

TSG RAN Meeting #26
Vouliagmeni Athens, Greece, 08 - 10 December 2004

RP-040442

Title CR (Rel-6 Category B) to TS 25.413 on network-initiated SCUDIF in Release 6 - proposal 1
Source TSG RAN WG3
Agenda Item 8.9

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	CR	Rev	Cat	Rel	Title	Work item
R3-041718	25.413	6.3.0	6.4.0	712	1	B	Rel-6	Basic Support of Network-initiated Scudif in release 6	TEI6

Note: This CR was endorsed as 'technically correct' in RAN3 (instead of being 'agreed')

CHANGE REQUEST

⌘ **TS25.413 CR CR712** ⌘ rev **1** ⌘ Current version: **6.3.0** ⌘

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

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

Title:	⌘ Basic Support of Network-initiated Scudif		
Source:	⌘ RAN3		
Work item code:	⌘ TEI6	Date:	⌘ 19/11/2004
Category:	⌘ B	Release:	⌘ REL-6
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>Ph2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> <p>Rel-7 (Release 7)</p>

Reason for change:	<p>⌘ The current support for the Release 6 network-initiated SCUDIF from lu interface perspective does not completely fulfill the stage 1 requirements for the following main reasons:</p> <ul style="list-style-type: none"> - There is no solution/support for network initiated service change from speech to multimedia. - The current solution for the network initiated fallback from multimedia to speech is not the best one as it relies on difficult assumptions: <ul style="list-style-type: none"> o The usage of certain value of the <i>Service Handover</i> IE field, because it is misused to enable the trigger of handover upon detection of lack of resource instead of preventing it. o The reuse of relocation messages to signal the need to fallback to speech whereas the radio conditions for the fallback may be set differently compared to relocation. <p>The lack of clear indication for the CN to understand that a fallback process is requested when it receives the RANAP RELOCATION REQUIRED message from the RNC because it cannot differentiate from a usual radio reason handover.</p>
Summary of change:	<p>⌘ The indications of fallback available and/or upgrade added in RAB Assignment and Relocation Request and the trigger to change added in the RAB Modify Request message.</p> <p>Signalling scenarios and related textual clarifications are added to describe</p> <ul style="list-style-type: none"> - a mechanism for the MSC to indicate to the RNC the support of receiving

and utilizing an indication of radio conditions;

- o A new optional flag indicating the fallback possibility in the *Alternative RAB Parameter Values* IE (thus included in RAB ASSIGNMENT REQUEST or RELOCATION REQUEST message).
 - o A new optional indication of the possibility for upgrade to a certain RAB configuration based on provided alternative full RAB parameters set in the *Alternative RAB Parameter Values* IE (thus included in RAB ASSIGNMENT REQUEST or RELOCATION REQUEST message).
- a mechanism for the RNC to indicate to the MSC the existence of suitable conditions for a fallback or upgrade for a given RAB (RAB MODIFY REQUEST message with new optional IE in the extension container of the IE group *Requested RAB Parameter Values*).

Consequences if not approved: ☞ Fallback to speech or upgrade to multimedia not possible or not done at proper time.

Clauses affected: ☞ 2, 8.2, 8.7, 8.30, 9.1.46, 9.2.1.43, 9.2.1.45, 9.3.4 and 9.3.6

Other specs affected:

Y	N
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Other core specifications ☞

Test specifications

O&M Specifications

Other comments: ☞

How to create CRs using this form:

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

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

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 23.930 (version.4.0.0, 2001-04): "Iu Principles".
- [2] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [3] 3GPP TS 25.401: "UTRAN Overall Description".
- [4] 3GPP TR 25.931: "UTRAN Functions, Examples on Signalling Procedures".
- [5] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [6] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [7] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [8] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [9] 3GPP TS 25.414: "UTRAN Iu interface data transport and transport signalling".
- [10] 3GPP TS 25.331: Radio Resource Control (RRC) protocol specification".
- [11] 3GPP TS 48.008: "Mobile Switching Centre – Base Station System (MSC - BSS) interface; Layer 3 specification".
- [12] GSM TS 12.08: "Subscriber and equipment trace".
- [13] ITU-T Recommendation X.691 (1997): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".
- [14] ITU-T Recommendation X.680 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [15] ITU-T Recommendation X.681 (1997): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [16] 3GPP TS 23.110: "UMTS Access Stratum, Services and Functions".
- [17] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
- [18] 3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".
- [19] 3GPP TS 23.003: "Numbering, addressing and identification".
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [22] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary services specification; Formats and coding".
- [23] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

