TSG RAN Meeting #26   **RP-040439**
Vouliagmeni Athens, Greece, 08 - 10 December 2004

Title   CRs (Rel-6 Category B) for the introduction of "enhancement of the
                          support of network sharing" in RAN3 specifications
Source   TSG RAN WG3
Agenda Item   8.6

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	CR	Rev	Cat	Rel	Title	Work item
R3-041419	25.413	6.3.0	6.4.0	701		B	Rel-6	Indication of selected PLMN in shared networks	NTShar-UTRANEnh
R3-041478	25.410	6.1.0	6.2.0	58		B	Rel-6	MOCN rerouting function	NTShar-UTRANEnh
R3-041479	25.401	6.4.0	6.5.0	92		B	Rel-6	Support of MOCN and GWCN configurations in UTRAN	NTShar-UTRANEnh
R3-041621	25.413	6.3.0	6.4.0	702	1	B	Rel-6	Rerouting in MOCN	NTShar-UTRANEnh
R3-041711	25.413	6.3.0	6.4.0	715	2	B	Rel-6	Support of full Mobility/Backwards Compatibility in Network Sharing	NTShar-UTRANEnh

CR-Form-v7.1

CHANGE REQUEST

| ⌘ | **25.401** CR **92** | ⌘**rev** | **-** | ⌘ | Current version: | **6.4.0** | ⌘ |

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

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

Title: ⌘	Support of MOCN and GWCN configurations in UTRAN	
Source: ⌘	RAN3	
Work item code:⌘	NTShar-UTRANEnh	***Date:*** ⌘ 10/11/2004

Category: ⌘ **B**		***Release:*** ⌘ Rel-6
	Use one of the following categories: ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* *Ph2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *Rel-4 (Release 4)* *Rel-5 (Release 5)* *Rel-6 (Release 6)* *Rel-7 (Release 7)*

Reason for change: ⌘	Introduction of MOCN and GWCN configurations support
Summary of change:⌘	Since the description of the MOCN and GWCN configurations function and proper references are missing in the 25.401, this CR introduces the proper descriptions and reference in this spec.
Consequences if ⌘ ***not approved:***	

Clauses affected: ⌘	2, 3.1, 3.2, 7.1, 7.2.1.x (new section)

		Y	N		
Other specs ⌘		X		Other core specifications ⌘	25.413, 25.410
affected:			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘	

How to create CRs using this form:

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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 25.990: "Vocabulary".

[2]   3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

[3]   3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[4]   3GPP TS 25.442: "UTRAN Implementation Specific O&M Transport".

[5]   3GPP TS 25.402: "Synchronisation in UTRAN, Stage 2".

[6]   3GPP TS 23.003: "Numbering, Addressing and Identification".

[7]   3GPP TS 25.331: "RRC Protocol Specification".

[8]   3GPP TS 23.101: "General UMTS Architecture".

[9]   3GPP TS 25.414: " UTRAN Iu Interface Data Transport & Transport Signalling".

[10]   3GPP TS 25.424: "UTRAN Iur Interface Data Transport & Transport Signalling for Common Transport Channel Data Streams".

[11]   3GPP TS 25.434: "UTRAN Iub Interface Data Transport & Transport Signalling for Common Transport Channel Data Streams".

[12]   IETF RFC 2460: "Internet Protocol, Version 6 (Ipv6) Specification".

[13]   IETF RFC 2474: "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers " December 1998

[14]   IETF RFC 768: "User Datagram Protocol", (8/1980)

[15]   "Information technology – Open Systems Interconnection – Network service definition", X.213, ISO/IEC 8348.

[16]   "Information technology – Open Systems Interconnection – Network service definition Amendment 1: Addition of the Internet protocol address format identifier", X.213/Amd.1, ISO/IEC 8348.

[17]   IETF RFC 791 (1981): "Internet Protocol".

[18]   3GPP TS 25.426: "UTRAN Iur and Iub Interface Data Transport & Transport Signalling for DCH Data Streams".

[19]   Void

[20]   3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".

[21]   3GPP TR 43.930: "Iur-g interface; Stage 2".

[22]   3GPP TR 44.901: "External Network Assisted Cell Change".

[23]   3GPP TS 48.018: "General Packet Radio Service (GPRS); BSS GPRS Protocol (BSSGP)".

[24]   3GPP TS 25.460: "UTRAN Iuant Interface: General Aspects and Principles".

[25]   3GPP TS 25.461: "UTRAN Iuant Interface: Layer 1".

[26]   3GPP TS 25.462: "UTRAN Iuant Interface: Signalling Transport".

[27]   3GPP TS 25.463: "UTRAN Iuant Interface: Remote Electrical Tilting (RET) Antennas Application Part (RETAP) Signalling".

[r1]   3GPP TS 23.251: "Network sharing - Architecture and functional description".

[r2]   3GPP TS 25.410: "UTRAN Iu Interface: general aspects and principles".

3   Definitions and abbreviations

3.1   Definitions

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

ALCAP: generic name for the transport signalling protocols used to set-up and tear-down transport bearers

Cell: Radio Network object that can be uniquely identified by a User Equipment from a (cell) identification that is broadcasted over a geographical area from one *UTRAN Access Point*
A Cell is either FDD or TDD mode.

Iu: interface between an RNC and an MSC, SGSN or CBC, providing an interconnection point between the RNS and the Core Network. It is also considered as a reference point

Iub: interface between the RNC and the Node B

Iur: logical interface between two RNCs
Whilst logically representing a point to point link between RNCs, the physical realisation need not be a point to point link.

Iur-g: logical interface between RNC/BSS and BSS
Whilst logically representing a point to point link between RNC/BSS and BSS, the physical realisation need not be a point to point link.

Logical Model: Logical Model defines an abstract view of a network or network element by means of information objects representing network element, aggregations of network elements, the topological relationship between the elements, endpoints of connections (termination points), and transport entities (such as connections) that transport information between two or more termination points

The information objects defined in the Logical Model are used, among others, by connection management functions. In this way, a physical implementation independent management is achieved.

Network sharing supporting UE: as defined in [r1].

Network sharing non-supporting UE: as defined in [r1].

