.3**

RP Tdoc	R3 Tdoc	Spec	CR_Num	Rev	Release	CR_Subject	Cat	Cur_Ver	New_Ver	Workitem
RP-010698	R3-012732	25.413	244	7	Rel-4	N-to-M relation between CN and UTRAN	B	4.1.0	4.2.0	TrFO

CR-Form-v3

CHANGE REQUEST

| ⌘ | **25.413** | CR | **244** | ⌘ | rev | **7** | ⌘ | Current version: | **4.1.0** | ⌘ |

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network **X**

Title:	⌘	N-to-M relation between CN and UTRAN
Source:	⌘	R-WG3
Work item code: ⌘	TrFO	**Date:** ⌘ 2001-08-13
Category:	⌘ **B**	**Release:** ⌘ REL-4

Use one of the following categories:
  F (essential correction)
  A (corresponds to a correction in an earlier release)
  B (Addition of feature),
  C (Functional modification of feature)
  D (Editorial modification)
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one 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)

Reason for change: ⌘	R7: The CR category was changed to "B". The TSG SA#11 approved version of 23.221 (Architecture requirements for Rel-4) includes the following statement: "*Alternatively, in the case of intra-PLMN handover, the GSM to UMTS inter-system handover or SRNS relocation between two MSC-areas may be executed as intra-MSC inter-system handover or SRNS relocation respectively. In such a case this will be performed by utilising a direct SCCP connection between the target RNC located in the target MSC-area and the MSC server already involved in the call.*" CN4 has also in a LS indicated that this option will be used for the handling of TrFO calls during SRNS relocation, and asked RAN3 to provide the necessary support for the option. The RANAP in a target RNC, implemented according to the current REL-4 version of the 25.413, will not notice if a Relocation Request message arrives from another CN node than its "default" CN node, since the signalling connection between the CN and target RNC is just established towards the CN node that sent the Relocation Request message. This message also contains the necessary user plane information that allows the RNC to establish the user plane transport to the CN node. The normal operation of this optional feature is thus already supported by the current RANAP specification, but any connectionless messages sent by the "foreign" CN node will fail since the RNC will assume that they came from it's "default" CN node. The connectionless messages from other CN nodes than the "default" CN node must include an identification of the sending CN node in order to make it possible for the RNC to send the reply to the correct CN node.

		In order to have unique Iu Signalling connection identifiers (For the Reset Resource procedure) when they can be assigned by different CN nodes, the Iu Signalling connection identifiers need to be related to the assigning CN node.
Summary of change: ⌘		The connectionless RANAP messages need a new parameter in order to identify the sending CN node (when other than the "default" CN node). Iu signalling connection handling in RNC will have to consider from which CN node it has received the Iu Signalling connection identifier. This affects the Reset Resource procedures as well.
Consequences if not approved:	⌘	If the CN chooses to use the alternative procedure for SRNS relocation between two MSC-areas, then connectionless procedures (in error situations) and the Reset Resource procedure will not work. The proposed ASN.1 changes are introduced in a backwards compatible way. The proposed changes will only affect nodes that chooses to implement the option.

Clauses affected:	⌘	3.1, 8.7.2, 8.22.1, 8.25.3.1, 8.25.3.2, 8.26.2.1, 8.26.2.2, 8.27.2, 8.29.2.2, 9.1.10, 9.1.39, 9.1.40, 9.1.41, 9.1.44, 9.2.1.xx, 9.3.3, 9.3.4, 9.3.6

Other specs affected:	⌘	**X** Other core specifications	⌘	25.410 v4.1.0 CR009
		Test specifications		
		O&M Specifications		

Other comments:	⌘	Add a definition of the Global CN Id to 23.003 and when that is done also references from 25.401 and 25.413 to this definition in 23.003.

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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.