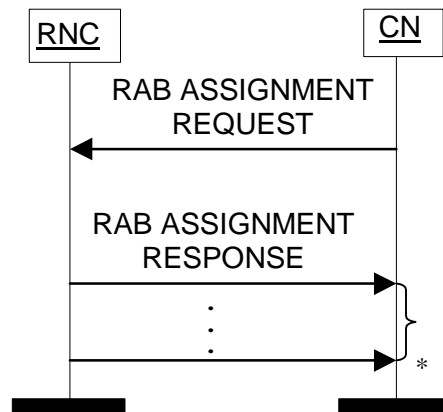
- [24] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [25] GSM TS 12.20: "Base Station System (BSS) management information".
- [26] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".
- [27] 3GPP TS 43.051: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Overall description - Stage 2".
- [28] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services (LCS) in UTRAN".
- [29] 3GPP TS 43.059: "Functional stage 2 description of Location Services (LCS) in GERAN".
- [30] 3GPP TS 22.071: "Location Services (LCS); Service description - Stage 1".
- [31] 3GPP TR 25.994: "Measures employed by the UMTS Radio Access Network (UTRAN) to overcome early User Equipment (UE) implementation faults".
- [32] 3GPP TR 25.995: "Measures employed by the UMTS Radio Access Network (UTRAN) to cater for legacy User Equipment (UE) which conforms to superseded versions of the RAN interface specification".
- [33] 3GPP TS 23.195: "Provision of UE Specific Behaviour Information to Network Entities".
- [34] 3GPP TS 49.031: "Location Services (LCS) – Base Station System Application Part LCS Extension – (BSSAP-LE)".
- [35] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [36] 3GPP TS 48.018: "General Packet Radio Service (GPRS); BSS GPRS Protocol (BSSGP)".
- [37] 3GPP TS 32.421: "Subscriber and equipment trace: Trace concepts and requirements".
- [38] 3GPP TS 32.422: "Subscriber and equipment trace: Trace control and Configuration Management"
- [r1] [3GPP TS 23.172: "Technical realization of Circuit Switched \(CS\) multimedia service UDI/RDI fallback and service modification; Stage 2"](#)

8.2 RAB Assignment

8.2.1 General

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

8.2.2 Successful Operation



* it can be several responses

Figure 1: RAB Assignment procedure. Successful operation.

The CN initiates 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 the UTRAN to:

- establish,
- modify,
- release

one or several RABs with one RAB ASSIGNMENT REQUEST message.

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

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

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

For each RAB requested to be established, the message shall contain:

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

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

For each RAB requested to be modified, the message may contain:

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

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

At a RAB modification that does not include transfer of the *NAS Synchronisation Indicator* IE, the *RAB Parameters* IE shall be present in the RAB ASSIGNMENT REQUEST message only when any previously set value for this IE is requested to be modified.

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

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

For a RAB setup, the *RAB Parameters* IE may contain the *Signalling Indication* IE. The *Signalling Indication* IE shall not be present if the *Traffic Class* IE is not set to "Interactive" or if the *CN Domain Indicator* IE is not set to "PS domain".

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

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

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

For each RAB requested to be released, the message shall contain:

- RAB ID;
- Cause.

Upon reception of the RAB ASSIGNMENT REQUEST message, the 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. [It may also indicate in the Alternative RAB Parameter](#)

Values IE if a fallback and/or a RAB upgrade possibility for this RAB is available i.e. via the *Fallback Possibility Indication IE* and/or the *Upgrade Possibility Indication IE*, which includes an alternative set of RAB parameters for the expected upgraded RAB.

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

The RAB ID shall uniquely identify the RAB for the specific CN domain and 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 the *RAB ID IE* to the radio interface protocol for each RAB requested to be established or modified.

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

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

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

If included, the *Service Handover IE* tells if the requested RAB

- should be handed over to GSM, i.e. from a NAS point of view, the requested 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 the UTRAN.

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

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

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

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

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

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

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

For each RAB successfully established towards the PS domain or towards the CS domain when an ALCAP is not used, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the RAB ASSIGNMENT RESPONSE message.

