

**TSG-RAN Meeting #11
Palm Springs, CA, U.S.A., 13-16 March 2001**

RP-010156

Title: Agreed CRs to WI "QoSPS-MAPEND-RABQoS-Negot"

Source: TSG-RAN WG3

Agenda item: 5.3.3

Tdoc_Num	Specification	CR_Num	Revision_Num	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Num	Workitem
R3-011031	25.413	272	1	RAB Quality of Service Renegotiation over lu, Proposed CR	B	agreed	3.4.0	4.0.0	QoSPS-MAPEND-RABQoS-Negot
R3-011092	25.413	273	1	Introduction of RAB QoS Negotiation in RANAP	B	agreed	3.4.0	4.0.0	QoSPS-MAPEND-RABQoS-Negot
R3-011093	25.413	274	1	Introduction of RAB QoS Negotiation during Relocation	B	agreed	3.4.0	4.0.0	QoSPS-MAPEND-RABQoS-Negot

CHANGE REQUEST

⌘ **25.413** **CR** **272** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘ Introduction of RAB QoS Renegotiation in RANAP		
Source:	⌘ R-WG3a		
Work item code:	⌘ QoSPS-MAPEND-RABQoS-Negot	Date:	⌘ 2001-03-01
Category:	⌘ B	Release:	⌘ REL-4
	<i>Use <u>one</u> of the following categories:</i> 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.		<i>Use <u>one</u> of the following releases:</i> 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:	⌘ To allow RAB QoS Renegotiation over Iu.
Summary of change:	⌘ Description of RAB Modification procedure has been added. Also RAB MODIFY REQUEST message and associated IEs have been introduced.
Consequences if not approved:	⌘ RAB QoS Renegotiation cannot be performed.

Clauses affected:	⌘ 8.1, 8.x, 9.1.y, 9.2.1.z <u>9.3.2, 9.3.3, 9.3.6</u>	
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> 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/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.

8.1 Elementary Procedures

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

Table 1: Class 1

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

Table 2: Class 2

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

Table 3: Class 3

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

The following applies concerning interference between Elementary Procedures:

- The Reset procedure takes precedence over all other EPs.

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

8.x RAB Modification Request

8.x.1 General

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

8.x.2 Successful Operation

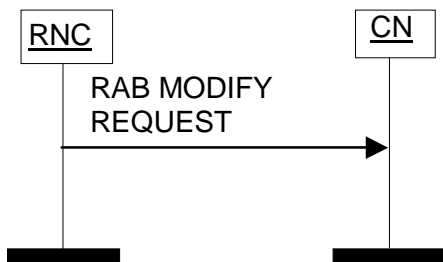


Figure 1: RAB Modification procedure.

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

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

8.x.3 Abnormal Conditions

Not applicable.

9.1.y RAB MODIFY REQUEST

This message is sent by the RNC to the CN to request modification of one or more RABs for the same UE.

Direction: RNC → CN.

Signalling bearer mode: Connection oriented.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>	<u>Criticality</u>	<u>Assigned Criticality</u>
Message Type	M		9.2.1.1		YES	ignore
RABs To Be Modified	M	1 to <maxnoofRABs>			EACH	ignore
>RAB ID	M		9.2.1.2	Uniquely identifies the RAB for a specific CN domain, for a particular UE.	-	
> Requested RAB Parameter Values	M		9.2.1.z	Includes RAB parameters for which different values than what was originally negotiated are being requested.	-	

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

9.2.1.z 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.

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

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

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

9.3.2 Elementary Procedure Definitions

```
-- *****
--
-- Elementary Procedure definitions
--
-- *****

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    Criticality,
    ProcedureCode
FROM RANAP-CommonDataTypes

    Iu-ReleaseCommand,
    Iu-ReleaseComplete,
    RelocationCommand,
    RelocationPreparationFailure,
    RelocationRequired,
    RelocationRequest,
    RelocationRequestAcknowledge,
    RelocationFailure,
    RelocationCancel,
    RelocationCancelAcknowledge,
    SRNS-ContextRequest,
    SRNS-ContextResponse,
    SecurityModeCommand,
    SecurityModeComplete,
    SecurityModeReject,
    DataVolumeReportRequest,
    DataVolumeReport,
    Reset,
    ResetAcknowledge,
    RAB-ReleaseRequest,
    Iu-ReleaseRequest,
    RelocationDetect,
    RelocationComplete,
    Paging,
```



```
CommonID,  
CN-InvokeTrace,  
CN-DeactivateTrace,  
LocationReportingControl,  
LocationReport,  
InitialUE-Message,  
DirectTransfer,  
Overload,  
ErrorIndication,  
SRNS-DataForwardCommand,  
ForwardSRNS-Context,  
RAB-AssignmentRequest,  
RAB-AssignmentResponse,  
RAB-ModifyRequest,  
PrivateMessage,  
ResetResource,  
ResetResourceAcknowledge,  
RANAP-RelocationInformation  
FROM RANAP-PDU-Contents
```

```
id-CN-DeactivateTrace,  
id-CN-InvokeTrace,  
id-CommonID,  
id-DataVolumeReport,  
id-DirectTransfer,  
id-ErrorIndication,  
id-ForwardSRNS-Context,  
id-InitialUE-Message,  
id-Iu-Release,  
id-Iu-ReleaseRequest,  
id-LocationReport,  
id-LocationReportingControl,  
id-OverloadControl,  
id-Paging,  
id-privateMessage,  
id-RAB-Assignment,  
id-RAB-ReleaseRequest,  
id-RAB-ModifyRequest,  
id-RANAP-Relocation,  
id-RelocationCancel,  
id-RelocationComplete,  
id-RelocationDetect,  
id-RelocationPreparation,  
id-RelocationResourceAllocation,  
id-Reset,  
id-SRNS-ContextTransfer,  
id-SRNS-DataForward,  
id-SecurityModeControl,  
id-ResetResource  
FROM RANAP-Constants;
```

```
-- *****
```

```

--
-- Interface Elementary Procedure Class
--
-- *****

RANAP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage      ,
    &SuccessfulOutcome      OPTIONAL,
    &UnsuccessfulOutcome    OPTIONAL,
    &Outcome                OPTIONAL,
    &procedureCode          ProcedureCode  UNIQUE,
    &criticality            Criticality    DEFAULT ignore
}
WITH SYNTAX {
    INITIATING MESSAGE      &InitiatingMessage
    [SUCCESSFUL OUTCOME     &SuccessfulOutcome]
    [UNSUCCESSFUL OUTCOME   &UnsuccessfulOutcome]
    [OUTCOME                &Outcome]
    PROCEDURE CODE         &procedureCode
    [CRITICALITY           &criticality]
}

-- *****
--
-- Interface PDU Definition
--
-- *****

RANAP-PDU ::= CHOICE {
    initiatingMessage      InitiatingMessage,
    successfulOutcome      SuccessfulOutcome,
    unsuccessfulOutcome    UnsuccessfulOutcome,
    outcome                Outcome,
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode          RANAP-ELEMENTARY-PROCEDURE.&procedureCode    ({RANAP-ELEMENTARY-PROCEDURES}),
    criticality            RANAP-ELEMENTARY-PROCEDURE.&criticality        ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                  RANAP-ELEMENTARY-PROCEDURE.&InitiatingMessage  ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode          RANAP-ELEMENTARY-PROCEDURE.&procedureCode    ({RANAP-ELEMENTARY-PROCEDURES}),
    criticality            RANAP-ELEMENTARY-PROCEDURE.&criticality        ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                  RANAP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome  ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode          RANAP-ELEMENTARY-PROCEDURE.&procedureCode    ({RANAP-ELEMENTARY-PROCEDURES}),
    criticality            RANAP-ELEMENTARY-PROCEDURE.&criticality        ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                  RANAP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome  ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

```

```

}

Outcome ::= SEQUENCE {
    procedureCode RANAP-ELEMENTARY-PROCEDURE.&procedureCode    ({RANAP-ELEMENTARY-PROCEDURES}),
    criticality RANAP-ELEMENTARY-PROCEDURE.&criticality        ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       RANAP-ELEMENTARY-PROCEDURE.&Outcome          ({RANAP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

-- *****
--
-- Interface Elementary Procedure List
--
-- *****

RANAP-ELEMENTARY-PROCEDURES RANAP-ELEMENTARY-PROCEDURE ::= {
    RANAP-ELEMENTARY-PROCEDURES-CLASS-1 |
    RANAP-ELEMENTARY-PROCEDURES-CLASS-2 |
    RANAP-ELEMENTARY-PROCEDURES-CLASS-3 ,
    ...
}

RANAP-ELEMENTARY-PROCEDURES-CLASS-1 RANAP-ELEMENTARY-PROCEDURE ::= {
    iu-Release |
    relocationPreparation |
    relocationResourceAllocation |
    relocationCancel |
    sRNS-ContextTransfer |
    securityModeControl |
    dataVolumeReport |
    reset |
    resetResource ,
    ...
}

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