8.7 Relocation Resource Allocation

8.7.1 General

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

8.7.2 Successful Operation

```
┌─────────────┐                              ┌────┐
│ Target RNC  │                              │ CN │
└─────────────┘                              └────┘
       │                                        │
       │         RELOCATION REQUEST             │
       │◄───────────────────────────────────── │
       │                                        │
       │  RELOCATION REQUEST                    │
       │  ACKNOWLEDGE                           │
       │ ──────────────────────────────────────►
       │                                        │
      ███                                      ███
```
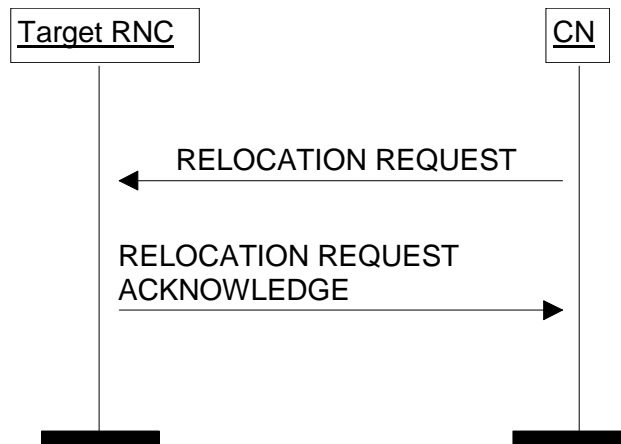
Figure 1: Relocation Resource Allocation procedure. Successful operation.

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

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

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 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 mode

- Priority level, queuing and pre-emption indication

- Service Handover

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

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

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

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

the RELOCATION REQUEST message shall be considered as coming from the default CN node for the indicated CN domain.

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

If the relocation type is "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.

If the relocation type IE is "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. 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. 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 received by the CN may optionally contain a transparent container, which shall be transferred by CN to the source RNC or the external relocation source while completing the Relocation Preparation procedure.

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

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

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

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

8.22 Initial UE Message

8.22.1 General

The purpose of the Initial UE Message procedure is to establish an Iu signalling connection between a CN domain and the RNC and to transfer the initial NAS-PDU to the default CN node. The procedure uses connection oriented signalling.
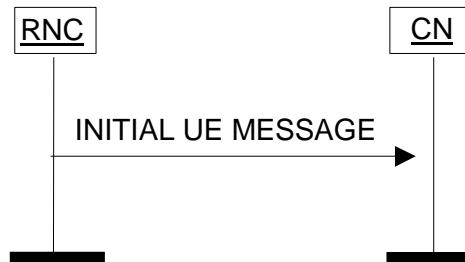
8.22.2 Successful Operation

Figure 2: Initial UE Message procedure. Successful operation.

When RNC has received from radio interface a NAS message (see ref. [8]) to be forwarded to CN domain to which the Iu signalling connection for the UE does not exist, RNC shall initiate the Initial UE Message procedure and send the INITIAL UE MESSAGE message to the CN.

In addition to the received NAS-PDU, RNC shall add following information to the INITIAL UE MESSAGE message:

- CN domain indicator, indicating the CN domain towards which this message is sent.

- For CS domain, the LAI which was the last LAI indicated to the UE by UTRAN via the current RRC connection, or if UTRAN had not yet indicated any LAI to the UE via the current RRC connection, then the LAI of the cell via which the current RRC connection was established.

- For PS domain, the LAI+RAC which were the last LAI+RAC indicated to the UE by UTRAN via the current RRC connection, or if UTRAN had not yet indicated any LAI+RAC to the UE via the current RRC connection, then the LAI+RAC of the cell via which the current RRC connection was established.

- Service Area corresponding to at least one of the cells from which the UE is consuming radio resources.

- Iu signalling connection identifier.

- Global RNC identifier.

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

Whereas several processing entities within the CN (e.g. charging, interception, etc.) may make use of the location information given in the *SAI* IE and the *LAI* (and *RAC*) IE, the mobility management within the CN shall rely on the information given within the *LAI* IE (resp. *LAI* and *RAC* IEs) only.

8.25 Overload Control

8.25.1 General

This procedure is defined to give some degree of signalling flow control. At the UTRAN "Processor Overload" and "Overload in the Capability to Send Signalling Messages to the UE" are catered for, and at the CN "Processor Overload" is catered for. The procedure uses connectionless signalling.

The philosophy used is to stem the traffic at source with known effect on the service. The algorithm used is:

At the CN side:

- If T_{igOC} is not running and an OVERLOAD message or "Signalling Point Congested" information is received, the traffic should be reduced by one step. It is also possible, optionally, to indicate the number of steps to reduce the traffic. At the same time, timers T_{igOC} and T_{inTC} should be started.