Node B: logical node in the RNS responsible for radio transmission / reception in one or more cells to/from the UE
The logical node terminates the Iub interface towards the RNC.

Radio Resources: resources that constitute the radio interface in UTRAN, e.g. frequencies, scrambling codes, spreading factors, power for common and dedicated channels

Node B Application Part: Radio Network Signalling over the Iub

Radio Network Controller: logical node in the RNS in charge of controlling the use and the integrity of the radio resources

Controlling RNC: role an RNC can take with respect to a specific set of Node B's
There is only one Controlling RNC for any Node B. The Controlling RNC has the overall control of the logical resources of its node B's.

Radio Network Subsystem: RNS can be either a full UTRAN or only a part of a UTRAN
An RNS offers the allocation and release of specific radio resources to establish means of connection in between an UE and the UTRAN. A Radio Network Subsystem contains one RNC and is responsible for the resources and transmission/reception in a set of cells.

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

Drift RNS: role an RNS can take with respect to a specific connection between an UE and UTRAN
An RNS that supports the Serving RNS with radio resources when the connection between the UTRAN and the UE need to use cell(s) controlled by this RNS is referred to as Drift RNS.

Radio Access Network Application Part: Radio Network Signalling over the Iu

Radio Network Subsystem Application Part: Radio Network Signalling over the Iur

RRC Connection: point-to-point bi-directional connection between RRC peer entities on the UE and the UTRAN sides, respectively
An UE has either zero or one RRC connection.

Stand-Alone SMLC: logical node that interconnects to the RNC over the Iupc interface via the PCAP protocol
This node provides GPS related data to the RNC and may perform the position calculation function.

User Equipment: Mobile Equipment with one or several UMTS Subscriber Identity Module(s)
A device allowing a user access to network services via the Uu interface. The UE is defined in ref. [8]. If this term is used in the context of Iur-g, it means MS in case it uses radio resources of a DBSS.

Universal Terrestrial Radio Access Network: UTRAN is a conceptual term identifying that part of the network which consists of RNCs and Node Bs between Iu an Uu
The concept of UTRAN instantiation is currently undefined.

UTRAN Access Point: conceptual point within the UTRAN performing radio transmission and reception
A UTRAN access point is associated with one specific *cell*, i.e. there exists one UTRAN access point for each cell. It is the UTRAN-side end point of a *radio link*.

Radio Link: "radio link" is a logical association between a single User Equipment and a single UTRAN access point
Its physical realisation comprises one or more radio bearer transmissions.

Radio Link Set: set of one or more Radio Links that has a common generation of Transmit Power Control (TPC) commands in the DL

Uu: Radio interface between UTRAN and the User Equipment

RAB sub-flows: Radio Access Bearer can be realised by UTRAN through several sub-flows
These sub-flows correspond to the NAS service data streams that have QoS characteristics that differ in a predefined manner within a RAB e.g. different reliability classes.

RAB sub-flows have the following characteristics:

1) The sub-flows of a RAB are established and released at the RAB establishment and release, respectively.

2) The sub-flows of a RAB are submitted and delivered together at the RAB SAP.

3) The sub-flows of a RAB are carried over the same Iu transport bearer.

4) The sub-flows of a RAB are organised in a predefined manner at the SAP and over the Iu interface. The organisation is imposed by the NAS as part of its co-ordination responsibility.

Set of co-ordinated DCHs: set of co-ordinated DCHs is a set of dedicated transport channels that are always established and released in combination
Individual DCHs within a set of co-ordinated DCHs cannot be operated on individually e.g. if the establishment of one DCH fails, the establishment of all other DCHs in the set of co-ordinated DCHs shall be terminated unsuccessfully. A set of coordinated DCHs is transferred over one transport bearer. All DCHs in a set of co-ordinated DCHs shall have the same TTI.

Shared Network Area (SNA): Area consisting ofr one or more LA's to which access can be controlled.

******************** NEXT MODIFIED SECTION*****************

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAL	ATM Adaptation Layer
AAL2	ATM Adaptation Layer 2
ALCAP	Access Link Control Application Part
ATM	Asynchronous Transfer Mode
BM-IWF	Broadcast Multicast Interworking Function
BMC	Broadcast/Multicast Control
BSS	Base Station Subsystem
CBC	Cell Broadcast Centre
CBS	Cell Broadcast Service
CN	Core Network
CPCH	Common Packet Channel
CRNC	Controlling Radio Network Controller
DCH	Dedicated Channel
DL	Downlink
DRNS	Drift RNS
EDGE	Enhanced Data rates for Global Evolution
FACH	Forward Access Channel
FFS	For Further Study
GERAN	GSM EDGE Radio Access Network
GSM	Global System for Mobile Communications
GTP	GPRS Tunnelling Protocol
GWCN	GateWay Core Network
IPv4	Internet Protocol, version 4
IPv6	Internet Protocol, version 6
LA	Location Area
MAC	Medium Access Control
MOCN	Multi Operator Core Network
NACC	Network Assisted Cell Change
NAS	Non Access Stratum
NBAP	Node B Application Part
NNSF	NAS Node Selection Fuction
NSAP	Network Service Access Point
PCH	Paging Channel
PLMN	Public Land Mobile Network
QoS	Quality of Service
RAB	Radio Access Bearer
RACH	Random Access Channel
RANAP	Radio Access Network Application Part

RET	Remote Electrical Tilting
RIM	RAN Information Management
RNC	Radio Network Controller
RNL	Radio Network Layer
RNS	Radio Network Subsystem
RNSAP	Radio Network Subsystem Application Part
RNTI	Radio Network Temporary Identity
SAB	Service Area Broadcast
SAS	Stand-Alone SMLC
SMLC	Serving Mobile Location Centre
SNA	Shared Network Area
SRNC	Serving Radio Network Controller
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TNL	Transport Network Layer
TTI	Transmission Time Interval
UDP	User Datagram Protocol
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunication System
URA	UTRAN Registration Area
USIM	UMTS Subscriber Identity Module
UTRAN	Universal Terrestrial Radio Access Network

********************* **NEXT MODIFIED SECTION**********************

7   UTRAN Functions description

7.1   List of functions

- Transfer of User Data.

- Functions related to overall system access control:

    - Admission Control;

    - Congestion Control;

    - System information broadcasting.