For each RAB successfully released towards the PS domain, for which data volume reporting had been requested when the RAB was established, the RNC shall include the *DL Data Volumes* IE in the RAB ASSIGNMENT RESPONSE message. The *DL Data Volumes* IE shall contain in the *Unsuccessfully Transmitted DL Data Volume* IE the total amount of unsuccessfully transmitted DL data for the RAB since its establishment and may contain the *Data Volume Reference* IE.

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

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

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

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

For the CS domain, when an ALCAP is used, UTRAN shall report the successful outcome of a specific RAB to establish or modify only after the Iu user plane at RNL level is ready to be used in UL and DL. At a RAB establishment, the transport network control plane signalling required to set up the transport bearer shall use the *Transport Layer Address* IE and *Iu Transport Association* IE. At a RAB modification when *Transport Layer Address* (IE) and *Iu Transport Association* IEs are included, the RNC shall establish a new transport bearer. The transport network control plane signalling shall then use the included *Transport Layer Address* IE and *Iu Transport Association*

IE. Then the switch over to this new transport bearer shall be done immediately after transport bearer establishment and initialisation of the user plane mode. If *Transport Layer Address* (IE) and *Iu Transport Association* IEs are not included, then the RNC may modify the already existing transport bearer.

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

Before reporting the successful outcome of a specific RAB to establish or modify, the RNC shall have executed the initialisation of the user plane, if necessary.

Re-initialisation of the user plane shall not be performed if:

- the *RAB Parameters* IE is not included, for example during transfer of *NAS Synchronisation Indicator* IE;
- the *RAB Parameters* IE is included but the *SDU Format Information Parameter* IE is not changed for the existing RAB and the *NAS Synchronisation Indicator* IE is not included.

Re-initialisation of the user plane shall be performed if the *RAB Parameters* IE and *NAS Synchronisation Indicator* IE are included.

If the RNC can not initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the rules for initialisation of the respective user plane mode versions, as described in [6], the RAB Assignment shall fail with the cause value "RNC unable to establish all RFCs".

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

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

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

For each RAB that is queued the following outcomes are possible:

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

For RABs indicated as queued in the first RAB ASSIGNMENT RESPONSE message, the 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. The 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 the CN and the UTRAN when all RABs have been responded to.

When the CN receives the response that one or several RABs are queued, it shall expect the 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 case the timer $T_{QUEUING}$ expires, the RAB Assignment procedure terminates in the UTRAN for all queued RABs, and the UTRAN shall respond for all of them in one RAB ASSIGNMENT RESPONSE message. The RAB Assignment procedure shall also be terminated in the CN.

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

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

When UTRAN reports unsuccessful establishment/modification of a RAB, the cause value should be precise enough to enable the core network to know the reason for unsuccessful establishment/modification. Typical cause values are:

"Requested Traffic Class not Available", "Invalid RAB Parameters Value", "Requested Maximum Bit Rate not Available", "Requested Maximum Bit Rate for DL not Available", "Requested Maximum Bit Rate for UL not Available", "Requested Guaranteed Bit Rate not Available", "Requested Guaranteed Bit Rate for DL not Available", "Requested Guaranteed Bit Rate for UL not Available", "Requested Transfer Delay not Achievable", "Invalid RAB Parameters Combination", "Condition Violation for SDU Parameters", "Condition Violation for Traffic Handling Priority", "Condition Violation for Guaranteed Bit Rate", "User Plane Versions not Supported", "Iu UP Failure", "Iu Transport Connection Failed to Establish", "T_{QUEUING} Expiry".

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 a RAB ASSIGNMENT RESPONSE message with a RAB ID included in the list of RABs failed to setup and a cause value of "Directed Retry".

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

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

8.7 Relocation Resource Allocation

8.7.1 General

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

8.7.2 Successful Operation

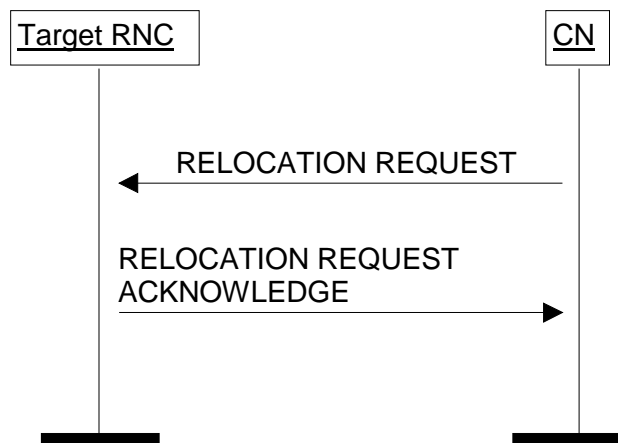


Figure 7: Relocation Resource Allocation procedure. Successful operation.