- During T_{igOC} all received OVERLOAD messages or "Signalling Point Congested" information should be ignored.

- This step by step reduction of traffic should be continued until maximum reduction is obtained by arriving at the last step.

- If T_{inTC} expires (i.e. no OVERLOAD message or "Signalling Point Congested" information is received during T_{inTC}) the traffic should be increased by one step and T_{inTC} should be started unless normal load has been resumed.

At the UTRAN side:

- If T_{igOR} is not running and an OVERLOAD message or "Signalling Point Congested" information is received, the traffic should be reduced by one step. It is also possible, optionally, to indicate the number of steps to reduce the traffic. At the same time, timers T_{igOR} and T_{inTR} should be started.

- During T_{igOR} all received OVERLOAD messages or "Signalling Point Congested" information should be ignored.

- This step-by-step reduction of traffic should be continued until maximum reduction is obtained by arriving at the last step.

- If T_{inTR} expires (i.e. no OVERLOAD message or "Signalling Point Congested" information is received during T_{inTR}) the traffic should be increased by one step and T_{inTR} should be started unless normal load has been resumed.

The number of steps and the method of reducing the load are considered to be an implementation specific function.

There may be other traffic control mechanisms from O&M activities occurring simultaneously.

8.25.2 Philosophy

Void

8.25.3 Successful Operation

8.25.3.1 Overload at the CN

Figure 3: Overload at the CN. Successful operation.

The CN should indicate to the RNC that it is in a congested state by sending an OVERLOAD message . The *CN Domain Indicator* IE may be included, if the CN can determine the domain suffering the signalling traffic overload. A specific CN node shall send this message only towards those RNCs for which it is default CN node.

The UTRAN receipt of this message should cause the reduction of signalling traffic towards the CN. If *CN Domain Indicator* IE is indicated within the OVERLOAD message, the RNC should apply signalling traffic reduction mechanisms to the indicated domain

8.25.3.2 Overload at the UTRAN

Figure 4: Overload at the UTRAN. Successful operation.

If the UTRAN is not capable to send signalling messages to the UE due to overloaded resources then the UTRAN should send an OVERLOAD message to the CN. A specific RNC shall send this message only towards its default CN node of the concerned domain(s).

8.25.4 Abnormal Conditions

Not applicable.

8.26 Reset

8.26.1 General

The purpose of the Reset procedure is to initialise the UTRAN in the event of a failure in the CN or vice versa. The procedure uses connectionless signalling.

8.26.2 Successful Operation

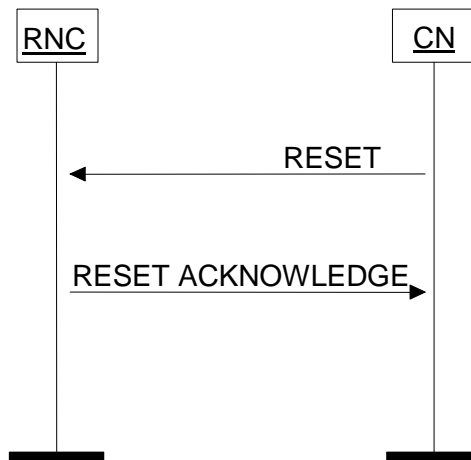### 8.26.2.1 Reset Procedure Initiated from the CN

Figure 5: Reset procedure initiated from the CN. Successful operation.

In the event of a failure at the CN, which has resulted in the loss of transaction reference information, a RESET message shall be sent to the RNC. When a CN node sends this message towards an RNC for which it is not the default CN node, the *Global CN-ID* IE shall be included. This message is used by the UTRAN to release affected Radio Access Bearers and to erase all affected references for the specific CN node that sent the RESET message, i.e. the CN node indicated by the *Global CN-ID* IE or, if this IE is not included, the default CN node for the indicated CN domain.

After a guard period of T_{RatC} seconds a RESET ACKNOWLEDGE message shall be returned to the CN, indicating that all UEs which were involved in a call are no longer transmitting and that all references at the UTRAN have been cleared.