- Radio channel ciphering and deciphering.

- Integrity protection.

- Functions related to mobility:

    - Handover;

    - SRNS Relocation;

    - Paging support;

    - Positioning;

    - GERAN System Information Retrieval.

- Functions related to radio resource management and control:

- Radio resource configuration and operation;

- Radio environment survey;

- Combining/splitting control;

- Connection set-up and release;

- Allocation and deallocation of Radio Bearers;

- [TDD - Dynamic Channel Allocation (DCA)];

- Radio protocols function;

- RF power control;

- [3.84 Mcps TDD - Timing Advance];

- [1.28 Mcps TDD – Uplink Synchronisation];

- Radio channel coding;

- Radio channel decoding;

- Channel coding control;

- Initial (random) access detection and handling;

- CN Distribution function for Non Access Stratum messages.

- Synchronisation.

- Functions related to broadcast and multicast services (see note) (broadcast/multicast interworking function BM-IWF).

NOTE: Only Broadcast is applicable for Release 99.

- Broadcast/Multicast Information Distribution.

- Broadcast/Multicast Flow Control.

- CBS Status Reporting.

- Tracing.

- Volume reporting.

- NAS Node Selection.

- RAN Information Management.

- MOCN and GWCN configuration support.

7.2   Functions description

7.2.0   Transfer of user data

This function provides user data transfer capability across the UTRAN between the Iu and Uu reference points.

7.2.1   Functions related to overall system access control

System access is the means by which a UMTS user is connected to the UTRAN in order to use UMTS services and/or facilities. User system access may be initiated from either the mobile side, e.g. a mobile originated call, or the network side, e.g. a mobile terminated call.

7.2.1.1 Admission Control

The purpose of the admission control is to admit or deny new users, new radio access bearers or new radio links (for example due to handover). The admission control should try to avoid overload situations and base its decisions on interference and resource measurements. The admission control is employed at for example initial UE access, RAB assignment/reconfiguration and at handover. These cases may give different answers depending on priority and situation.

The Admission Control function based on UL interference and DL power is located in the Controlling RNC.

The Serving RNC is performing admission Control towards the Iu interface.

7.2.1.2 Congestion Control

The task of congestion control is to monitor, detect and handle situations when the system is reaching a near overload or an overload situation with the already connected users. This means that some part of the network has run out, or will soon run out of resources. The congestion control should then bring the system back to a stable state as seamless as possible.

NOTE: This admission Control function is related to Radio Resources.

Congestion control is performed within UTRAN.

7.2.1.3 System information broadcasting

This function provides the mobile station with the Access Stratum and Non Access Stratum information which are needed by the UE for its operation within the network.

The basic control and synchronisation of this function is located in UTRAN.

7.2.1.x MOCN and GWCN configuration support

In the MOCN configuration only the radio access part of the network is shared. For the MOCN configuration it is required that the rerouting function, as described in [r2], is supported.

In the GWCN configuration, besides shared radio access network, the core network operators also share part of the core network, at least MSC and/or SGSN.

For both the GWCN and MOCN configurations, the RNC carries the selected PLMN-id between network sharing supporting UEs and the corresponding CN.

The network sharing MOCN and GWCN configurations are described in detail in [r1].

7.2.2 Radio channel ciphering and deciphering

This function is a pure computation function whereby the radio transmitted data can be protected against a non-authorised third-party. Ciphering and deciphering may be based on the usage of a session-dependent key, derived through signalling and/or session dependent information.

This function is located in the UE and in the UTRAN.

******************** END OF MODIFICATIONS *****************

CR-Form-v7.1

CHANGE REQUEST

⌘   **25.410** CR **58**   ⌘**rev** **-** ⌘ Current version: **6.1.0** ⌘

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

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

Title: ⌘	MOCN rerouting function	
Source: ⌘	RAN3	
Work item code: ⌘	NTShar-UTRANEnh	***Date:*** ⌘ 10/11/2004
Category: ⌘ **B**		***Release:*** ⌘ Rel-6

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

Use *one* of the following releases:
Ph2   (GSM Phase 2)
R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change: ⌘	Introduction of rerouting for MOCN.
Summary of change: ⌘	Since the description of the rerouting function and proper references are missing in the 25.410, this CR introduces the redirect function in MOCN configuration and proper reference in this spec
Consequences if not approved: ⌘	

Clauses affected: ⌘	2, 3.2, 4.1.1, 4.1.2, 4.1.x (new section), 4.3, 5.1, 5.9.x (new section)

	Y	**N**		
Other specs affected: ⌘	X		Other core specifications ⌘	25.413, 25.401
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

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*********************FIRST MODIFIED SECTION******************

2 References

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[1]	3GPP TS 25.401: "UTRAN Overall Description".
[2]	3GPP TR 23.930: "Iu Principles".
[3]	3GPP TS 23.110: "UMTS Access Stratum Services and Functions".
[4]	3GPP TS 25.411: "UTRAN Iu Interface Layer 1".
[5]	3GPP TS 25.412: "UTRAN Iu Interface Signalling Transport".
[6]	3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling".
[7]	3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling"
[8]	3GPP TS 25.415: "UTRAN Iu Interface User Plane Protocols".
[9]	ITU-T Recommendation Q.711 (07/1996): "Functional description of the signalling connection control part".
[10]	ITU-T Recommendation Q.712 (07/1996): "Definition and function of signalling connection control part messages".
[11]	ITU-T Recommendation Q.713 (07/1996): "Signalling connection control part formats and codes".
[12]	ITU-T Recommendation Q.714 (07/1996): "Signalling connection control part procedures".
[13]	3GPP TS 23.003: "Numbering, Addressing and Identification".
[14]	3GPP TS 25.419: "UTRAN Iu Interface: Service Area Broadcast Protocol SABP".
[15]	3GPP TS 23.153: "Out of Band Transcoder Control; Stage 2".
[16]	ITU-T Recommendation Q.2630.1: "AAL type 2 signalling protocol - (Capability Set 1)".
[17]	ITU-T Recommendation Q.2630.2: "AAL type 2 signalling protocol - Capability Set 2".

[18]   INTERNET-DRAFT, G. Sidebottom et al, "SS7 MTP3-User Adaptation Layer (M3UA)", draft-ietf-sigtran-m3ua-12.txt, February 2002.