The CN initiates the procedure by generating a RELOCATION REQUEST message. In a UTRAN to UTRAN relocation, the message shall contain the information (if any) required by the UTRAN to build the same set of RABs as existing for the UE before the relocation. The CN may indicate that RAB QoS negotiation is allowed for certain RAB parameters and in some cases also which alternative values to be used in the negotiation. [It may also indicate in the Alternative RAB Parameter Values IE if a fallback and/or a RAB upgrade possibility for this RAB is available i.e. via the Fallback Possibility Indication IE and/or the Upgrade Possibility Indication IE, which includes an alternative set of RAB parameters for the expected upgraded RAB.](#)

When the CN transmits the RELOCATION REQUEST message, it shall start the timer $T_{RELOCalloc}$.

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

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

The RELOCATION REQUEST message shall contain the following IEs:

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

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

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

The RELOCATION REQUEST message may include the following IE:

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

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

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

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* IE;
- *User plane Information* IE (i.e. required User Plane Mode and required User Plane Versions);
- *Priority level* IE, *Queuing Allowed* IE, *Pre-emption Capability* IE and *Pre-emption Vulnerability* IE;
- *Service Handover* IE.

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

For a RAB setup, the *RAB Parameters* IE may contain the *Signalling Indication* IE. The *Signalling Indication* IE shall not be present if the *Traffic Class* IE is not set to "Interactive" or if the *CN Domain Indicator* IE is not set to "PS domain".

If the RELOCATION REQUEST message includes the Permanent NAS UE identity (i.e. IMSI), the RNC shall associate the permanent identity to the RRC Connection of that user and shall save it for the duration of the RRC connection.

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

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

The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN. The value for the *Iu Signalling Connection Identifier* IE shall be allocated so as to uniquely identify an Iu signalling connection for the involved CN node. The RNC shall store and remember this identifier for the duration of the Iu connection.

The RNC shall, if supported, use the *UESBI-Iu* IE when included in the RELOCATION REQUEST message.

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

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

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

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

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

In case of intra-system relocation, when a *Trace Recording Session Information IE* is provided within the *Source RNC to Target RNC Transparent Container IE*, the Target RNC should store that information to include it in a potential future Trace Record for that UE.

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

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

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

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

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

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

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

Parameter Values IE. It should be noted that the usage of alternative RAB parameter values is not applicable to the UTRAN initiated relocation of type "UE not involved in relocation of SRNS".

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

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

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

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

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

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

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

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

In case of intra-system relocation, the RNC shall include the *Chosen Integrity Protection Algorithm* IE (*Chosen Encryption Algorithm* IE respectively) within the RELOCATION REQUEST ACKNOWLEDGE message, if, and only if the *Integrity Protection Key* IE (*Ciphering Key* IE respectively) was included within the *Source RNC-to-Target RNC transparent container* IE.

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

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

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

If the *SNA Access Information* IE is not contained in the RELOCATION REQUEST message, the target RNC shall consider that no access restriction applies to the UE in the UTRAN.

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

Before reporting the successful outcome of the Relocation Resource allocation procedure, the RNC shall have executed the initialisation of the user plane mode as requested by the CN in the *User Plane Mode* IE. If the RNC can not initialise the requested user plane mode for any of the user plane mode versions in the *UP Mode Versions* IE according to the

rules for initialisation of the respective user plane mode versions, as described in [6], the RAB Relocation shall fail with the cause value "RNC unable to establish all RFCs".

8.30 RAB Modification Request

8.30.1 General

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

8.30.2 Successful Operation

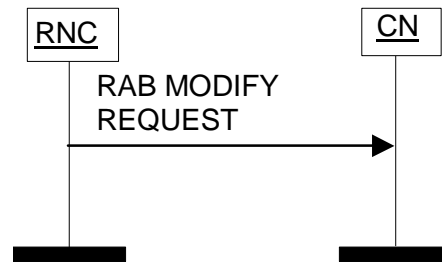


Figure 36: RAB Modification procedure.