Interactions with other procedures:

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

8.26.2.2 Reset Procedure Initiated from the UTRAN

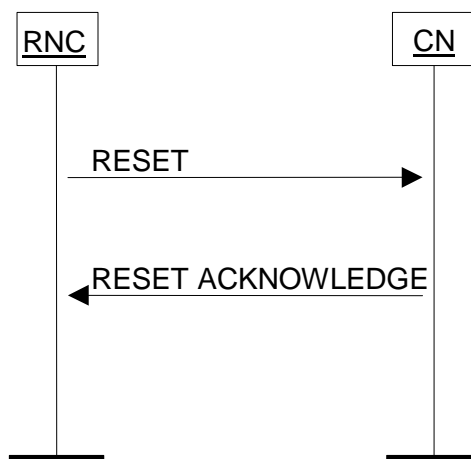**Figure 6: Reset procedure initiated from the UTRAN. Successful operation.**

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 allthe 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.

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.

8.26.3 Abnormal Conditions

8.26.3.1 Abnormal Condition at the CN

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

8.26.3.2 Abnormal Condition at the UTRAN

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

8.26.3.3 Crossing of Reset Messages

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

8.27 Error Indication

8.27.1 General

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

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

8.27.2 Successful Operation

```
┌─────┐                    ┌────┐
│ RNC │                    │ CN │
└─────┘                    └────┘
   │      ERROR INDICATION    │
   │ ◄──────────────────────── │
   │                          │
  ███                        ███
```

Figure 7: Error Indication procedure, CN originated. Successful operation.

```
┌─────┐                    ┌────┐
│ RNC │                    │ CN │
└─────┘                    └────┘
   │      ERROR INDICATION    │
   │ ────────────────────────► │
   │                          │
  ███                        ███
```

Figure 8: Error Indication procedure, RNC originated. Successful operation.

When the conditions defined in chapter 10 are fulfilled, the Error Indication procedure is initiated by an ERROR INDICATION message sent from the receiving node.

Examples for possible cause values for protocol error indications are:

- "Transfer Syntax Error".

- "Semantic Error".

- "Message not compatible with receiver state".

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

8.27.3 Abnormal Conditions

Not applicable.

8.29 Reset Resource

8.29.1 General

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

8.29.1.1 Reset Resource procedure initiated from the RNC

Void

8.29.1.2 Reset Resource procedure initiated from the CN

void

8.29.2 Successful Operation

8.29.2.1 Reset Resource procedure initiated from the RNC

Figure 9: RNC initiated Reset Resource procedure. Successful operation.

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

The RESET RESOURCE message shall include a *Cause* IE with appropriate cause value (e.g. "Signalling Transport Resource Failure").

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

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

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

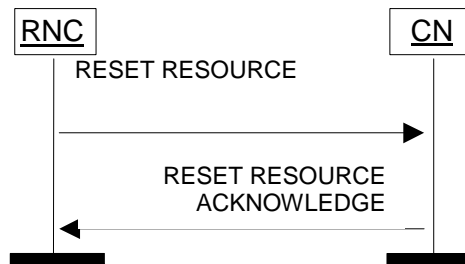### 8.29.2.2 Reset Resource procedure initiated from the CN
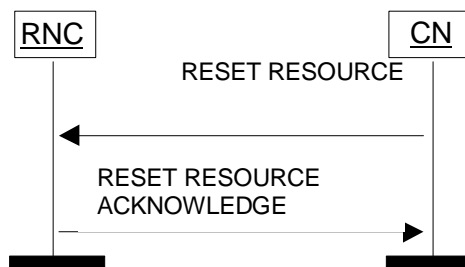
Figure 10: CN initiated Reset Resource procedure. Successful operation.

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

The RESET RESOURCE message shall include a *Cause* IE with appropriate cause value (e.g. "Signalling Transport Resource Failure").