```

```

privateMessage |
rANAP-Relocation ,
...
rAB-ModifyRequest
}

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

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

iu-Release RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE Iu-ReleaseCommand
  SUCCESSFUL OUTCOME Iu-ReleaseComplete
  PROCEDURE CODE id-Iu-Release
  CRITICALITY ignore
}

relocationPreparation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationRequired
  SUCCESSFUL OUTCOME RelocationCommand
  UNSUCCESSFUL OUTCOME RelocationPreparationFailure
  PROCEDURE CODE id-RelocationPreparation
  CRITICALITY ignore
}

relocationResourceAllocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationRequest
  SUCCESSFUL OUTCOME RelocationRequestAcknowledge
  UNSUCCESSFUL OUTCOME RelocationFailure
  PROCEDURE CODE id-RelocationResourceAllocation
  CRITICALITY ignore
}

relocationCancel RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE RelocationCancel
  SUCCESSFUL OUTCOME RelocationCancelAcknowledge
  PROCEDURE CODE id-RelocationCancel
  CRITICALITY ignore
}

sRNS-ContextTransfer RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE SRNS-ContextRequest
  SUCCESSFUL OUTCOME SRNS-ContextResponse
  PROCEDURE CODE id-SRNS-ContextTransfer
  CRITICALITY ignore
}

```

```
}

securityModeControl RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE SecurityModeCommand
    SUCCESSFUL OUTCOME SecurityModeComplete
    UNSUCCESSFUL OUTCOME SecurityModeReject
    PROCEDURE CODE id-SecurityModeControl
    CRITICALITY ignore
}

dataVolumeReport RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE DataVolumeReportRequest
    SUCCESSFUL OUTCOME DataVolumeReport
    PROCEDURE CODE id-DataVolumeReport
    CRITICALITY ignore
}

reset RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE Reset
    SUCCESSFUL OUTCOME ResetAcknowledge
    PROCEDURE CODE id-Reset
    CRITICALITY ignore
}

rAB-ReleaseRequest RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE RAB-ReleaseRequest
    PROCEDURE CODE id-RAB-ReleaseRequest
    CRITICALITY ignore
}

iu-ReleaseRequest RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE Iu-ReleaseRequest
    PROCEDURE CODE id-Iu-ReleaseRequest
    CRITICALITY ignore
}

relocationDetect RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE RelocationDetect
    PROCEDURE CODE id-RelocationDetect
    CRITICALITY ignore
}

relocationComplete RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE RelocationComplete
    PROCEDURE CODE id-RelocationComplete
    CRITICALITY ignore
}

paging RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE Paging
    PROCEDURE CODE id-Paging
}
```

```
    CRITICALITY    ignore
}

commonID RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    CommonID
    PROCEDURE CODE        id-CommonID
    CRITICALITY            ignore
}

cN-InvokeTrace RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    CN-InvokeTrace
    PROCEDURE CODE        id-CN-InvokeTrace
    CRITICALITY            ignore
}

cN-DeactivateTrace RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    CN-DeactivateTrace
    PROCEDURE CODE        id-CN-DeactivateTrace
    CRITICALITY            ignore
}

locationReportingControl RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    LocationReportingControl
    PROCEDURE CODE        id-LocationReportingControl
    CRITICALITY            ignore
}

locationReport RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    LocationReport
    PROCEDURE CODE        id-LocationReport
    CRITICALITY            ignore
}

initialUE-Message RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    InitialUE-Message
    PROCEDURE CODE        id-InitialUE-Message
    CRITICALITY            ignore
}

directTransfer RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    DirectTransfer
    PROCEDURE CODE        id-DirectTransfer
    CRITICALITY            ignore
}

overloadControl RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE    Overload
    PROCEDURE CODE        id-OverloadControl
    CRITICALITY            ignore
}

errorIndication RANAP-ELEMENTARY-PROCEDURE ::= {
```

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```

INITIATING MESSAGE  ErrorIndication
PROCEDURE CODE      id-ErrorIndication
CRITICALITY         ignore
}

sRNS-DataForward RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  SRNS-DataForwardCommand
  PROCEDURE CODE      id-SRNS-DataForward
  CRITICALITY         ignore
}

forwardSRNS-Context RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  ForwardSRNS-Context
  PROCEDURE CODE      id-ForwardSRNS-Context
  CRITICALITY         ignore
}

rAB-Assignment RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RAB-AssignmentRequest
  OUTCOME              RAB-AssignmentResponse
  PROCEDURE CODE      id-RAB-Assignment
  CRITICALITY         ignore
}

privateMessage RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  PrivateMessage

  PROCEDURE CODE      id-privateMessage
  CRITICALITY         ignore
}

resetResource RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  ResetResource
  SUCCESSFUL OUTCOME  ResetResourceAcknowledge
  PROCEDURE CODE      id-ResetResource
  CRITICALITY         ignore
}

rANAP-Relocation RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RANAP-RelocationInformation
  PROCEDURE CODE      id-RANAP-Relocation
  CRITICALITY         ignore
}

rAB-ModifyRequest RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE  RAB-ModifyRequest
  PROCEDURE CODE      id-RAB-ModifyRequest
  CRITICALITY         ignore
}

END

```

9.3.3 PDU Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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



```

PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
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
FROM RANAP-IEs

```

```

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

```

```

maxNrOfDTs,
maxNrOfErrors,
maxNrOfIuSigConIds,
maxNrOfRABs,
maxNrOfVol,

id-AreaIdentity,
id-CN-DomainIndicator,
id-Cause,
id-ChosenEncryptionAlgorithm,

```

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id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-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;

-- *****
--
-- Common Container Lists
--
-- *****

RAB-IE-ContainerList          { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfRABs, {IEsSetParam} }
RAB-IE-ContainerPairList     { RANAP-PROTOCOL-IES-PAIR : IEsSetParam } ::= ProtocolIE-ContainerPairList { 1, maxNrOfRABs, {IEsSetParam} }
ProtocolError-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfRABs, {IEsSetParam} }
IuSigConId-IE-ContainerList  { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfIuSigConIds, {IEsSetParam} }
DirectTransfer-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfDTs, {IEsSetParam} }

```

LOTS OF UNAFFECTED ASN.1 DESCRIPTION NOT SHOWN

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```

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

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

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

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

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

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

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

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

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

RAB-ContextItem-RANAP-RelocInf ::= SEQUENCE {
    rAB-ID          RAB-ID,
    dl-GTP-PDU-SequenceNumber DL-GTP-PDU-SequenceNumber OPTIONAL
}

```

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```

--This IE is only present when available--,
ul-GTP-PDU-SequenceNumber      UL-GTP-PDU-SequenceNumber  OPTIONAL
--This IE is only present when available--,
dl-N-PDU-SequenceNumber        DL-N-PDU-SequenceNumber  OPTIONAL
--This IE is only present when available--,
ul-N-PDU-SequenceNumber        UL-N-PDU-SequenceNumber  OPTIONAL
--This IE is only present when available--,
iE-Extensions                   ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs-RANAP-RelocInf} }
...
}

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

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

-- *****
--
-- RAB MODIFICATION REQUEST ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- RAB Modify Request
--
-- *****

RAB-ModifyRequest ::= SEQUENCE {
protocolIEs          ProtocolIE-Container      { {RAB-ModifyRequestIEs} },
protocolExtensions ProtocolExtensionContainer { {RAB-ModifyRequestExtensions} }
...
}

RAB-ModifyRequestIEs RANAP-PROTOCOL-IES ::= {
{ ID id-RAB-ModifyList          CRITICALITY ignore TYPE RAB-ModifyList          PRESENCE mandatory},
...
}

RAB-ModifyList ::= RAB-IE-ContainerList { {RAB-ModifyItemIEs} }

RAB-ModifyItemIEs RANAP-PROTOCOL-IES ::= {
{ ID id-RAB-ModifyItem          CRITICALITY ignore TYPE RAB-ModifyItem          PRESENCE mandatory },
...
}

RAB-ModifyItem ::= SEQUENCE {
rAB-ID                      RAB-ID,
requested-RAB-Parameter-Values Requested-RAB-Parameter-Values,

```

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```

    iE-Extensions ProtocolExtensionContainer { {RAB-ModifyItem-ExtIEs} } OPTIONAL,
    ...
}
RAB-ModifyItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
RAB-ModifyRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
END

```

9.3.4 Information Element Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxNrOfErrors,
    maxNrOfPDPDirections,
    maxNrOfPoints,
    maxNrOfRABs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination

FROM RANAP-Constants

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

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

```

-- A

```

AllocationOrRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability  Pre-emptionCapability,
    pre-emptionVulnerability  Pre-emptionVulnerability,
    queuingAllowed        QueuingAllowed,
    iE-Extensions         ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
    ...
}

```

```

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

```

```

AreaIdentity ::= CHOICE {
    sAI          SAI,
    geographicalArea  GeographicalArea,
    ...
}