The RNC initiates the procedure by generating a RAB MODIFY REQUEST message towards the CN and shall include a list of *RABs To Be Modified* IEs. For each RAB requested to be modified the *RABs To Be Modified Item* IE of the RAB MODIFY REQUEST message shall include the *RAB ID* IE, and the corresponding *Requested RAB Parameter Values* IE. The *Requested RAB Parameter Values* IE shall [either](#) list those RAB parameters the RNC would like modified and the associated new RAB parameter values it is requesting [or shall indicate that a fallback or upgrade is requested for this RAB](#). For any given RAB, the 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.

Interactions with RAB Assignment or Relocation Resource Allocation procedure:

[The RAB Configuration Change Request IE shall only be included in the Requested RAB Parameter Values IE for a given RAB in the RAB MODIFY REQUEST message towards the CN, if CN previously included the Fallback Possibility Indication IE and/or the Upgrade Request IE in the Alternative RAB Parameter Values IE for this RAB at its last modification or setup in corresponding RAB ASSIGNMENT REQUEST or RELOCATION REQUEST message.](#)

8.30.3 Abnormal Conditions

Not applicable.

9.1.46 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.

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 Modified List	M				YES	Ignore
>RABs To Be Modified Item IEs		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		9.2.1.45	Includes either RAB parameters for which different values than what was originally negotiated are being requested, or the indication that a fallback or upgrade can be initiated by CN.	-	

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

9.2.1.43 Alternative RAB Parameter Values

The purpose of the *Alternative RAB Parameter Values* IE is to indicate that:

- [Either](#) RAB QoS negotiation is allowed for certain RAB parameters and, in some cases, to indicate also which alternative values to be used in the negotiation

- [Or that an alternative RAB configuration can be later requested by the RNC.](#)

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative RAB parameter values				
>Alternative Maximum Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Maximum Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.
>>Alternative Maximum Bit Rates	C - ifValueRangeorDiscreteValuesM BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Maximum Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
>Alternative Guaranteed Bit Rate Information	O			Included only if negotiation is allowed for this IE.
>>Type of Alternative Guaranteed Bit Rate Information	M		ENUMERATED (Unspecified, Value range, Discrete values)	Unspecified means that negotiation is allowed, but no alternative values are provided from the CN i.e. the RNC is allowed to assign any value equal or below the ones indicated in the <i>RAB Parameters</i> IE.
>>Alternative Guaranteed Bit Rates	C ifValueRangeorDiscreteValuesG BR	1 to <nbr-Alternative Values>		For Value Range, one value limit is given here and the other given by Guaranteed Bit Rate in the <i>RAB Parameters</i> IE. For Discrete Values, 1 to 16 discrete values can be given.
>>>Bit Rate	M	1 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, then the Bit Rate attribute for downlink is signalled first, then the Bit Rate attribute for uplink.
>Fallback Possibility Indication	O		ENUMERATED (Fallback, ...)	Indicates the possibility for RNC to request CN for a fallback, e.g. to speech as described in [1].
>Upgrade Possibility Indication	O		9.2.1.3	Indicates the possibility for RNC to request CN for an upgrade, e.g. to multimedia as described in [1]. It also includes the alternative set of RAB parameters for the RAB the RNC may request an upgrade to.

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

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

9.2.1.45 Requested RAB Parameter Values

The purpose of *Requested RAB Parameter Values* IE is to [either](#) indicate the RAB parameters for which [the included](#) different values are being requested, ~~as well as those different RAB parameter values~~ [or the indication that a fallback or upgrade can be initiated by CN.](#)

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Requested RAB Parameter Values				
>Requested Maximum Bit Rate	O	0 to <nbr-SeparateTrafficDirections>	INTEGER (1..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, Requested Maximum Bit Rate attribute for downlink is signalled first, then Requested Maximum Bit Rate attribute for uplink.
>Requested Guaranteed Bit Rate	O	0 to <nbr-SeparateTrafficDirections>	INTEGER (0..16,000,000)	When nbr-SeparateTrafficDirections is equal to 2, Requested Guaranteed Bit Rate for downlink is signalled first, then Requested Guaranteed Bit Rate for uplink.
>RAB Configuration Change Request	O		ENUMERATED (Fallback Requested, Upgrade Requested,...)	Indicates a request to perform fallback or RAB upgrade .