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

On reception of this message the RNC shall release locally the resources and references (i.e. radio resources and Iu signalling connectionidentifiers) associated to the specific CN node and Iu signalling connection identifiers indicated in the received message. If no *Global CN-ID* IE is included in the RESET RESOURCE message to indicate the sending CN node, the default CN node for the indicated CN domain shall be considered as sender. The RNC shall always return the RESET RESOURCE ACKNOWLEDGE message to the CN when all Iu-related resources and references have been released. The list of Iu signalling connection identifiers within the RESET RESOURCE ACKNOWLEDGE message shall be in the same order as received in the RESET RESOURCE message. Unknown signalling connection identifiers shall be reported as released.

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

9.1.10   RELOCATION REQUEST

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

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Permanent NAS UE Identity	C – ifAvail		9.2.3.1		YES	ignore
Cause	M		9.2.1.4		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	reject
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
RABs To Be Setup List	O				YES	reject
>RABs To Be Setup Item IEs		1 to <maxnoofRABs>			EACH	reject
>>RAB ID	M		9.2.1.2		-	
>>NAS Synchronisation Indicator	C – ifNASInfoProvided		9.2.3.18		-	
>>RAB Parameters	M		9.2.1.3		-	
>>Data Volume Reporting Indication	C – ifPS		9.2.1.17		-	
>> PDP Type Information	C – ifPS		9.2.1.40		-	
>>User Plane Information	M				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		–	
>>Transport Layer Address	M		9.2.2.1		–	
>>Iu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
>> Alternative RAB Parameter Values	O		9.2.1.43		Yes	Ignore
Integrity Protection Information	C – ifAvail		9.2.1.11	Integrity Protection Information includes key and permitted algorithms.	YES	ignore
Encryption Information	O		9.2.1.12	Encryption Information includes key and permitted algorithms.	YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global CN-ID	O		9.2.1.xx		YES	reject

Condition	Explanation
IfAvail	This IE is only present if available at the sending side.
IfPS	This IE is only present for RABs towards the PS domain.
IfNASInfoProvided	This IE is present if the relevant NAS information is provided by the CN.

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

9.1.39   RESET

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

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality	
Message Type	M		9.2.1.1		YES	reject	
Cause	M		9.2.1.4		YES	ignore	
CN Domain Indicator	M		9.2.1.5		YES	reject	
Global RNC-ID	C - ifUL		9.2.1.39		YES	ignore	
Global CN-ID	O		9.2.1.xx		YES	ignore	

Condition	Explanation
IfUL	This IE is always used in uplink direction

9.1.40   RESET ACKNOWLEDGE

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

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality	
Message Type	M		9.2.1.1		YES	reject	
CN Domain Indicator	M		9.2.1.5		YES	reject	
Criticality Diagnostics	O		9.2.1.35		YES	ignore	
Global RNC-ID	C - ifUL		9.2.1.39		YES	ignore	
Global CN-ID	O		9.2.1.xx		YES	ignore	

Condition	Explanation
IfUL	This IE is always used in uplink direction

9.1.41   ERROR INDICATION

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

Direction: RNC → CN and CN → RNC.

Signalling bearer mode: Connection oriented or connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality	
Message Type	M		9.2.1.1		YES	ignore	
Cause	C - ifalone		9.2.1.4		YES	ignore	
Criticality Diagnostics	C - ifalone		9.2.1.35		YES	ignore	
CN Domain Indicator	C - ifCL		9.2.1.5		YES	ignore	
Global RNC-ID	C – ifULandCL		9.2.1.39		YES	ignore	
Global CN-ID	O		9.2.1.xx		YES	ignore	

Condition	Explanation
ifalone	At least either Cause IE or Criticality Diagnostics IE shall be present.
ifULandCL	This IE is always used in uplink direction when message is sent connectionless
ifCL	This IE is always used when the message is sent connectionless

9.1.44   RESET RESOURCE

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

Direction: CN ←→ RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
CN Domain Indicator	M		9.2.1.5		YES	reject
Cause	M		9.2.1.4		YES	ignore
Reset Resource List	M				YES	reject
>**Reset Resource Item IEs**		1 to <maxnoofIuSigConIds>			EACH	reject
>>Iu Signalling Connection Identifier	M		9.2.1.38		-	
Global RNC-ID	C - ifUL		9.2.1.39		YES	ignore
Global CN-ID	O		9.2.1.xx		YES	ignore	

Condition	Explanation
IfUL	This IE is always used in uplink direction

Range bound	Explanation
maxnoofIuSigConIds	Maximum no. of Iu signalling connection identifiers. Value is 250.