```

LOTS OF UNAFFECTED ASN.1 DESCRIPTION NOT SHOWN

-- R

```

RAB-AsymmetryIndicator ::= ENUMERATED {
    symmetric-bidirectional,
    asymmetric-unidirectional-downlink,
    asymmetric-unidirectional-uplink,
    asymmetric-bidirectional,
    ...
}

```

```

RAB-ID ::= BIT STRING (SIZE (8))

```

```

RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

```

```

RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

```

```

RAB-Parameters ::= SEQUENCE {
    trafficClass          TrafficClass,
    rAB-AsymmetryIndicator  RAB-AsymmetryIndicator,
    maxBitrate            RAB-Parameter-MaxBitrateList,
    guaranteedBitRate     RAB-Parameter-GuaranteedBitrateList OPTIONAL
    -- This IE is only present when traffic class indicates Conversational or Streaming --,
    deliveryOrder         DeliveryOrder,
    maxSDU-Size           MaxSDU-Size,
    sDU-Parameters        SDU-Parameters,
    transferDelay         TransferDelay OPTIONAL
    -- This IE is only present when traffic class indicates Conversational or Streaming --,
}

```

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```

trafficHandlingPriority      TrafficHandlingPriority OPTIONAL
-- This IE is only present when traffic class indicates Interactiv --,
allocationOrRetentionPriority AllocationOrRetentionPriority OPTIONAL,
sourceStatisticsDescriptor  SourceStatisticsDescriptor OPTIONAL
-- This IE is only present when traffic class indicates Conversational or Streaming --,
relocationRequirement      RelocationRequirement OPTIONAL
-- This IE is only present for RABs towards the PS domain --,
iE-Extensions              ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
...
}

RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

RAB-SubflowCombinationBitRate ::= INTEGER (0..16000000)

RAB-TrCH-Mapping ::= SEQUENCE ( SIZE (1..maxNrOfRABs)) OF
RAB-TrCH-MappingItem

RAB-TrCH-MappingItem ::= SEQUENCE {
rAB-ID          RAB-ID,
trCH-ID-List    TrCH-ID-List,
...
}

RAC ::= OCTET STRING (SIZE (1))

RAI ::= SEQUENCE {
lAI             LAI,
rAC             RAC,
iE-Extensions  ProtocolExtensionContainer { {RAI-ExtIEs} } OPTIONAL,
...
}

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

RateControlAllowed ::= ENUMERATED {
not-allowed,
allowed
}

RelocationRequirement ::= ENUMERATED {
lossless,
none,
...
}

RelocationType ::= ENUMERATED {
ue-not-involved,

```



```

    ue-involved,
    ...
}

RepetitionNumber ::= INTEGER (1..256)

ReportArea ::= ENUMERATED {
    service-area,
    geographical-coordinates,
    ...
}

Requested-RAB-Parameter-Values ::= SEQUENCE {
    requestedMaxBitrates           Requested-RAB-Parameter-MaxBitrateList           OPTIONAL
    -- This IE is only present when a different value is being requested for the RAB Parameter --,
    requestedGuaranteedBitrates    Requested-RAB-Parameter-GuaranteedBitrateList    OPTIONAL
    -- This IE is only present when a different value is being requested for the RAB Parameter --,
    iE-Extensions                 ProtocolExtensionContainer { { Requested-RAB-Parameter-Values-ExtIEs } } OPTIONAL,
    ...
}

Requested-RAB-Parameter-Values-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

Requested-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

Requested-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

RequestType ::= SEQUENCE {
    event           Event,
    reportArea      ReportArea,
    accuracyCode    INTEGER (0..127) OPTIONAL,
    -- To be used if Geographical Coordinates shall be reported with a requested accuracy. --
    ...
}

ResidualBitErrorRatio ::= SEQUENCE {
    mantissa        INTEGER (1..9),
    exponent        INTEGER (1..8),
    iE-Extensions   ProtocolExtensionContainer { {ResidualBitErrorRatio-ExtIEs} } OPTIONAL
}
-- ResidualBitErrorRatio = mantissa * 10^-exponent

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

RNC-ID                ::= INTEGER (0..4095)
-- RNC-ID              ::= BIT STRING (SIZE (12))
-- Harmonized with RNSAP and NBAP definitions

```

RRC-Container ::= OCTET STRING

LOTS OF UNAFFECTED ASN.1 DESCRIPTION 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