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

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,
    maxNrOfSRBs,
    maxNrOfSeparateTrafficDirections,
    maxRAB-Subflows,
    maxRAB-SubflowCombination,
    maxNrOfLevels,
    maxNrOfAltValues,
    maxNrOfSNAs,
    maxNrOfLAs,
    maxNrOfPLMNsSN,
    maxSet,
    maxNrOfUEsToBeTraced,
    maxNrOfInterfaces,

    id-CN-DomainIndicator,
    id-MessageStructure,
    id-SRB-TrCH-Mapping,
    id-TypeOfError,

    id-hS-DSCH-MAC-d-Flow-ID,
    id-SignallingIndication,
    id-CellLoadInformationGroup,
    id-TraceRecordingSessionInformation,
    id-FallbackPossibilityIndication,
    id-UpgradePossibilityIndication,
    id-RABConfigurationChangeRequest
FROM RANAP-Constants

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

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

-- A

AccuracyFulfilmentIndicator ::= ENUMERATED{
    requested-Accuracy-Fulfilled,
    requested-Accuracy-Not-Fulfilled,
    ...
}

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 ::= {
    -- Extension for Release 6 to indicate that fallback possibility is available --
    { ID id-FallbackPossibilityIndication   CRITICALITY ignore EXTENSION
    FallbackPossibilityIndication PRESENCE optional }|
    -- Extension for Release 6 to indicate that upgrade possibility is available --
    { ID id-UpgradePossibilityIndication   CRITICALITY ignore EXTENSION RAB-Parameters PRESENCE
    optional },
    ...
}

Alt-RAB-Parameter-GuaranteedBitrateInf ::= SEQUENCE {
    altGuaranteedBitrateType   Alt-RAB-Parameter-GuaranteedBitrateType,
    altGuaranteedBitrates      Alt-RAB-Parameter-GuaranteedBitrates      OPTIONAL
    -- This IE shall be present if the Type of Guaranteed Bit Rates Information IE is set to "Value
    range" or "Discrete values" --,
    ...
}

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

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

```

Some unaffected parts of 9.3.4

```

Event ::= ENUMERATED {
    stop-change-of-service-area,
    direct,
    change-of-servicearea,
    ...,
    stop-direct
}

-- F
FallbackPossibilityIndication ::= ENUMERATED {
    Fallback,
    ...
}

-- G
GeographicalArea ::= CHOICE {
    point          GA-Point,
    pointWithUnCertainty   GA-PointWithUnCertainty,
    polygon        GA-Polygon,
    ...,
    pointWithUncertaintyEllipse   GA-PointWithUnCertaintyEllipse,
    pointWithAltitude   GA-PointWithAltitude,
    pointWithAltitudeAndUncertaintyEllipsoid   GA-PointWithAltitudeAndUncertaintyEllipsoid,
    ellipsoidArc        GA-EllipsoidArc
}

```

Some unaffected parts of 9.3.4

```

RAB-TrCH-MappingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    -- Extension for Release 99 to enable transfer of RAB Subflow mapping onto Iur transport channel Ids
    for a given indicated domain --
    { ID id-CN-DomainIndicator   CRITICALITY ignore   EXTENSION CN-DomainIndicator   PRESENCE
    optional },
    ...
}

```

```

}
RABConfigurationChangeRequest ::= ENUMERATED {
    fallback-requested,
    upgrade-requested,
    ...
}
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,
    ...,
    realtime
}
RelocationType ::= ENUMERATED {
    ue-not-involved,
    ue-involved,
    ...
}
RepetitionNumber0 ::= INTEGER (0..255)
RepetitionNumber1 ::= INTEGER (1..256)
ReportArea ::= ENUMERATED {
    service-area,
    geographical-area,
    ...
}
RequestedGPSAssistanceData ::= OCTET STRING (SIZE (1 .. 38 ))
    -- gpsAssistanceData as defined in 24.080 --
RequestedLocationRelatedDataType ::= ENUMERATED {
    decipheringKeysUEBasedOTDOA,
    decipheringKeysAssistedGPS,
    dedicatedAssistanceDataUEBasedOTDOA,
    dedicatedAssistanceDataAssistedGPS,
    ...
}
Requested-RAB-Parameter-Values ::= SEQUENCE {
    requestedMaxBitrates          Requested-RAB-Parameter-MaxBitrateList          OPTIONAL,
    requestedGuaranteedBitrates   Requested-RAB-Parameter-GuaranteedBitrateList
    OPTIONAL,
    iE-Extensions                 ProtocolExtensionContainer { { Requested-RAB-Parameter-Values-ExtIEs } }
    OPTIONAL,
    ...
}
Requested-RAB-Parameter-Values-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    -- Extension for Release 6 to enable RNC to request fallback --
    { ID id-RABConfigurationChangeRequest CRITICALITY ignore EXTENSION
    RABConfigurationChangeRequest PRESENCE optional },
    ...
}

```



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

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

Some unaffected parts of 9.3.4