9.1.45 RESET RESOURCE ACKNOWLEDGE

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

Direction: CN ←→ RNC.

Signalling bearer mode: Connectionless.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
CN Domain Indicator	M		9.2.1.5		YES	reject
Reset Resource List	M				YES	reject
>**Reset Resource Item IEs**		1 to <maxnoofIuSigConIds>		This list shall be in the same order as the list received in the RESET RESOURCE message.	EACH	reject
>>Iu Signalling Connection Identifier	M		9.2.1.38		-	
Global RNC-ID	C - ifUL		9.2.1.39		YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore
Global CN-ID	O		9.2.1.xx		YES	ignore	

Condition	Explanation
IfUL	This IE is always used in uplink direction

Range bound	Explanation
maxnoofIuSigConIds	Maximum no. of Iu signalling connection identifiers. Value is 250.

9.2.1.45 Requested RAB Parameter Values

The purpose of *Requested RAB Parameter Values* IE is to indicate the RAB parameters for which different values are being requested, as well as those different RAB parameter values.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Requested RAB Parameter Values				
>Requested Maximum Bit Rate	C - ifReNegReq	0 to <nbr-SeparateTraffic Directions>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.
>Requested Guaranteed Bit Rate	C - ifReNegReq	0 to <nbr-SeparateTraffic Directions>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.

Range bound	Explanation
nbr-SeparateTrafficDirection	Number of Traffic Directions being signalled separately. Set to 2 if RAB Asymmetry Indicator is asymmetric bidirectional. Set to 1 in all other cases.

Condition	Explanation
ifReNegReq	This IE is only present when a different value is being requested for the RAB parameter.

9.2.1.xx   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))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>CN-ID	M		INTEGER (0..4095)	

9.3.3   PDU Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

```
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    RAB-ID,
    RAB-Parameters,
    RAC,
    RelocationType,
    RequestType,
    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-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-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-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 ASN.1 DESCRIPTION FROM SECTION 9.3.3 NOT SHOWN   ****

```
-- **************************************************************
--
-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- **************************************************************
```

```
-- ************************************************************
--
-- Relocation Request
--
-- ************************************************************

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

RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID           PRESENCE conditional
    -- This IE is only present if available at the sending side --                                    } |
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                        PRESENCE mandatory } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator           PRESENCE mandatory } |
    { ID id-SourceRNC-ToTargetRNC-TransparentContainer
                        CRITICALITY reject  TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE mandatory } |
    { ID id-RAB-SetupList-RelocReq       CRITICALITY reject  TYPE RAB-SetupList-RelocReq       PRESENCE optional } |
    { ID id-IntegrityProtectionInformation   CRITICALITY ignore  TYPE IntegrityProtectionInformation     PRESENCE conditional
    -- This IE is only present if available at the sending side --                                    } |
    { ID id-EncryptionInformation        CRITICALITY ignore  TYPE EncryptionInformation        PRESENCE optional } |
    { ID id-IuSigConId  CRITICALITY ignore TYPE IuSignallingConnectionIdentifier  PRESENCE mandatory },
    ...
}

RAB-SetupList-RelocReq                    ::= RAB-IE-ContainerList { {RAB-SetupItem-RelocReq-IEs} }

RAB-SetupItem-RelocReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-RelocReq           CRITICALITY reject  TYPE RAB-SetupItem-RelocReq      PRESENCE mandatory  },
    ...
}

RAB-SetupItem-RelocReq ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    nAS-SynchronisationIndicator    NAS-SynchronisationIndicator    OPTIONAL
    -- This IE is present if the relevant NAS information is provided by the CN --,
    rAB-Parameters                  RAB-Parameters,
    dataVolumeReportingIndication           DataVolumeReportingIndication   OPTIONAL
    -- This IE, if applicable, is only present for RABs towards the PS domain --,
    pDP-TypeInformation             PDP-TypeInformation     OPTIONAL
    -- This IE is only present for RABs towards the PS domain --,
    userPlaneInformation            UserPlaneInformation,
    transportLayerAddress           TransportLayerAddress,
    iuTransportAssociation          IuTransportAssociation,
    service-Handover                Service-Handover        OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupItem-RelocReq-ExtIEs} }          OPTIONAL,
    ...
}
```