[19]   IETF RFC 1889(01/1996): "RTP: A Transport Protocol for Real Time Applications".

[20]   IETF RFC 768 (08/1980): "User Datagram Protocol".

[21]   IETF RFC 793 (09/1981): "TCP, Transmission Control Protocol".

[22]   IETF RFC 791 (09/1981): "Internet Protocol".

[23]   IETF RFC 2460 (12/1998): "Internet Protocol, Version 6 (IPv6) Specification".

[24]   IETF RFC 2960 (10/2000): "Stream Control Transmission Protocol".

[25]   3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".

[xx]   3GPP TS 23.251: "Network sharing - Architecture and functional description".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G-MSC	3rd Generation Mobile Switching Centre
3G-SGSN	3rd Generation Serving GPRS Support Node
AAL	ATM Adaptation Layer
ATM	Asynchronous Transfer Mode
BC	Broadcast
BSSMAP	Base Station Subsystem Management Application Part
CBS	Cell Broadcast Service
CC	Connection Confirm
CN	Core Network
CR	Connection Release
CREF	Connection Refusal
CS	Circuit Switched
GT	Global Title
GTP-U	GPRS Tunnelling Protocol
GWCN	Gateway Core Network
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LA	Location Area
M3UA	MTP3 User Adaptation Layer
MOCN	Multi Operator Core Network
NAS	Non Access Stratum
NACC	Network Assisted Cell Change
NNSF	NAS Node Selection Function
O&M	Operation and Maintenance
PLMN	Public Land Mobile Network
PS	Packet Switched
PSTN	Public Switched Telephone Network
PVC	Permanent Virtual Circuit
QoS	Quality of Service

RA	Routing Area
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RIM	RAN Information Management
RLP	Radio Link Protocol
RNC	Radio Network Controller
RNL	Radio Network Layer
RRC	Radio Resource Control
RTCP	Real Time Control Protocol
RTP	Real Time Protocol
SA	Service Area
SABP	Service Area Broadcast Protocol
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SCTP	Stream Control Transmission Protocol
SNA	Shared Network Area
SPC	Signalling Point Code
SRNS	Serving Radio Network Subsystem
SSN	Sub-System Number
SVC	Switched Virtual Circuit
TCP	Transmission Control Protocol
UE	User Equipment
UDP	User Datagram Protocol
UP	User Plane
URA	UTRAN Registration Area
UTRAN	UMTS Terrestrial Radio Access Network
VC	Virtual Circuit

******************** NEXT MODIFIED SECTION*****************

4 General Aspects

4.1 UTRAN Architecture

4.1.1 Iu Interface Architecture

The overall UMTS architecture and UTRAN architectures are described in [1]. This subclause specifies only the architecture of the Iu interface, and shall not constrain the network architecture of either Core or Radio Access Networks.

The I_u interface is specified at the boundary between the Core Network and UTRAN. Figure 4.1 depicts the logical division of the I_u interface. From the Iu perspective, the UTRAN access point is an RNC.
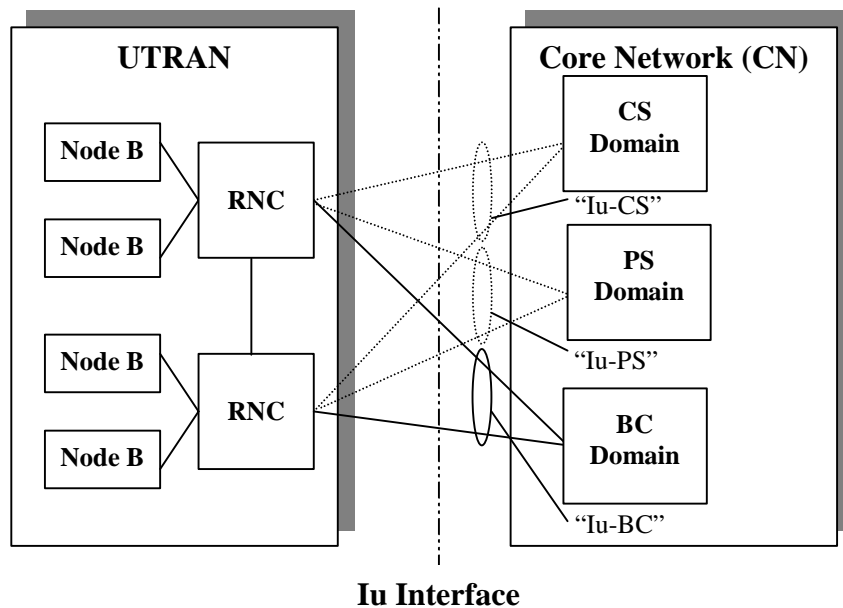
Iu Interface

Figure 4.1: I$_u$ Interface Architecture

The Iu interface towards the PS-domain of the core network is called Iu-PS, and the Iu interface towards the CS-domain is called Iu-CS. The differences between Iu-CS and Iu-PS are treated elsewhere in the present document. The Iu interface to the Broadcast domain is called Iu-BC.

There shall not be more than one Iu interface (Iu-PS) towards the PS-domain from any one RNC– except where the NNSF is used, see subclause 4.1.3, or in MOCN configuration – see [xx]. Each RNC shall not have more than one Iu interface (Iu-CS) towards its default CN node within the CS domain, but may also have further Iu interfaces (Iu-CS) towards other CN nodes within the CS domain. (See [6] for definition of Default CN node.) These further Iu interfaces (Iu-CS) shall only be used as a result of intra-MSC inter-system handover or SRNS relocation, in the case the anchor CN node directly connects to the target RNC. There may also be more than one Iu interface towards the CS-Domain if the NNSF is used – see subclause 4.1.3 – or in MOCN configuration – see [xx]. There shall not be more than one Iu interface (Iu-BC) from an RNC towards the Broadcast domain.

In the separated core network architecture, this means that there shall be separate signalling and user data connections towards the PS and CS domains – this applies in both transport and radio network layers.

In the combined architecture, there shall be separate connections in the user plane towards the PS and CS domains (in both transport and radio network layers). In the control plane, there shall be separate SCCP connections to the two logical domains.