```

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```

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

```

```

-- *****
--
-- 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

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

```

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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

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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
<u>id-RAB-ModifyList</u>	<u>INTEGER ::= 90</u>
<u>id-RAB-ModifyItem</u>	<u>INTEGER ::= 91</u>

END

CHANGE REQUEST

⌘ **25.413** **CR** **273** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘ Introduction of RAB QoS Negotiation in RANAP		
Source:	⌘ R-WG3		
Work item code:	⌘ QoSPS-MAPEND-RABQoS-Negot	Date:	⌘ 2001-03-02
Category:	⌘ B	Release:	⌘ REL-4
	<i>Use one of the following categories:</i> 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.		<i>Use one of the following releases:</i> 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:	⌘ RAB QoS Negotiation over lu shall be possible to perform for maximum and guaranteed bit rate.
Summary of change:	⌘ The messages RAB ASSIGNMENT REQUEST and RAB ASSIGNMENT RESPONSE have been updated. Some additional procedure text has been added.
Consequences if not approved:	⌘ RAB QoS Negotiation can't be performed. Additional Information: The proposed change is backwards compatible.

Clauses affected:	⌘ 8.2.2, 9.1.3, 9.1.4, 9.2.1.x, 9.2.1.y, 9.3.3, 9.3.4, 9.3.6		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘ <input type="checkbox"/>	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> 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/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.

8.2 RAB Assignment

8.2.1 General

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

8.2.2 Successful Operation

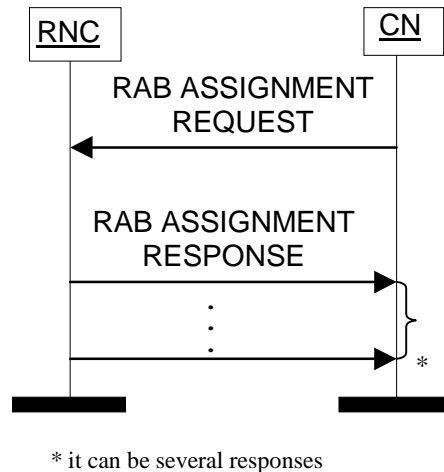


Figure 1: RAB Assignment procedure. Successful operation.

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 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.
- RAB parameters (including e.g. Allocation/Retention Priority).
- User Plane Mode Information (i.e. User Plane Mode and UP Mode Versions).
- Transport Layer Address.
- Iu Transport Association.
- PDP Type Information (only for PS)

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

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

- RAB ID (mandatory).
- NAS Synchronisation Indicator.
- RAB parameters.
- Transport Layer Address.
- Iu Transport Association.

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 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 used" the given values for the *Pre-emption Capability* IE and *Pre-emption Vulnerability* IE shall not be considered. Instead the values "shall not trigger pre-emption" and "not pre-emptable" shall prevail.
- If the *Allocation/Retention Priority* IE is not given in the RAB ASSIGNMENT REQUEST message, the allocation request shall not trigger the pre-emption process and the connection may be pre-empted and considered to have the value "lowest" as priority level. Moreover, queuing shall not be allowed.
 - The UTRAN pre-emption process shall keep the following rules:
 1. UTRAN shall only pre-empt RABs with lower priority, in ascending order of priority.
 2. The pre-emption may be done for RABs belonging to the same UE or to other UEs.

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

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

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

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

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

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

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

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

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

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.

UTRAN shall report the outcome of a specific RAB to establish or modify only after the transport network control plane signalling, which is needed for RAB establishment or modification, has been executed. The transport network control plane signalling shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification, it is up to the RNC to decide if any transport network control plane signalling shall be performed for the possibly included *Transport Layer Address* IE and *Iu Transport Association* IE or if the already existing transport

bearer shall be used. If the RNC decides to establish a new transport bearer, then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode.

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

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

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

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

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

- successfully established or modified;
- failed to establish or modify;
- failed due to expiry of the timer $T_{QUEUING}$.

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".

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.

8.2.3 Unsuccessful Operation

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

8.2.4 Abnormal Conditions

Interactions with Relocation Preparation procedure:

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

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

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

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

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

9.1.3 RAB ASSIGNMENT REQUEST

This message is sent by the CN to request the establishment, modification or release of one or more RABs for the same UE.

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
RABs To Be Setup Or Modified	C – ifNoOtherGroup	0 to <maxnoofRABs>			EACH	ignore
>First Setup Or Modify Item	M			Grouping reason: same criticality	YES	reject
>>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>>NAS Synchronisation Indicator	C- ifModifandNASInfoProvided		9.2.3.18		-	
>>RAB Parameters	C - ifSetuporNewValues		9.2.1.3	Includes all necessary parameters for RABs (both for MSC and SGSN) including QoS.	-	
>>User Plane Information	C - ifSetup				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		-	
>>Transport Layer Information	C- ifNotOnlyNSI				-	
>>>Transport Layer Address	M		9.2.2.1		-	
>>>lu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
>Second Setup Or Modify Item	M			Grouping reason: same criticality	YES	ignore
>> PDP Type Information	C – ifPSandSetup		9.2.1.40		-	
>>Data Volume Reporting Indication	C – ifPSandSetup		9.2.1.17		-	
>>DL GTP-PDU Sequence Number	C- ifAvailPSandSetup		9.2.2.3		-	
>>UL GTP-PDU Sequence Number	C- ifAvailPSandSetup		9.2.2.4		-	
>>DL N-PDU Sequence Number	C- ifAvailPSandSetup		9.2.1.33		-	
>>UL N-PDU Sequence Number	C- ifAvailPSandSetup		9.2.1.34		-	
>>Alternative RAB Parameter Values	<u>O</u>		<u>9.2.1.x</u>		<u>YES</u>	<u>ignore</u>
RABs To Be Released	C –	0 to			EACH	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
	ifNoOtherGroup	<maxnoofRABs>				
>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>Cause	M		9.2.1.4		-	

Condition	Explanation
IfPSandSetup	This IE is only present for RABs towards the PS domain at RAB establishment.
IfAvailPSandSetup	This IE is only present when available for RABs towards the PS domain at RAB establishment.
IfNoOtherGroup	This group must be present at least when no other group is present, i.e. at least one group must be present.
IfModifandNASInfoProvided	This IE is present at a RAB modification if the relevant NAS information is provided by the CN.
IfSetup	This IE or IE group is present only at a RAB establishment.
IfSetuporNewValue	This IE or IE group is present at a RAB establishment or when any previously set value shall be modified at a RAB modification.
IfNotOnlyNSI	This IE group must not be present if the only other IEs included at a RAB modification are the RAB ID and the NAS Synchronisation Indicator.

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

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	ignore
RABs Setup Or Modified	C - ifNoOtherGroup	0 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	C - ifPS		9.2.2.1		-	
>lu Transport Association	C - ifPS		9.2.2.2		-	
>Data Volume	C – ifModReqPS	0 to <maxnoofVol>			-	
>>Unsuccessfully Transmitted DL Data Volume	M		9.2.3.12		-	
>>Data Volume Reference	O		9.2.3.13		-	
>Assigned RAB Parameter Values	C - ifAltValuesAss		9.2.1.y		YES	ignore
RABs Released	C – ifNoOtherGroup	0 to <maxnoofRABs>			EACH	ignore
>RAB ID	M		9.2.1.2	The same RAB ID must only be present in one group.	-	
>Data Volume	C – ifReqPS	0 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	C- ifAvailUiPS		9.2.2.3		-	
>UL GTP-PDU Sequence Number	C- ifAvailUiPS		9.2.2.4		-	
RABs Queued	C – ifNoOtherGroup	0 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	C – ifNoOtherGroup	0 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	C – ifNoOtherGr	0 to <maxnoofRABs>			EACH	ignore

	oup					
>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

Condition	Explanation
IfPS	This IE is only present for RABs towards the PS domain.
IfNoOtherGroup	This group must be present at least when no other group is present, i.e. at least one group must be present.
IfReqPS	This IE is only present if data volume reporting for PS domain is required.
IfModReqPS	This IE is only present if the RAB has been modified and the data volume reporting for PS domain is required.
IfAvailUiPS	This IE is only present for RABs towards the PS domain when available and when the release was initiated by UTRAN.
<u>IfAltValuesAss</u>	<u>This IE is only present if any alternative RAB parameter values have been assigned.</u>

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.x 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.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
<u>Alternative RAB parameter values</u>				
<u>>Alternative Maximum Bit Rate Information</u>	<u>O</u>			Included only if negotiation is allowed for this IE.
<u>>>Type of Alternative Maximum Bit Rate Information</u>	<u>M</u>		<u>ENUMERATED (Unspecified, Value range, Discrete values)</u>	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN.
<u>>>>Alternative Maximum Bit Rates</u>	<u>C - ifValueRangeorDiscreteValues</u>	<u>1 to <nbr-AlternativeValues></u>		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.
<u>>>>>Bit Rate</u>	<u>M</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (1..16,000,000)</u>	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
<u>>Alternative Guaranteed Bit Rate Information</u>	<u>O</u>			Included only if negotiation is allowed for this IE.
<u>>>Type of Alternative Guaranteed Bit Rate Information</u>	<u>M</u>		<u>ENUMERATED (Unspecified, Value range, Discrete values)</u>	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN.
<u>>>>Alternative Guaranteed Bit Rates</u>	<u>C - ifValueRangeorDiscreteValues</u>	<u>1 to <nbr-AlternativeValues></u>		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.
<u>>>>>Bit Rate</u>	<u>M</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (0..16,000,000)</u>	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

<u>Condition</u>	<u>Explanation</u>
<u>ifValueRangeorDiscreteValues</u>	<u>This IE is only present when a value range or discrete values are given.</u>

9.2.1.y Assigned RAB Parameter Values

The purpose of the *Assigned RAB Parameter Values* IE is to indicate that RAB QoS negotiation has been performed for certain RAB parameters and which values that have been chosen.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
Assigned RAB parameter values				
>Assigned Maximum Bit Rate	C - ifNegPerf	1 to <nbr- SeparateTrafficDir ections>	INTEGER (1..16,000,000)	When nbr- SeparateTrafficDirections is equal to 2, then Assigned Maximum Bit Rate attribute for downlink is signalled first, then Assigned Maximum Bit Rate attribute for uplink.
>Assigned Guaranteed Bit Rate	C - ifNegPerf	1 to <nbr- SeparateTrafficDir ections>	INTEGER (0..16,000,000)	When nbr- SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.

<u>Range Bound</u>	<u>Explanation</u>
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.

<u>Condition</u>	<u>Explanation</u>
ifNegPerf	This IE is only present when RAB QoS Negotiation has been performed for the RAB Parameter in question.

9.3.3 PDU Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

```
OldBSS-ToNewBSS-Information,  
PagingAreaID,  
PagingCause,  
PDP-TypeInformation,  
PermanentNAS-UE-ID,  
RAB-ID,  
RAB-Parameters,  
RAC,  
RelocationType,  
RequestType,  
SAI,  
SAPI,  
Service-Handover,  
SourceID,  
SourceRNC-ToTargetRNC-TransparentContainer,  
TargetID,  
TargetRNC-ToSourceRNC-TransparentContainer,  
TemporaryUE-ID,  
TraceReference,  
TraceType,  
UnsuccessfullyTransmittedDataVolume,  
TransportLayerAddress,  
TriggerID,  
UE-ID,  
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-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,

```

id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,
id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-SAI,
id-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 REMOVED ******

```

-- *****
--
-- RAB ASSIGNMENT ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- RAB Assignment Request
--
-- *****

```



```

RAB-AssignmentRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {RAB-AssignmentRequestIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RAB-AssignmentRequestExtensions} }      OPTIONAL,
    ...
}

RAB-AssignmentRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifyList          CRITICALITY ignore  TYPE RAB-SetupOrModifyList          PRESENCE conditional          } |
    { ID id-RAB-ReleaseList                CRITICALITY ignore  TYPE RAB-ReleaseList                PRESENCE conditional          } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    ...
}

RAB-SetupOrModifyList ::= RAB-IE-ContainerPairList { {RAB-SetupOrModifyItem-IEs} }

RAB-SetupOrModifyItem-IEs RANAP-PROTOCOL-IES-PAIR ::= {
    { ID id-RAB-SetupOrModifyItem          FIRST CRITICALITY reject  FIRST TYPE RAB-SetupOrModifyItemFirst
      SECOND CRITICALITY ignore  SECOND TYPE RAB-SetupOrModifyItemSecond
      PRESENCE mandatory },
    ...
}

RAB-SetupOrModifyItemFirst ::= SEQUENCE {
    rAB-ID                RAB-ID,
    nAS-SynchronisationIndicator  NAS-SynchronisationIndicator  OPTIONAL
    -- This IE is present at a RAB modification if the relevant NAS information is provided by the CN --,
    rAB-Parameters        RAB-Parameters        OPTIONAL
    -- This IE is present at a RAB establishment or when any previously set value shall be modified at a RAB modification --,
    userPlaneInformation  UserPlaneInformation  OPTIONAL
    -- This IE is present only at a RAB establishment --,
    transportLayerInformation  TransportLayerInformation  OPTIONAL
    -- This IE must not be present if the only other IEs included at a RAB modification are the RAB ID and the NAS Synchronisation Indicator --,
    service-Handover      Service-Handover      OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { {RAB-SetupOrModifyItemFirst-ExtIEs} }      OPTIONAL,
    ...
}