```
RAB-SetupItem-RelocReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    {ID id-Alt-RAB-Parameters   CRITICALITY ignore     EXTENSION Alt-RAB-Parameters      PRESENCE optional},
    ...
}

UserPlaneInformation ::= SEQUENCE {
    userPlaneMode                UserPlaneMode,
    uP-ModeVersions              UP-ModeVersions,
    iE-Extensions                ProtocolExtensionContainer { {UserPlaneInformation-ExtIEs} }     OPTIONAL,
    ...
}

UserPlaneInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RelocationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID          CRITICALITY reject     EXTENSION GlobalCN-ID               PRESENCE optional},
    ...
}
```

```
  ****    LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.3 NOT SHOWN    ****
```

```
-- ************************************************************
--
-- RESET ELEMENTARY PROCEDURE
--
-- ************************************************************


-- ************************************************************
--
-- Reset
--
-- ************************************************************

Reset ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetExtensions} }                 OPTIONAL,
    ...
}

ResetIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                    CRITICALITY ignore  TYPE Cause                    PRESENCE mandatory } |
    { ID id-CN-DomainIndicator       CRITICALITY reject  TYPE CN-DomainIndicator       PRESENCE mandatory } |
    { ID id-GlobalRNC-ID             CRITICALITY ignore  TYPE GlobalRNC-ID             PRESENCE conditional
    -- This IE is always used in the uplink direction --                                          },
```

```
    ...
}

ResetExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID           CRITICALITY ignore     EXTENSION GlobalCN-ID            PRESENCE optional},
    ...
}

-- *************************************************************
--
-- Reset Acknowledge
--
-- *************************************************************

ResetAcknowledge ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container      { {ResetAcknowledgeIEs} },
    protocolExtensions    ProtocolExtensionContainer { {ResetAcknowledgeExtensions} }      OPTIONAL,
    ...
}

ResetAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator        CRITICALITY reject  TYPE CN-DomainIndicator          PRESENCE mandatory } |
     { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional } |
    { ID id-GlobalRNC-ID              CRITICALITY ignore  TYPE GlobalRNC-ID                PRESENCE conditional
    -- This IE is always used in the uplink direction --                               },
    ...
}

ResetAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID           CRITICALITY ignore     EXTENSION GlobalCN-ID            PRESENCE optional},
    ...
}
-- *************************************************************
--
-- RESET RESOURCE ELEMENTARY PROCEDURE
--
-- *************************************************************


-- *************************************************************
--
-- Reset Resource
--
-- *************************************************************

ResetResource ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container      { {ResetResourceIEs} },
    protocolExtensions    ProtocolExtensionContainer { {ResetResourceExtensions} }         OPTIONAL,
    ...
```

```
}

ResetResourceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator        CRITICALITY reject  TYPE CN-DomainIndicator        PRESENCE mandatory } |
    { ID id-Cause                     CRITICALITY ignore  TYPE Cause                     PRESENCE mandatory } |
    { ID id-IuSigConIdList            CRITICALITY ignore  TYPE ResetResourceList         PRESENCE mandatory } |
    { ID id-GlobalRNC-ID              CRITICALITY ignore  TYPE GlobalRNC-ID              PRESENCE conditional
    -- This IE is always used in the uplink direction --                                                  },
    ...
}

ResetResourceList   ::= IuSigConId-IE-ContainerList{ {ResetResourceItemIEs} }

ResetResourceItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem            CRITICALITY reject  TYPE    ResetResourceItem      PRESENCE mandatory },
    ...
}

ResetResourceItem ::= SEQUENCE {
    iuSigConId                IuSignallingConnectionIdentifier,
    iE-Extensions             ProtocolExtensionContainer { { ResetResourceItem-ExtIEs} }      OPTIONAL,
    ...
}

ResetResourceItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

ResetResourceExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID            CRITICALITY ignore      EXTENSION GlobalCN-ID           PRESENCE optional},
    ...
}