In either architecture, there can be several RNCs within UTRAN and so UTRAN may have several I$_u$ access points towards the Core Network. As a minimum, each Iu access point (in UTRAN or CN) shall independently fulfil the requirements of the relevant Iu specifications (25.41x series – see clause 7).

******************** NEXT MODIFIED SECTION*****************

4.1.2   I$_u$ connection principles

The Iu interface has a hierarchical architecture where one higher layer entity controls several lower layer entities. The hierarchy for the CN - UTRAN signalling connection end points is described below:

-    Each CN Access Point may be connected to one or more UTRAN Access Points.

- For the PS domain, each UTRAN Access Point shall not be connected to more than one CN Access Point – except where the NNSF is used, see subclause 4.1.3, or when RNC is shared in MOCN configuration.

- For the CS domain, each UTRAN Access Point may be connected to one or more CN Access Points.

- For the BC domain, each UTRAN Access Point may be connected to one CN Access Point only.

4.1.3 Implementation of the NAS Node Selection Function

The optional NAS Node Selection Function (NNSF) is described in [x1].

If the NAS Node Selection Function is used by an RNC:

- There may be more than one Iu interface (Iu-CS) towards the CS domain and/or more than one Iu interface (Iu-PS) towards the PS-domain from this RNC.

4.1.x Implementation of MOCN configuration support

The MOCN configuration is described in [xx]. When the RNC is shared in MOCN configuration:

- There may be more than one Iu interface (Iu-CS) towards the CS domain of different CN operators and/or more than one Iu interface (Iu-PS) towards the PS-domain of different CN operators from this RNC.

- The MOCN Rerouting Function shall be supported.

********************* NEXT MODIFIED SECTION*****************

4.3 I$_u$ Interface Specification Objectives

The following objectives are partly derived from [2].

The I$_u$ interface shall be specified such that it can support:

- the interconnection of RNCs with Core Network Access Points within a single PLMN, and within several PLMNs in case of network sharing, as described in [xx].

- the interconnection of RNCs with Core Network Access Points irrespective of the manufacturer of any of the elements.

- all UMTS services.

The I$_u$ interface shall facilitate the use of the same RNC, MSC or SGSN in all PLMNs.

The I$_u$ interface shall facilitate the sharing of transport technology between Iu-PS and Iu-BC.

The I$_u$ interface shall allow interworking to the GSM Core Network.

Independence between the protocol layers and between control and user planes shall be maintained on the Iu interface.

The I$_u$ interface shall allow independent evolution of technologies within the Core, Radio Access and Transport Networks.

The I$_u$ interface shall allow separate evolution of O&M facilities.

The I$_u$ interface shall be standardised as an open and multi-vendor interface.

The Iu interface specifications shall facilitate the migration of some services from the CS-domain to the PS-domain. In particular, the RANAP protocol shall be common to both PS and CS domains, and the I$_u$ user plane protocol(s) shall be independent of the core network domain (PS or CS), except where a specific feature is only required for one domain.

5 Functions of the I$_u$ Interface Protocols & Functional Split

5.1 General

This subclause defines the functional split between the core network and the UMTS radio access network. In addition, the possible interaction between the functions is defined. The functional split is shown in table 5.1.

Table 5.1: Iu interface functional split

Function	UTRAN	CN
RAB management functions:		
RAB establishment, modification and release	X	X
RAB characteristics mapping I_u transmission bearers	X	
RAB characteristics mapping Uu bearers	X	
RAB queuing, pre-emption and priority	X	X
Radio Resource Management functions:		
Radio Resource admission control	X	
Broadcast Information	X	X
I_u link Management functions:		
I_u signalling link management	X	X
ATM VC management	X	X
AAL2 establish and release	X	X
AAL5 management	X	X
GTP-U Tunnels management	X	X
TCP Management	X	X
Buffer Management	X	
I_u U-plane (RNL) Management:		
I_u U-plane frame protocol management		X
I_u U-plane frame protocol initialization	X	
Mobility management functions:		
Location information reporting	X	X
Handover and Relocation		
Inter RNC hard HO, Iur not used or not available	X	X
Serving RNS Relocation (intra/inter MSC)	X	X
Inter system hard HO (UMTS-GSM)	X	X
Inter system Change (UMTS-GSM)	X	X
Paging Triggering		X
GERAN System Information Retrieval	X	X
Security Functions:		
Data confidentiality		
Radio interface ciphering	X	
Ciphering key management		X
User identity confidentiality	X	X
Data integrity		
Integrity checking	X	
Integrity key management		X
Service and Network Access functions:		
CN Signalling data	X	X
Data Volume Reporting	X	
UE Tracing	X	X
Location reporting	X	X
I_u Co-ordination functions:		
Paging co-ordination	X	X
NAS Node Selection Function	X	
MOCN Rerouting Function	X	X

5.9 Co-ordination Functions

5.9.1 Paging Co-ordination function

The two CN domain architecture implies need for a page co-ordination, i.e. handling of page triggered by one CN node when UE has a signalling connection to the other CN node. The paging co-ordination is performed by UTRAN and/or optionally by CN. The Common ID is used for UTRAN paging co-ordination. The CN provides the UTRAN with the Common ID.

The paging co-ordination is a UTRAN function. Optionally the paging co-ordination may be performed in the CN.

5.9.2 NAS Node Selection Function

The optional NAS Node Selection Function enables the RNC to initially assign CN resources to serve a UE and subsequently setup a signalling connection to the assigned CN resource.

The method by which the RNC initially assigns CN resources is implementation dependent.

The NNSF is described in detail in [25].

5.9.3 Information Transfer Function

The Information Transfer function allows configuration data to be passed from the CN to the RNC upon CN trigger. This function is operated in acknowledged mode. It should be used by the CN to maintain alignment between the data as configured in the CN and the configuration data provided to the UTRAN. This may be used e.g. to coordinate the SNA geographical definition (LA to SNA mapping) between CN and UTRAN in order to apply access control on an SNA basis.

5.9.x MOCN Rerouting Function

Rerouting is a mechanism used as part of the assignment of CN operator in shared networks with MOCN configuration for network sharing non-supporting UEs when they perform initial attach /registration. In this case RNC may not know towards which CN to route the initial UE request message and the latter may be rerouted to another CN via RNC.