TransportLayerInformation ::= SEQUENCE {
    transportLayerAddress  TransportLayerAddress,
    iuTransportAssociation IuTransportAssociation,
    iE-Extensions         ProtocolExtensionContainer { {TransportLayerInformation-ExtIEs} }      OPTIONAL,
    ...
}

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

RAB-SetupOrModifyItemFirst-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

RAB-SetupOrModifyItemSecond ::= SEQUENCE {
    pDP-TypeInformation          PDP-TypeInformation          OPTIONAL
    -- This IE is only present for RABs towards the PS domain at RAB establishment --,
    dataVolumeReportingIndication DataVolumeReportingIndication OPTIONAL
    -- This IE, if applicable, is only present for RABs towards the PS domain at RAB establishment --,
    dl-GTP-PDU-SequenceNumber    DL-GTP-PDU-SequenceNumber OPTIONAL
    -- This IE, if available, is only present for RABs towards the PS domain at RAB establishment --,
    ul-GTP-PDU-SequenceNumber    UL-GTP-PDU-SequenceNumber OPTIONAL
    -- This IE, if available, is only present for RABs towards the PS domain at RAB establishment --,
    dl-N-PDU-SequenceNumber      DL-N-PDU-SequenceNumber   OPTIONAL
    -- This IE, if available, is only present for RABs towards the PS domain at RAB establishment --,
    ul-N-PDU-SequenceNumber      UL-N-PDU-SequenceNumber   OPTIONAL
    -- This IE, if available, is only present for RABs towards the PS domain at RAB establishment --,
    iE-Extensions                ProtocolExtensionContainer { {RAB-SetupOrModifyItemSecond-ExtIEs} } OPTIONAL,
    ...
}

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

RAB-AssignmentRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- RAB Assignment Response
--
-- *****

RAB-AssignmentResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {RAB-AssignmentResponseIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RAB-AssignmentResponseExtensions} } OPTIONAL,
    ...
}

RAB-AssignmentResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifiedList    CRITICALITY ignore    TYPE RAB-SetupOrModifiedList    PRESENCE conditional } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    { ID id-RAB-ReleasedList          CRITICALITY ignore    TYPE RAB-ReleasedList          PRESENCE conditional } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    { ID id-RAB-QueuedList             CRITICALITY ignore    TYPE RAB-QueuedList            PRESENCE conditional } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    { ID id-RAB-FailedList             CRITICALITY ignore    TYPE RAB-FailedList            PRESENCE conditional } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    { ID id-RAB-ReleaseFailedList      CRITICALITY ignore    TYPE RAB-ReleaseFailedList     PRESENCE conditional } |
    -- This group must be present at least when no other group is present, ie. at least one group must be present --
    { ID id-CriticalityDiagnostics     CRITICALITY ignore    TYPE CriticalityDiagnostics    PRESENCE optional },
    ...
}

```

```

}

RAB-SetupOrModifiedList ::= RAB-IE-ContainerList { {RAB-SetupOrModifiedItemIEs} }

RAB-SetupOrModifiedItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-SetupOrModifiedItem          CRITICALITY ignore  TYPE RAB-SetupOrModifiedItem          PRESENCE mandatory },
  ...
}

RAB-SetupOrModifiedItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  transportLayerAddress TransportLayerAddress OPTIONAL
  -- This IE is only present for RABs towards the PS domain --,
  iuTransportAssociation IuTransportAssociation OPTIONAL
  -- This IE is only present for RABs towards the PS domain --,
  dl-dataVolumes        DataVolumeList          OPTIONAL
  -- This IE is only present if the RAB has been modified and --
  -- RAB data volume reporting for PS domain is required --,
  iE-Extensions         ProtocolExtensionContainer { {RAB-SetupOrModifiedItem-ExtIEs} }          OPTIONAL,
  ...
}

RAB-SetupOrModifiedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  { ID id-Ass-RAB-Parameters          CRITICALITY ignore          EXTENSION Ass-RAB-Parameters          PRESENCE optional
  -- This IE is only present if any alternative RAB parameter values have been assigned -- },
  ...
}

RAB-ReleasedList ::= RAB-IE-ContainerList { {RAB-ReleasedItemIEs} }

RAB-ReleasedItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleasedItem          CRITICALITY ignore  TYPE RAB-ReleasedItem          PRESENCE mandatory },
  ...
}

RAB-ReleasedItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dl-dataVolumes        DataVolumeList          OPTIONAL
  -- This IE is only present if data volume reporting for PS domain is required --,
  dL-GTP-PDU-SequenceNumber DL-GTP-PDU-SequenceNumber          OPTIONAL
  -- This IE is only present for RABs towards the PS domain when available and when the release is UTRAN initiated -- ,
  uL-GTP-PDU-SequenceNumber UL-GTP-PDU-SequenceNumber          OPTIONAL
  -- This IE is only present for RABs towards the PS domain when available and when the release is UTRAN initiated -- ,
  iE-Extensions         ProtocolExtensionContainer { {RAB-ReleasedItem-ExtIEs} }          OPTIONAL,
  ...
}

RAB-ReleasedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

DataVolumeList ::= SEQUENCE (SIZE (1..maxNrOfVol)) OF
  SEQUENCE {

```

```

dl-UnsuccessfullyTransmittedDataVolume      UnsuccessfullyTransmittedDataVolume,
dataVolumeReference                         DataVolumeReference OPTIONAL,
iE-Extensions                               ProtocolExtensionContainer { {DataVolumeList-ExtIEs} } OPTIONAL,
...
}

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

RAB-QueuedList                               ::= RAB-IE-ContainerList { {RAB-QueuedItemIEs} }

RAB-QueuedItemIEs RANAP-PROTOCOL-IES ::= {
{ ID id-RAB-QueuedItem                       CRITICALITY ignore TYPE RAB-QueuedItem PRESENCE mandatory },
...
}

RAB-QueuedItem ::= SEQUENCE {
rAB-ID                                       RAB-ID,
iE-Extensions                               ProtocolExtensionContainer { {RAB-QueuedItem-ExtIEs} } OPTIONAL,
...
}

RAB-QueuedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
...
}

RAB-ReleaseFailedList ::= RAB-FailedList

RAB-AssignmentResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
...
}

-- *****
--
-- PRIVATE MESSAGE
--
-- *****

PrivateMessage ::= SEQUENCE {
privateIEs PrivateIE-Container { {PrivateMessage-IEs} },
...
}

PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
...
}

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

```

```

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

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

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

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

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

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

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

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

RAB-ContextItem-RANAP-RelocInf ::= SEQUENCE {
    rAB-ID          RAB-ID,
    dl-GTP-PDU-SequenceNumber      DL-GTP-PDU-SequenceNumber      OPTIONAL
    --This IE is only present when available--,
    ul-GTP-PDU-SequenceNumber      UL-GTP-PDU-SequenceNumber      OPTIONAL
    --This IE is only present when available--,
    dl-N-PDU-SequenceNumber        DL-N-PDU-SequenceNumber        OPTIONAL
    --This IE is only present when available--,
    ul-N-PDU-SequenceNumber        UL-N-PDU-SequenceNumber        OPTIONAL
    --This IE is only present when available--,

```

```
    iE-Extensions          ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs-RANAP-RelocInf} } OPTIONAL,
    ...
}

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

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

END
```

9.3.4 Information Element Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxNrOfErrors,
    maxNrOfPDPDirections,
    maxNrOfPoints,
    maxNrOfRABs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination,
    maxNrOfAltValues

FROM RANAP-Constants

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

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

-- A

AllocationOrRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability  Pre-emptionCapability,
    pre-emptionVulnerability  Pre-emptionVulnerability,
    queuingAllowed        QueuingAllowed,
    iE-Extensions         ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
    ...
}

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

```

```

Alt-RAB-Parameters ::= SEQUENCE {
  altMaxBitrateInf           Alt-RAB-Parameter-MaxBitrateInf           OPTIONAL,
  altGuaranteedBitRateInf   Alt-RAB-Parameter-GuaranteedBitrateInf   OPTIONAL,
  iE-Extensions             ProtocolExtensionContainer { {Alt-RAB-Parameters-ExtIEs} } OPTIONAL,
  ...
}

Alt-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
  altGuaranteedBitrateType  Alt-RAB-Parameter-GuaranteedBitrateType,
  altGuaranteedBitrates     Alt-RAB-Parameter-GuaranteedBitrates     OPTIONAL
  -- This IE is only present when a value range or discrete values are given --,
  ...
}

Alt-RAB-Parameter-GuaranteedBitrateType ::= ENUMERATED{
  unspecified,
  value-range,
  discrete-values
  ...
}

Alt-RAB-Parameter-GuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
  Alt-RAB-Parameter-GuaranteedBitrateList

Alt-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

Alt-RAB-Parameter-MaxBitrateInf ::= SEQUENCE {
  altMaxBitrateType         Alt-RAB-Parameter-MaxBitrateType,
  altMaxBitrates            Alt-RAB-Parameter-MaxBitrates            OPTIONAL
  -- This IE is only present when a value range or discrete values are given --,
  ...
}

Alt-RAB-Parameter-MaxBitrateType ::= ENUMERATED{
  unspecified,
  value-range,
  discrete-values
  ...
}

Alt-RAB-Parameter-MaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
  Alt-RAB-Parameter-MaxBitrateList

Alt-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