-- ************************************************************
--
-- Reset Resource Acknowledge
--
-- ************************************************************

ResetResourceAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetResourceAcknowledgeIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetResourceAcknowledgeExtensions} }      OPTIONAL,
    ...
}

ResetResourceAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator        CRITICALITY reject  TYPE CN-DomainIndicator        PRESENCE mandatory } |
    { ID id-IuSigConIdList            CRITICALITY ignore  TYPE ResetResourceAckList       PRESENCE mandatory } |
    { ID id-GlobalRNC-ID              CRITICALITY ignore  TYPE GlobalRNC-ID              PRESENCE conditional
     -- This IE is always used in the uplink direction --                                           } |
```

```
    { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional },
    ...
}
ResetResourceAckList    ::= IuSigConId-IE-ContainerList{ {ResetResourceAckItemIEs} }

ResetResourceAckItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem               CRITICALITY reject  TYPE    ResetResourceAckItem      PRESENCE mandatory   },
    ...
}

ResetResourceAckItem ::= SEQUENCE {
    iuSigConId               IuSignallingConnectionIdentifier,
    iE-Extensions            ProtocolExtensionContainer { { ResetResourceAckItem-ExtIEs} }      OPTIONAL,
    ...
}

ResetResourceAckItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

ResetResourceAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID           CRITICALITY ignore     EXTENSION GlobalCN-ID          PRESENCE optional},
    ...
}
```

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.3 NOT SHOWN   ****

```
-- *************************************************************
--
-- ERROR INDICATION ELEMENTARY PROCEDURE
--
-- *************************************************************

-- *************************************************************
--
-- Error Indication
--
-- *************************************************************

ErrorIndication ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container      { {ErrorIndicationIEs} },
    protocolExtensions     ProtocolExtensionContainer { {ErrorIndicationExtensions} }        OPTIONAL,
    ...
}

ErrorIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                CRITICALITY ignore  TYPE Cause                  PRESENCE conditional
```

```
        -- At least either of Cause IE or Criticality IE shall be present --                              } |
        { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE conditional
        -- At least either of Cause IE or Criticality IE shall be present --                              } |
        { ID id-CN-DomainIndicator        CRITICALITY ignore  TYPE CN-DomainIndicator         PRESENCE conditional
        -- This IE is always used when the message is sent connectionless --                            } |
        { ID id-GlobalRNC-ID              CRITICALITY ignore  TYPE GlobalRNC-ID             PRESENCE conditional
        -- This IE is always used in the uplink direction when message is sent connectionless --              },
        ...
}

ErrorIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID           CRITICALITY ignore      EXTENSION GlobalCN-ID             PRESENCE optional},
    ...
}
```

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.3 NOT SHOWN   ****

```
END
```

9.3.4   Information Element Definitions

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

RANAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

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

```
CN-DomainIndicator ::= ENUMERATED {
    cs-domain,
    ps-domain
}

CN-ID                  ::= INTEGER (0..4095)


-- D

DataVolumeReference        ::= INTEGER (0..255)
```

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

```
GA-Polygon-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

GA-UncertaintyEllipse ::= SEQUENCE {
    uncertaintySemi-major      INTEGER (0..127),
    uncertaintySemi-minor      INTEGER (0..127),
    orientationOfMajorAxis     INTEGER (0..179),
    ...
}

GlobalCN-ID ::= SEQUENCE {
```

```
    pLMNidentity               PLMNidentity,
    cN-ID              CN-ID
}


GlobalRNC-ID ::= SEQUENCE {
    pLMNidentity               PLMNidentity,
    rNC-ID              RNC-ID
}
```

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

```
END
```

9.3.6   Constant Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.6 NOT SHOWN   ****

```
-- *************************************************************
--
-- IEs
--
-- *************************************************************

id-AreaIdentity                          INTEGER ::= 0
id-CN-DomainIndicator                    INTEGER ::= 3
```

****   LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.6 NOT SHOWN   ****

```
id-RAB-ModifyList                        INTEGER ::= 91
id-RAB-ModifyItem                        INTEGER ::= 92
id-TypeOfError                           INTEGER ::= 93
id-GlobalCN-ID                           INTEGER ::= 96


END
```