The MOCN Rerouting Function is described in detail in [xx].

CR-Form-v7.1

CHANGE REQUEST

| ⌘ | **25.413** CR **701** | ⌘ **rev** | **-** | ⌘ | 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 **X**   Core Network **X**

Title: ⌘	Indication of selected PLMN in shared networks	
Source: ⌘	RAN3	
Work item code: ⌘	NTShar-UTRANEnh	***Date:*** ⌘ 03/11/2004

Category: ⌘ **B**		***Release:*** ⌘ Rel-6
	Use one of the following categories: ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* *Ph2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *Rel-4 (Release 4)* *Rel-5 (Release 5)* *Rel-6 (Release 6)* *Rel-7 (Release 7)*

Reason for change: ⌘	A network sharing supporting UE will be able to indicate its selected core network operator to the network. This information needs to be transferred over RANAP to CN.
Summary of change: ⌘	A network sharing supporting UE will be able to read and decode the broadcast multiple PLMN information (i.e. core network operators behind the shared RAN). The UE shall indicate the selected CN operator to RNC in Initial Direct Transfer message. This information shall be conveyed from the RNC to CN. The proposal introduces a new IE in Initial UE Message. The new IE carries information about the selected PLMN (CN-Operator). This IE is used only for network sharing purpose when received from a network sharing supporting UE.
Consequences if not approved: ⌘	

Clauses affected: ⌘	2, 3.1, 8.22.2, 9.1.33, 9.2.3.x1, 9.3.3, 9.3.6

	Y	N		
Other specs ⌘	Y		Other core specifications ⌘	25.331, 25.304, 24.008, 23.122, 29.018, 23.008.
affected:		X	Test specifications	
		X	O&M Specifications	
Other comments: ⌘				

How to create CRs using this form:

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

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

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

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

*********************FIRST MODIFIED SECTION*****************

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"

[xx]	3GPP TS 23.251: "Network sharing - Architecture and functional description".

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions below apply. Terms and definitions not defined below can be found in [35].

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

1. The RNC has the capability to generate and send Cell Load Information towards the target/source system.

2. The RNC has the capability to receive Cell Load Information from the target/source system, and is able to interpret this information.

3. The ability of the RNC to make a handover decision by comparing the Cell Load Information that it has received from the target system with the Cell Load Information it has about its own cells.

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

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

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

Elementary Procedure: RANAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the RNS and the CN. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several RANAP EPs together with each other and EPs from other interfaces can be found in reference [4].

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

-   **Class 1:** Elementary Procedures with response (success and/or failure).

-   **Class 2:** Elementary Procedures without response.

-   **Class 3:** Elementary Procedures with possibility of multiple responses.

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

Successful:

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

Unsuccessful:

-   A signalling message explicitly indicates that the EP failed.

-   On time supervision expiry (i.e. absence of expected response).

Successful and Unsuccessful:

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

Class 2 EPs are considered always successful.

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

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

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

Management Based Activation: as defined in [37].

Network sharing supporting UE: as defined in [xx].

PUESBINE feature: as defined in [33].

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

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

- one RNS within UMTS to another relocation target external to UMTS;

- functionality equivalent to the serving RNS role from another relocation source external to UMTS to another RNS.

RAN Information Management: as defined in [36].

Trace Recording Session: as defined in [37].

Trace Recording Session Reference: as defined in [37].

Trace Reference: as defined in [37].

Trace Session: as defined in [37].

Serving RNC: SRNC is the RNC belonging to SRNS

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

Signalling Based Activation: as defined in [37].

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

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

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

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

UE Specific Behaviour Information – Iu: as defined in [33].

******************* NEXT MODIFIED SECTION******************

8.22   Initial UE Message

8.22.1   General

The purpose of the Initial UE Message procedure is to establish an Iu signalling connection between a CN domain and the RNC and to transfer the initial NAS-PDU to the CN node as determined by the NAS Node Selection Function - if this function is active, or otherwise to the default CN node. The procedure uses connection oriented signalling.

8.22.2   Successful Operation

Figure 24: Initial UE Message procedure. Successful operation.

When the RNC has received from radio interface a NAS message (see [8]) to be forwarded to a CN domain to which no Iu signalling connection for the UE exists, the RNC shall initiate the Initial UE Message procedure and send the INITIAL UE MESSAGE message to the CN. If NNSF is active, the selection of the CN node is made according to [26].

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

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

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

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

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

- Iu signalling connection identifier.

- Global RNC identifier.

- Selected PLMN Identity, if received from radio interface by a network sharing supporting UE in shared networks.

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

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

8.22.2.1 Successful Operation for GERAN Iu-mode

For GERAN Iu-mode, the following shall apply in addition for the successful operation of the Initial UE Message procedure:

- In case of establishment of a signalling connection towards the CS domain in GERAN Iu-mode, the INITIAL UE MESSAGE message shall contain the *GERAN Classmark* IE in order to provide the CN with GERAN-specific information (see [27]).

*******************NEXT MODIFIED SECTION*****************

9.1.33 INITIAL UE MESSAGE

This message is sent by the RNC to transfer the radio interface initial layer 3 message to the CN.

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
CN Domain Indicator	M		9.2.1.5		YES	ignore
LAI	M		9.2.3.6		YES	ignore
RAC	C - ifPS		9.2.3.7		YES	ignore
SAI	M		9.2.3.9		YES	ignore
NAS-PDU	M		9.2.3.5		YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global RNC-ID	M		9.2.1.39		YES	ignore
GERAN Classmark	O		9.2.1.57		YES	ignore
Selected PLMN Identity	O		9.2.3.x1		YES	ignore

Condition	Explanation
ifPS	This IE shall be present if the *CN Domain Indicator* IE is set to "PS domain".

9.2.3. x1 Selected PLMN Identity

This information element indicates the selected core network operator indicated by a network sharing supporting UE, in shared networks.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Selected PLMN ID	M		OCTET STRING (SIZE (3))	- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).