```



```
AreaIdentity ::= CHOICE {
    sAI                SAI,
    geographicalArea    GeographicalArea,
    ...
}

Ass-RAB-Parameters ::= SEQUENCE {
    assMaxBitrateInf    Ass-RAB-Parameter-MaxBitrateList OPTIONAL
    -- This IE is only present when RAB QoS Negotiation has been performed for the RAB Parameter in question --,
    assGuaranteedBitRateInf    Ass-RAB-Parameter-GuaranteedBitrateList OPTIONAL
    -- This IE is only present when RAB QoS Negotiation has been performed for the RAB Parameter in question --,
    iE-Extensions      ProtocolExtensionContainer { {Ass-RAB-Parameters-ExtIEs} } OPTIONAL,
    ...
}

Ass-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

Ass-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate

Ass-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

-- B

BindingID ::= OCTET STRING (SIZE (4))
```

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

9.3.6 Constant Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

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

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

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

maxNrOfDTs                   INTEGER ::= 15
maxNrOfErrors                 INTEGER ::= 256
maxNrOfIuSigConIds           INTEGER ::= 250
maxNrOfPDPDirections         INTEGER ::= 2
maxNrOfPoints                 INTEGER ::= 15
maxNrOfRABs                   INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfVol                    INTEGER ::= 2
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
<u>id-Alt-RAB-Parameters</u>	<u>INTEGER ::= 88</u>
<u>id-Ass-RAB-Parameters</u>	<u>INTEGER ::= 89</u>

END

CHANGE REQUEST

⌘ **25.413 CR 274** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘ Introduction of RAB QoS Negotiation during Relocation		
Source:	⌘ RAN-WG3		
Work item code:	⌘ QoSPS-MAPEND-RABQoS-Negot	Date:	⌘ Feb 2001
Category:	⌘ B	Release:	⌘ REL-4
	<i>Use one of the following categories:</i> 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.		<i>Use one of the following releases:</i> 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:	⌘ Reflection the Rel4 WI: RAB QoS Negotiation over lu		
Summary of change:	⌘ -The procedure description of Relocation Resource Allocation are added. ⌘ -The Alternative RAB Parameter Values in RELOCATION REQUEST message is added ⌘ -The Assigned RAB Parameter Values in RELOCATION REQUEST ACKNOWLEDGE message is added		
Consequences if not approved:	⌘ This CR is backward compatible.		

Clauses affected:	⌘ 8.7, 9.1.10, 9.1.11, 9.2.1.x, 9.2.1.y, 9.3.3, 9.3.4, 9.3.6		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> 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/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.

8.7 Relocation Resource Allocation

8.7.1 General

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

8.7.2 Successful Operation

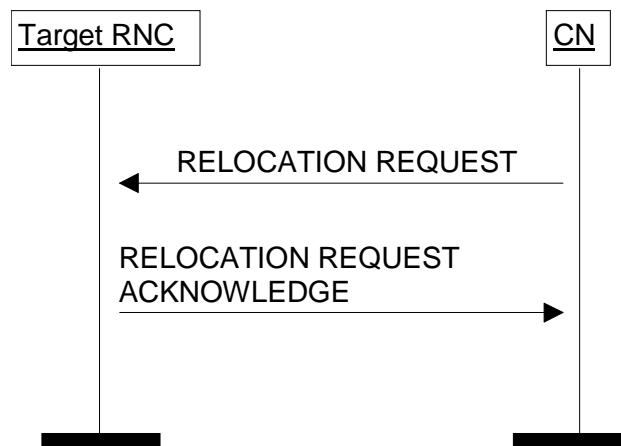


Figure 1: Relocation Resource Allocation procedure. Successful operation.

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

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

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.

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 allocate the resource, 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 exist(s) and can be used for the RAB by 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 allocate the resource, these RAB parameter values shall be included in the RELOCATION REQUEST ACKNOWLEDGE message. This shall not apply to the UTRAN initiated relocation.

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

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

8.7.3 Unsuccessful Operation

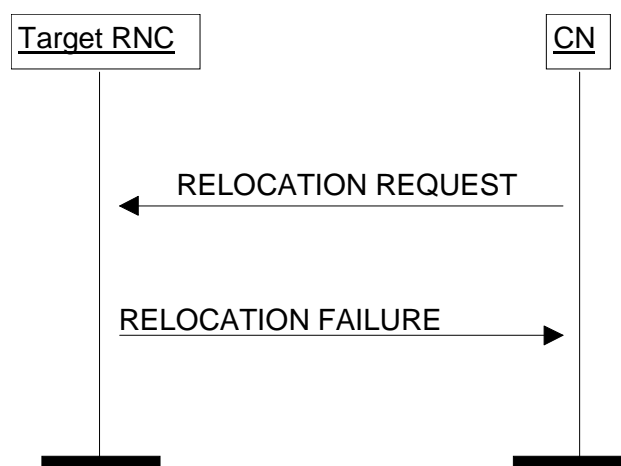


Figure 2: Relocation Resource Allocation procedure: Unsuccessful operation.

If the target RNC can not even partially accept the relocation of SRNS or a failure occurs during the Relocation Resource Allocation procedure in the target RNC, the target RNC shall send RELOCATION FAILURE message to the CN.

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

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

8.7.4 Abnormal Conditions

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

Interactions with Iu Release procedure:

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

8.7.5 Co-ordination of Two Iu Signalling Connections

Co-ordination of two Iu signalling connections during Relocation Resource Allocation procedure shall be executed by the target RNC when the *Number of Iu Instances IE* received in the *Source RNC to Target RNC Transparent Container IE* in the RELOCATION REQUEST message indicates that two CN domains are involved in relocation of SRNS.

If two CN domains are involved, the following actions shall be taken by the target RNC:

- The target RNC shall utilise the *Permanent NAS UE Identity IE*, received explicitly by each CN domain within RELOCATION REQUEST message, to co-ordinate both Iu signalling connections.
- The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE message only after all expected RELOCATION REQUEST messages are received and analysed.
- The target RNC shall ensure that there is no conflicting information in *Target RNC to Source RNC Transparent Container IE* in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via different Iu signalling connections and related to the same relocation of SRNS.
- The selection of signalling connection utilised for the *Target RNC to Source RNC Transparent Container IE* in RELOCATION REQUEST ACKNOWLEDGE message need not to be dependent on the signalling connection via which the *Source RNC to Target RNC Transparent Container IE* in RELOCATION REQUEST message was received.

NEXT CHANGE**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	ignore
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	ignore
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
RABs To Be Setup		0 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		-	
<u>> Alternative RAB Parameter Values</u>	<u>O</u>		<u>9.2.1.x</u>		<u>Yes</u>	<u>Ignore</u>
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

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.

9.1.11 RELOCATION REQUEST ACKNOWLEDGE

This message is sent by the target RNC to inform the CN about the result of the resource allocation for the requested relocation.

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	ignore
Target RNC To Source RNC Transparent Container	C – IfAppINotOtherCN		9.2.1.30		YES	ignore
RABs Setup		0 to <maxnoofRABs			EACH	reject
>RAB ID	M		9.2.1.2		-	
>Transport Layer Address	C – ifPS		9.2.2.1		-	
>lu Transport Association	C – ifPS		9.2.2.2			
>Assigned RAB Parameter Values	C - ifAltValuesAss		9.2.1.y		YES	ignore
RABs Failed To Setup		0 to <maxnoofRABs			EACH	ignore
>RAB ID	M		9.2.1.2		-	
>Cause	M		9.2.1.4		-	
Chosen Integrity Protection Algorithm	C - ifAvail		9.2.1.13	Indicates which algorithm that will be used by the target RNC.	YES	ignore
Chosen Encryption Algorithm	O		9.2.1.14	Indicates which algorithm that will be used by the target RNC.	YES	ignore
Criticality Diagnostics	O		9.2.1.35		YES	ignore

Condition	Explanation
IfPS	This Group is only present for RABs towards the PS domain.
IfAppINotOtherCN	Must be included if applicable and if not sent via the other CN domain.
IfAvail	This IE is only present if available at the sending side.
IfAltValuesAss	This IE is only present if any alternative RAB parameter values have been assigned.