```
TypeOfError ::= ENUMERATED {
  not-understood,
  missing,
  ...
}
```

```
-- U
```

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

```
UESBI-Iu ::= SEQUENCE {
  uESBI-IuA       UESBI-IuA   OPTIONAL,
  uESBI-IuB       UESBI-IuB   OPTIONAL,
  iE-Extensions   ProtocolExtensionContainer { {UESBI-Iu-ExtIEs} } OPTIONAL,
  ...
}
```

```
UESBI-Iu-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
```

```
UESBI-IuA          ::= BIT STRING (SIZE(1..128))
-- Reference: TR25.994 --
UESBI-IuB          ::= BIT STRING (SIZE(1..128))
-- Reference: TR25.995 --
```

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

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

```
UP-ModeVersions           ::= BIT STRING (SIZE (16))
```

```
USCH-ID                   ::= INTEGER (0..255)
```

```
UserPlaneMode ::= ENUMERATED {
  transparent-mode,
  support-mode-for-predefined-SDU-sizes,
  ...
}
```

```
-- V
```

```
VerticalAccuracyCode      ::= INTEGER (0..127)
```

```
END
```

9.3.6 Constant Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

id-RAB-Assignment                INTEGER ::= 0
id-Iu-Release                    INTEGER ::= 1
id-RelocationPreparation        INTEGER ::= 2
id-RelocationResourceAllocation INTEGER ::= 3
id-RelocationCancel             INTEGER ::= 4
id-SRNS-ContextTransfer         INTEGER ::= 5
id-SecurityModeControl          INTEGER ::= 6
id-DataVolumeReport             INTEGER ::= 7
id-Reset                         INTEGER ::= 9
id-RAB-ReleaseRequest           INTEGER ::= 10
id-Iu-ReleaseRequest            INTEGER ::= 11
id-RelocationDetect             INTEGER ::= 12
id-RelocationComplete           INTEGER ::= 13
id-Paging                       INTEGER ::= 14
id-CommonID                     INTEGER ::= 15
id-CN-InvokeTrace               INTEGER ::= 16
id-LocationReportingControl     INTEGER ::= 17
id-LocationReport               INTEGER ::= 18
id-InitialUE-Message            INTEGER ::= 19
id-DirectTransfer                INTEGER ::= 20
id-OverloadControl              INTEGER ::= 21
id-ErrorIndication              INTEGER ::= 22
id-SRNS-DataForward             INTEGER ::= 23
id-ForwardSRNS-Context          INTEGER ::= 24
id-privateMessage                INTEGER ::= 25
id-CN-DeactivateTrace           INTEGER ::= 26
id-ResetResource                INTEGER ::= 27
id-RANAP-Relocation             INTEGER ::= 28
id-RAB-ModifyRequest            INTEGER ::= 29
id-LocationRelatedData          INTEGER ::= 30
id-InformationTransfer           INTEGER ::= 31
id-UESpecificInformation         INTEGER ::= 32
id-UplinkInformationTransfer     INTEGER ::= 33
id-DirectInformationTransfer     INTEGER ::= 34

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

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

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

maxNrOfDTs                       INTEGER ::= 15
maxNrOfErrors                     INTEGER ::= 256
maxNrOfIuSigConIds               INTEGER ::= 250

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maxNrOfPDPDirections          INTEGER ::= 2
maxNrOfPoints                 INTEGER ::= 15
maxNrOfRABs                   INTEGER ::= 256
maxNrOfSeparateTrafficDirections INTEGER ::= 2
maxNrOfSRBs                   INTEGER ::= 8
maxNrOfVol                     INTEGER ::= 2
maxNrOfLevels                 INTEGER ::= 256
maxNrOfAltValues              INTEGER ::= 16
maxNrOfPLMNsSN                INTEGER ::= 32