*******************NEXT MODIFIED SECTION*****************

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
    AccuracyFulfilmentIndicator,
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    ClientType,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GERAN-BSC-Container,
    GERAN-Classmark,
```

```
        GlobalCN-ID,
        GlobalRNC-ID,
        InformationTransferID,
        InformationTransferType,
        InterSystemInformationTransferType,
        IntegrityProtectionInformation,
        InterSystemInformation-TransparentContainer,
        IuSignallingConnectionIdentifier,
        IuTransportAssociation,
        KeyStatus,
        L3-Information,
        LAI,
        LastKnownServiceArea,
        NAS-PDU,
        NAS-SynchronisationIndicator,
        NewBSS-To-OldBSS-Information,
        NonSearchingIndication,
        NumberOfSteps,
        OMC-ID,
        OldBSS-ToNewBSS-Information,
        PagingAreaID,
        PagingCause,
        PDP-TypeInformation,
        PermanentNAS-UE-ID,
        PositionData,
        PositionDataSpecificToGERANIuMode,
        PositioningPriority,
        ProvidedData,
        RAB-ID,
        RAB-Parameters,
        RAC,
        RelocationType,
        RequestType,
        Requested-RAB-Parameter-Values,
        ResponseTime,
        RRC-Container,
        SAI,
        SAPI,
        Service-Handover,
        SNA-Access-Information,
        SourceID,
        SourceRNC-ToTargetRNC-TransparentContainer,
        TargetID,
        TargetRNC-ToSourceRNC-TransparentContainer,
        TemporaryUE-ID,
        TracePropagationParameters,
        TraceReference,
        TraceType,
        UnsuccessfullyTransmittedDataVolume,
        TransportLayerAddress,
        TriggerID,
        UE-ID,
        UESBI-Iu,
        UL-GTP-PDU-SequenceNumber,
        UL-N-PDU-SequenceNumber,
        UP-ModeVersions,
        UserPlaneMode,
        VerticalAccuracyCode,
        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-AccuracyFulfilmentIndicator,
id-AreaIdentity,
id-Alt-RAB-Parameters,
id-Ass-RAB-Parameters,
id-BroadcastAssistanceDataDecipheringKeys,
id-LocationRelatedDataRequestType,
id-CN-DomainIndicator,
id-Cause,
id-ChosenEncryptionAlgorithm,
id-ChosenIntegrityProtectionAlgorithm,
id-ClassmarkInformation2,
id-ClassmarkInformation3,
id-ClientType,
id-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GERAN-BSC-Container,
id-GERAN-Classmark,
id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item,
id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse,
id-GlobalCN-ID,
id-GlobalRNC-ID,
id-InformationTransferID,
id-InformationTransferType,
id-IntegrityProtectionInformation,
id-InterSystemInformationTransferType,
id-InterSystemInformation-TransparentContainer,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-LocationRelatedDataRequestTypeSpecificToGERANIuMode,
id-NAS-PDU,
id-NewBSS-To-OldBSS-Information,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
id-PositionData,
id-PositionDataSpecificToGERANIuMode,
id-PositioningPriority,
id-ProvidedData,
id-RAB-ContextItem,
id-RAB-ContextList,
id-RAB-ContextFailedtoTransferItem,
id-RAB-ContextFailedtoTransferList,
id-RAB-ContextItem-RANAP-RelocInf,
id-RAB-ContextList-RANAP-RelocInf,
id-RAB-DataForwardingItem,
id-RAB-DataForwardingItem-SRNS-CtxReq,
id-RAB-DataForwardingList,
id-RAB-DataForwardingList-SRNS-CtxReq,
id-RAB-DataVolumeReportItem,
id-RAB-DataVolumeReportList,
id-RAB-DataVolumeReportRequestItem,
id-RAB-DataVolumeReportRequestList,
id-RAB-FailedItem,
id-RAB-FailedList,
id-RAB-FailedtoReportItem,
id-RAB-FailedtoReportList,
id-RAB-ID,
id-RAB-ModifyList,
id-RAB-ModifyItem,
id-RAB-QueuedItem,
id-RAB-QueuedList,
```

```
        id-RAB-ReleaseFailedList,
        id-RAB-ReleaseItem,
        id-RAB-ReleasedItem-IuRelComp,
        id-RAB-ReleaseList,
        id-RAB-ReleasedItem,
        id-RAB-ReleasedList,
        id-RAB-ReleasedList-IuRelComp,
        id-RAB-RelocationReleaseItem,
        id-RAB-RelocationReleaseList,
        id-RAB-SetupItem-RelocReq,
        id-RAB-SetupItem-RelocReqAck,
        id-RAB-SetupList-RelocReq,
        id-RAB-SetupList-RelocReqAck,
        id-RAB-SetupOrModifiedItem,
        id-RAB-SetupOrModifiedList,
        id-RAB-SetupOrModifyItem,
        id-RAB-SetupOrModifyList,
        id-RAC,
        id-RelocationType,
        id-RequestType,
        id-ResponseTime,
        id-SAI,
        id-SAPI,
        id-SelectedPLMN-ID,
        id-SNA-Access-Information,
        id-SourceID,
        id-SourceRNC-ToTargetRNC-TransparentContainer,
        id-SourceRNC-PDCP-context-info,
        id-TargetID,
        id-TargetRNC-ToSourceRNC-TransparentContainer,
        id-TemporaryUE-ID,
        id-TracePropagationParameters,
        id-TraceReference,
        id-TraceType,
        id-TransportLayerAddress,
        id-TriggerID,
        id-UE-ID,
        id-UESBI-Iu,
        id-UL-GTP-PDU-SequenceNumber,
        id-VerticalAccuracyCode
FROM RANAP-Constants;
```

*******************NEXT MODIFIED SECTION*****************

```
-- *************************************************************
--
-- INITIAL UE MESSAGE ELEMENTARY PROCEDURE
--
-- *************************************************************

-- *************************************************************
--
-- Initial UE Message
--
-- *************************************************************

InitialUE-Message ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { {InitialUE-MessageIEs} },
    protocolExtensions    ProtocolExtensionContainer { {InitialUE-MessageExtensions} }
    OPTIONAL,
    ...
}

InitialUE-MessageIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator        CRITICALITY ignore  TYPE CN-DomainIndicator
    PRESENCE mandatory  } |
    { ID id-LAI               CRITICALITY ignore  TYPE LAI                    PRESENCE mandatory
    } |
    { ID id-RAC               CRITICALITY ignore  TYPE RAC                    PRESENCE conditional