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

9.2.1.x 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.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
<u>Alternative RAB parameter values</u>				
<u>>Alternative Maximum Bit Rate Information</u>	<u>O</u>			Included only if negotiation is allowed for this IE.
<u>>>Type of Alternative Maximum Bit Rate Information</u>	<u>M</u>		<u>ENUMERATED (Unspecified, Value range, Discrete values)</u>	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN.
<u>>>>Alternative Maximum Bit Rates</u>	<u>C - ifValueRangeorDiscreteValues</u>	<u>1 to <nbr-AlternativeValues></u>		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.
<u>>>>>Bit Rate</u>	<u>M</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (1..16,000,000)</u>	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
<u>>Alternative Guaranteed Bit Rate Information</u>	<u>O</u>			Included only if negotiation is allowed for this IE.
<u>>>Type of Alternative Guaranteed Bit Rate Information</u>	<u>M</u>		<u>ENUMERATED (Unspecified, Value range, Discrete values)</u>	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN.
<u>>>>Alternative Guaranteed Bit Rates</u>	<u>C - ifValueRangeorDiscreteValues</u>	<u>1 to <nbr-AlternativeValues></u>		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.
<u>>>>>Bit Rate</u>	<u>M</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (0..16,000,000)</u>	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.

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

<u>Condition</u>	<u>Explanation</u>
<u>ifValueRangeorDiscreteValues</u>	<u>This IE is only present when a value range or discrete values are given.</u>

9.2.1.y Assigned RAB Parameter Values

The purpose of the *Assigned RAB Parameter Values* IE is to indicate that RAB QoS negotiation has been performed for certain RAB parameters and which values that have been chosen.

<u>IE/Group Name</u>	<u>Presence</u>	<u>Range</u>	<u>IE type and reference</u>	<u>Semantics description</u>
Assigned RAB parameter values				
<u>>Assigned Maximum Bit Rate</u>	<u>C - ifNegPerf</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (1..16,000,000)</u>	<u>When nbr-SeparateTrafficDirections is equal to 2, then Assigned Maximum Bit Rate attribute for downlink is signalled first, then Assigned Maximum Bit Rate attribute for uplink.</u>
<u>>Assigned Guaranteed Bit Rate</u>	<u>C - ifNegPerf</u>	<u>1 to <nbr-SeparateTrafficDirections></u>	<u>INTEGER (0..16,000,000)</u>	<u>When nbr-SeparateTrafficDirections is equal to 2, then Assigned Guaranteed Bit Rate for downlink is signalled first, then Assigned Guaranteed Bit Rate for uplink.</u>

<u>Range Bound</u>	<u>Explanation</u>
<u>nbr-SeparateTrafficDirection</u>	<u>Number of Traffic Directions being signalled separately. Set to 2 if RAB asymmetry indicator is asymmetric bidirectional. Set to 1 in all other cases.</u>

<u>Condition</u>	<u>Explanation</u>
<u>ifNegPerf</u>	<u>This IE is only present when RAB QoS Negotiation has been performed for the RAB Parameter in question.</u>

9.3.3 PDU Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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



```

PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
SAI,
SAPI,
Service-Handover,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,
UE-ID,
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-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-QueuedItem,
id-RAB-QueuedList,
id-RAB-ReleaseFailedList,
id-RAB-ReleaseItem,
id-RAB-ReleasedItem-IuRelComp,
id-RAB-ReleaseList,

```

id-RAB-ReleasedItem,
id-RAB-ReleasedList,
id-RAB-ReleasedList-IuRelComp,
id-RAB-RelocationReleaseItem,
id-RAB-RelocationReleaseList,
id-RAB-SetupItem-RelocReq,
id-RAB-SetupItem-RelocReqAck,
id-RAB-SetupList-RelocReq,
id-RAB-SetupList-RelocReqAck,
id-RAB-SetupOrModifiedItem,
id-RAB-SetupOrModifiedList,
id-RAB-SetupOrModifyItem,
id-RAB-SetupOrModifyList,
id-RAC,
id-RelocationType,
id-RequestType,
id-SAI,
id-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;

-- *****
--
-- Common Container Lists
--
-- *****

RAB-IE-ContainerList          { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfRABs, {IEsSetParam} }
RAB-IE-ContainerPairList     { RANAP-PROTOCOL-IES-PAIR : IEsSetParam } ::= ProtocolIE-ContainerPairList { 1, maxNrOfRABs, {IEsSetParam} }
ProtocolError-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfRABs, {IEsSetParam} }
IuSigConId-IE-ContainerList  { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfIuSigConIds, {IEsSetParam} }
DirectTransfer-IE-ContainerList { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList { 1, maxNrOfDTs, {IEsSetParam} }

-- *****
--
-- Iu RELEASE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Iu Release Command

```

```

--
-- *****
Iu-ReleaseCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {Iu-ReleaseCommandIEs} },
    protocolExtensions   ProtocolExtensionContainer { {Iu-ReleaseCommandExtensions} }          OPTIONAL,
    ...
}

Iu-ReleaseCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause          CRITICALITY ignore  TYPE Cause          PRESENCE mandatory },
    ...
}

Iu-ReleaseCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- *****
--
-- Iu Release Complete
--
-- *****

Iu-ReleaseComplete ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {Iu-ReleaseCompleteIEs} },
    protocolExtensions   ProtocolExtensionContainer { {Iu-ReleaseCompleteExtensions} }          OPTIONAL,
    ...
}

Iu-ReleaseCompleteIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportList      CRITICALITY ignore  TYPE RAB-DataVolumeReportList      PRESENCE conditional
    -- This group is only present if data volume reporting for PS domain is required -- } |
    { ID id-RAB-ReleasedList-IuRelComp    CRITICALITY ignore  TYPE RAB-ReleasedList-IuRelComp    PRESENCE conditional
    -- This group is only present for RABs towards the PS domain when sequence numbers are available and when the release was initiated by UTRAN -- } |
    { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics        PRESENCE optional    },
    ...
}

RAB-DataVolumeReportList ::= RAB-IE-ContainerList { {RAB-DataVolumeReportItemIEs} }

RAB-DataVolumeReportItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportItem      CRITICALITY ignore  TYPE RAB-DataVolumeReportItem      PRESENCE mandatory    },
    ...
}

RAB-DataVolumeReportItem ::= SEQUENCE {
    rAB-ID          RAB-ID,
    dl-UnsuccessfullyTransmittedDataVolume  DataVolumeList  OPTIONAL
    -- This IE is only present if data volume reporting for PS domain is required --,
    iE-Extensions   ProtocolExtensionContainer { {RAB-DataVolumeReportItem-ExtIEs} }          OPTIONAL,
    ...
}

```

```

}
RAB-DataVolumeReportItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
RAB-ReleasedList-IuRelComp ::= RAB-IE-ContainerList { {RAB-ReleasedItem-IuRelComp-IEs} }
RAB-ReleasedItem-IuRelComp-IEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-ReleasedItem-IuRelComp          CRITICALITY ignore TYPE RAB-ReleasedItem-IuRelComp          PRESENCE mandatory },
  ...
}
RAB-ReleasedItem-IuRelComp ::= SEQUENCE {
  rAB-ID                RAB-ID,
  dL-GTP-PDU-SequenceNumber DL-GTP-PDU-SequenceNumber OPTIONAL
  --This IE is only present when available--,
  uL-GTP-PDU-SequenceNumber UL-GTP-PDU-SequenceNumber OPTIONAL
  --This IE is only present when available--,
  iE-Extensions         ProtocolExtensionContainer { {RAB-ReleasedItem-IuRelComp-ExtIEs} } OPTIONAL,
  ...
}
RAB-ReleasedItem-IuRelComp-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

Iu-ReleaseCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- *****
--
-- RELOCATION PREPARATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- Relocation Required
--
-- *****

RelocationRequired ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container { {RelocationRequiredIEs} },
  protocolExtensions  ProtocolExtensionContainer { {RelocationRequiredExtensions} } OPTIONAL,
  ...
}

RelocationRequiredIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RelocationType          CRITICALITY ignore TYPE RelocationType          PRESENCE mandatory } |
  { ID id-Cause                    CRITICALITY ignore TYPE Cause                    PRESENCE mandatory } |

```

```

{ ID id-SourceID                CRITICALITY ignore  TYPE SourceID                PRESENCE mandatory } |
{ ID id-TargetID                CRITICALITY reject  TYPE TargetID                PRESENCE mandatory } |
{ ID id-ClassmarkInformation2    CRITICALITY ignore  TYPE ClassmarkInformation2    PRESENCE conditional
-- This is only present when initiating an inter system handover towards GSM BSC -- } |
{ ID id-ClassmarkInformation3    CRITICALITY ignore  TYPE ClassmarkInformation3    PRESENCE conditional
-- This is only present when initiating an inter system handover towards GSM BSC -- } |
{ ID id-SourceRNC-ToTargetRNC-TransparentContainer
          CRITICALITY reject  TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE conditional
-- This IE shall be present when initiating relocation of SRNS -- } |
{ ID id-OldBSS-ToNewBSS-Information    CRITICALITY ignore  TYPE OldBSS-ToNewBSS-Information    PRESENCE conditional
-- This is only present when initiating an inter system handover towards GSM BSC -- } ,
...
}