maxNrOfLAs                    INTEGER ::= 65536
maxNrOfSNAs                    INTEGER ::= 65536
maxNrOfUEsToBeTraced          INTEGER ::= 64
maxNrOfInterfaces             INTEGER ::= 16

maxRAB-Subflows               INTEGER ::= 7
maxRAB-SubflowCombination      INTEGER ::= 64
maxSet                         INTEGER ::= 9

-- *****
--
-- 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

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id-RelocationType	INTEGER ::= 56
id-RequestType	INTEGER ::= 57
id-SAI	INTEGER ::= 58
id-SAPI	INTEGER ::= 59
id-SourceID	INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer	INTEGER ::= 61
id-TargetID	INTEGER ::= 62
id-TargetRNC-ToSourceRNC-TransparentContainer	INTEGER ::= 63
id-TemporaryUE-ID	INTEGER ::= 64
id-TraceReference	INTEGER ::= 65
id-TraceType	INTEGER ::= 66
id-TransportLayerAddress	INTEGER ::= 67
id-TriggerID	INTEGER ::= 68
id-UE-ID	INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber	INTEGER ::= 70
id-RAB-FailedtoReportItem	INTEGER ::= 71
id-RAB-FailedtoReportList	INTEGER ::= 72
id-KeyStatus	INTEGER ::= 75
id-DRX-CycleLengthCoefficient	INTEGER ::= 76
id-IuSigConIdList	INTEGER ::= 77
id-IuSigConIdItem	INTEGER ::= 78
id-IuSigConId	INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf	INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf	INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf	INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf	INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem	INTEGER ::= 84
id-RAB-ContextFailedtoTransferList	INTEGER ::= 85
id-GlobalRNC-ID	INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp	INTEGER ::= 87
id-MessageStructure	INTEGER ::= 88
id-Alt-RAB-Parameters	INTEGER ::= 89
id-Ass-RAB-Parameters	INTEGER ::= 90
id-RAB-ModifyList	INTEGER ::= 91
id-RAB-ModifyItem	INTEGER ::= 92
id-TypeOfError	INTEGER ::= 93
id-BroadcastAssistanceDataDecipheringKeys	INTEGER ::= 94
id-LocationRelatedDataRequestType	INTEGER ::= 95
id-GlobalCN-ID	INTEGER ::= 96
id-LastKnownServiceArea	INTEGER ::= 97
id-SRB-TrCH-Mapping	INTEGER ::= 98
id-InterSystemInformation-TransparentContainer	INTEGER ::= 99
id-NewBSS-To-OldBSS-Information	INTEGER ::= 100
id-SourceRNC-PDCP-context-info	INTEGER ::= 103
id-InformationTransferID	INTEGER ::= 104
id-SNA-Access-Information	INTEGER ::= 105
id-ProvidedData	INTEGER ::= 106
id-GERAN-BSC-Container	INTEGER ::= 107
id-GERAN-Classmark	INTEGER ::= 108
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item	INTEGER ::= 109
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse	INTEGER ::= 110
id-VerticalAccuracyCode	INTEGER ::= 111
id-ResponseTime	INTEGER ::= 112
id-PositioningPriority	INTEGER ::= 113
id-ClientType	INTEGER ::= 114
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode	INTEGER ::= 115
id-SignallingIndication	INTEGER ::= 116
id-hS-DSCH-MAC-d-Flow-ID	INTEGER ::= 117
id-UESBI-Iu	INTEGER ::= 118
id-PositionData	INTEGER ::= 119
id-PositionDataSpecificToGERANIuMode	INTEGER ::= 120
id-CellLoadInformationGroup	INTEGER ::= 121
id-AccuracyFulfilmentIndicator	INTEGER ::= 122
id-InformationTransferType	INTEGER ::= 123
id-TraceRecordingSessionInformation	INTEGER ::= 124
id-TracePropagationParameters	INTEGER ::= 125
id-InterSystemInformationTransferType	INTEGER ::= 126
id-FallbackPossibilityIndication	INTEGER ::= 127
id-UpgradePossibilityIndication	INTEGER ::= 128
id-RABConfigurationChangeRequest	INTEGER ::= 129

END