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

-- *****
--
-- Relocation Command
--
-- *****

RelocationCommand ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {RelocationCommandIEs} },
  protocolExtensions   ProtocolExtensionContainer { {RelocationCommandExtensions} }          OPTIONAL,
  ...
}

RelocationCommandIEs RANAP-PROTOCOL-IES ::= {
  { ID id-TargetRNC-ToSourceRNC-TransparentContainer
          CRITICALITY reject  TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE conditional
-- This IE shall be included if it is received by the CN from the relocation target. -- } |
  { ID id-L3-Information                CRITICALITY ignore  TYPE L3-Information                PRESENCE conditional
-- This IE shall be included if it is received by the CN from the relocation target. -- } |
  { ID id-RAB-RelocationReleaseList      CRITICALITY ignore  TYPE RAB-RelocationReleaseList      PRESENCE optional } |
  { ID id-RAB-DataForwardingList         CRITICALITY ignore  TYPE RAB-DataForwardingList         PRESENCE conditional
-- This group if applicable is only present for RABs towards the PS domain -- } |
  { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
  ...
}

RAB-RelocationReleaseList ::= RAB-IE-ContainerList { {RAB-RelocationReleaseItemIEs} }

RAB-RelocationReleaseItemIEs RANAP-PROTOCOL-IES ::= {
  { ID id-RAB-RelocationReleaseItem      CRITICALITY ignore  TYPE RAB-RelocationReleaseItem      PRESENCE mandatory },
  ...
}

RAB-RelocationReleaseItem ::= SEQUENCE {
  rAB-ID                RAB-ID,
  iE-Extensions         ProtocolExtensionContainer { {RAB-RelocationReleaseItem-ExtIEs} }          OPTIONAL,

```

```

    ...
}

RAB-RelocationReleaseItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-DataForwardingList ::= RAB-IE-ContainerList { {RAB-DataForwardingItemIEs} }

RAB-DataForwardingItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingItem          CRITICALITY ignore  TYPE RAB-DataForwardingItem          PRESENCE mandatory },
    ...
}

RAB-DataForwardingItem ::= SEQUENCE {
    rAB-ID                RAB-ID,
    transportLayerAddress TransportLayerAddress,
    iuTransportAssociation IuTransportAssociation,
    iE-Extensions         ProtocolExtensionContainer { {RAB-DataForwardingItem-ExtIEs} }          OPTIONAL,
    ...
}

RAB-DataForwardingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

-- *****
--
-- Relocation Preparation Failure
--
-- *****

RelocationPreparationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container { {RelocationPreparationFailureIEs} },
    protocolExtensions   ProtocolExtensionContainer { {RelocationPreparationFailureExtensions} }          OPTIONAL,
    ...
}

RelocationPreparationFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                CRITICALITY ignore  TYPE Cause                PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

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

-- *****

```

```

--
-- 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 ignore  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 ::= {
  ...
}

-- *****
--
-- Relocation Request Acknowledge
--
-- *****

RelocationRequestAcknowledge ::= SEQUENCE {
  protocolIEs             ProtocolIE-Container    { {RelocationRequestAcknowledgeIEs} },
  protocolExtensions      ProtocolExtensionContainer { {RelocationRequestAcknowledgeExtensions} }    OPTIONAL,
  ...
}

RelocationRequestAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
  { ID id-TargetRNC-ToSourceRNC-TransparentContainer
    CRITICALITY ignore    TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE conditional
    -- Must be included if applicapble and if not sent via the other CN -- } |
  { ID id-RAB-SetupList-RelocReqAck    CRITICALITY ignore    TYPE RAB-SetupList-RelocReqAck    PRESENCE optional } |
  { ID id-RAB-FailedList                CRITICALITY ignore    TYPE RAB-FailedList                PRESENCE optional } |
  { ID id-ChosenIntegrityProtectionAlgorithm CRITICALITY ignore    TYPE ChosenIntegrityProtectionAlgorithm    PRESENCE conditional
    -- This IE is only present if available at the sending side -- } |
  { ID id-ChosenEncryptionAlgorithm    CRITICALITY ignore    TYPE ChosenEncryptionAlgorithm    PRESENCE optional } |
  { ID id-CriticalityDiagnostics        CRITICALITY ignore    TYPE CriticalityDiagnostics        PRESENCE optional },
  ...
}

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

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

```

```

}

RAB-SetupItem-RelocReqAck ::= SEQUENCE {
    rAB-ID                RAB-ID,
    transportLayerAddress TransportLayerAddress OPTIONAL,
    --This IE is only present for RABS towards the PS Domain
    iuTransportAssociation IuTransportAssociation OPTIONAL,
    --This IE is only present for RABS towards the PS Domain
    iE-Extensions        ProtocolExtensionContainer { {RAB-SetupItem-RelocReqAck-ExtIEs} } OPTIONAL,
    ...
}

RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    { ID id-Ass-RAB-Parameters CRITICALITY ignore EXTENSION Ass-RAB-Parameters PRESENCE optional
    -- This IE is only present if any alternative RAB parameter values have been assigned --} ,
    ...
}

RAB-FailedList ::= RAB-IE-ContainerList { {RAB-FailedItemIEs} }

RAB-FailedItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-FailedItem CRITICALITY ignore TYPE RAB-FailedItem PRESENCE mandatory },
    ...
}

RAB-FailedItem ::= SEQUENCE {
    rAB-ID                RAB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { {RAB-FailedItem-ExtIEs} } OPTIONAL,
    ...
}

RAB-FailedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

```

LOTS OF UNAFFECTED ASN.1 DESCRIPTION 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,
    maxNrOfAltValues

FROM RANAP-Constants

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

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

-- A

AllocationOrRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability  Pre-emptionCapability,
    pre-emptionVulnerability  Pre-emptionVulnerability,
    queuingAllowed         QueuingAllowed,
    iE-Extensions          ProtocolExtensionContainer { {AllocationOrRetentionPriority-ExtIEs} } OPTIONAL,
    ...
}

AllocationOrRetentionPriority-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...

```

```

}
Alt-RAB-Parameters ::= SEQUENCE {
  altMaxBitrateInf           Alt-RAB-Parameter-MaxBitrateInf           OPTIONAL,
  altGuaranteedBitRateInf    Alt-RAB-Parameter-GuaranteedBitrateInf    OPTIONAL,
  iE-Extensions              ProtocolExtensionContainer { {Alt-RAB-Parameters-ExtIEs} } OPTIONAL,
  ...
}
Alt-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
  altGuaranteedBitrateType    Alt-RAB-Parameter-GuaranteedBitrateType,
  altGuaranteedBitrates       Alt-RAB-Parameter-GuaranteedBitrates       OPTIONAL
  -- This IE is only present when a value range or discrete values are given --,
  ...
}
Alt-RAB-Parameter-GuaranteedBitrateType ::= ENUMERATED{
  unspecified,
  value-range,
  discrete-values,
  ...
}
Alt-RAB-Parameter-GuaranteedBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
  Alt-RAB-Parameter-GuaranteedBitrateList
Alt-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
Alt-RAB-Parameter-MaxBitrateInf ::= SEQUENCE {
  altMaxBitrateType           Alt-RAB-Parameter-MaxBitrateType,
  altMaxBitrates              Alt-RAB-Parameter-MaxBitrates              OPTIONAL
  -- This IE is only present when a value range or discrete values are given --,
  ...
}
Alt-RAB-Parameter-MaxBitrateType ::= ENUMERATED{
  unspecified,
  value-range,
  discrete-values,
  ...
}
Alt-RAB-Parameter-MaxBitrates ::= SEQUENCE (SIZE (1..maxNrOfAltValues)) OF
  Alt-RAB-Parameter-MaxBitrateList
Alt-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate

```

```
AreaIdentity ::= CHOICE {
    sAI          SAI,
    geographicalArea    GeographicalArea,
    ...
}

Ass-RAB-Parameters ::= SEQUENCE {
    assMaxBitrates          Ass-RAB-Parameter-MaxBitrateList          OPTIONAL
    -- This IE is only present when RAB QoS Negotiation has been preformed for RAB Parameter in question --,
    assGuaranteedBitrates    Ass-RAB-Parameter-GuaranteedBitrateList    OPTIONAL
    -- This IE is only present when RAB QoS Negotiation has been preformed for RAB Parameter in question --,
    iE-Extensions          ProtocolExtensionContainer { {Ass-RAB-Parameters-ExtIEs} } OPTIONAL,
    ...
}

Ass-RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

Ass-RAB-Parameter-GuaranteedBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF GuaranteedBitrate
Ass-RAB-Parameter-MaxBitrateList ::= SEQUENCE (SIZE (1..maxNrOfSeparateTrafficDirections)) OF MaxBitrate
```

LOTS OF UNAFFECTED ASN.1 DESCRIPTION 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

```

```

-- *****
--
-- 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
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-Alt-RAB-Parameters	INTEGER ::= 88
<u>id-Ass-RAB-Parameters</u>	<u>INTEGER ::= 89</u>

END