    -- This IE shall be present if the CN Domain Indicator IE is set to "PS domain"  --
                        } |
```

```
        { ID id-SAI                    CRITICALITY ignore  TYPE SAI                      PRESENCE mandatory
        } |
        { ID id-NAS-PDU                CRITICALITY ignore  TYPE NAS-PDU                  PRESENCE
mandatory    } |
        { ID id-IuSigConId             CRITICALITY ignore  TYPE IuSignallingConnectionIdentifier
        PRESENCE mandatory  } |
        { ID id-GlobalRNC-ID           CRITICALITY ignore  TYPE GlobalRNC-ID             PRESENCE
mandatory    },

    ...
}

InitialUE-MessageExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark               CRITICALITY ignore  EXTENSION GERAN-Classmark
    PRESENCE optional    } |
-- Extension for Release 6 to convey the selected PLMN id in shared networks --
    { ID id-SelectedPLMN-ID     CRITICALITY ignore  EXTENSION PLMNidentity      PRESENCE optional
    } ,
    ...
}
```

*********************NEXT MODIFIED SECTION******************

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

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

id-AreaIdentity                             INTEGER ::= 0
id-CN-DomainIndicator                       INTEGER ::= 3
id-Cause                                    INTEGER ::= 4
id-ChosenEncryptionAlgorithm                INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm       INTEGER ::= 6
id-ClassmarkInformation2                    INTEGER ::= 7
id-ClassmarkInformation3                    INTEGER ::= 8
id-CriticalityDiagnostics                   INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber                INTEGER ::= 10
id-EncryptionInformation                    INTEGER ::= 11
id-IntegrityProtectionInformation           INTEGER ::= 12
id-IuTransportAssociation                   INTEGER ::= 13
id-L3-Information                           INTEGER ::= 14
id-LAI                                      INTEGER ::= 15
id-NAS-PDU                                  INTEGER ::= 16
id-NonSearchingIndication                   INTEGER ::= 17
id-NumberOfSteps                            INTEGER ::= 18
id-OMC-ID                                   INTEGER ::= 19
id-OldBSS-ToNewBSS-Information              INTEGER ::= 20
id-PagingAreaID                             INTEGER ::= 21
```

```
id-PagingCause                                      INTEGER ::= 22
id-PermanentNAS-UE-ID                               INTEGER ::= 23
id-RAB-ContextItem                                  INTEGER ::= 24
id-RAB-ContextList                                  INTEGER ::= 25
id-RAB-DataForwardingItem                           INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq               INTEGER ::= 27
id-RAB-DataForwardingList                           INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq               INTEGER ::= 29
id-RAB-DataVolumeReportItem                         INTEGER ::= 30
id-RAB-DataVolumeReportList                         INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem                  INTEGER ::= 32
id-RAB-DataVolumeReportRequestList                  INTEGER ::= 33
id-RAB-FailedItem                                   INTEGER ::= 34
id-RAB-FailedList                                   INTEGER ::= 35
id-RAB-ID                                           INTEGER ::= 36
id-RAB-QueuedItem                                   INTEGER ::= 37
id-RAB-QueuedList                                   INTEGER ::= 38
id-RAB-ReleaseFailedList                            INTEGER ::= 39
id-RAB-ReleaseItem                                  INTEGER ::= 40
id-RAB-ReleaseList                                  INTEGER ::= 41
id-RAB-ReleasedItem                                 INTEGER ::= 42
id-RAB-ReleasedList                                 INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp                       INTEGER ::= 44
id-RAB-RelocationReleaseItem                        INTEGER ::= 45
id-RAB-RelocationReleaseList                        INTEGER ::= 46
id-RAB-SetupItem-RelocReq                           INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck                        INTEGER ::= 48
id-RAB-SetupList-RelocReq                           INTEGER ::= 49
id-RAB-SetupList-RelocReqAck                        INTEGER ::= 50
id-RAB-SetupOrModifiedItem                          INTEGER ::= 51
id-RAB-SetupOrModifiedList                          INTEGER ::= 52
id-RAB-SetupOrModifyItem                            INTEGER ::= 53
id-RAB-SetupOrModifyList                            INTEGER ::= 54
id-RAC                                              INTEGER ::= 55
id-RelocationType                                   INTEGER ::= 56
id-RequestType                                      INTEGER ::= 57
id-SAI                                              INTEGER ::= 58
id-SAPI                                             INTEGER ::= 59
id-SourceID                                         INTEGER ::= 60
id-SourceRNC-ToTargetRNC-TransparentContainer       INTEGER ::= 61
id-TargetID                                         INTEGER ::= 62
id-TargetRNC-ToSourceRNC-TransparentContainer       INTEGER ::= 63
id-TemporaryUE-ID                                   INTEGER ::= 64
id-TraceReference                                   INTEGER ::= 65
id-TraceType                                        INTEGER ::= 66
id-TransportLayerAddress                            INTEGER ::= 67
id-TriggerID                                        INTEGER ::= 68
id-UE-ID                                            INTEGER ::= 69
id-UL-GTP-PDU-SequenceNumber                        INTEGER ::= 70
id-RAB-FailedtoReportItem                           INTEGER ::= 71
id-RAB-FailedtoReportList                           INTEGER ::= 72
id-KeyStatus                                        INTEGER ::= 75
id-DRX-CycleLengthCoefficient                       INTEGER ::= 76
id-IuSigConIdList                                   INTEGER ::= 77
id-IuSigConIdItem                                   INTEGER ::= 78
id-IuSigConId                                       INTEGER ::= 79
id-DirectTransferInformationItem-RANAP-RelocInf     INTEGER ::= 80
id-DirectTransferInformationList-RANAP-RelocInf     INTEGER ::= 81
id-RAB-ContextItem-RANAP-RelocInf                   INTEGER ::= 82
id-RAB-ContextList-RANAP-RelocInf                   INTEGER ::= 83
id-RAB-ContextFailedtoTransferItem                  INTEGER ::= 84
id-RAB-ContextFailedtoTransferList                  INTEGER ::= 85
id-GlobalRNC-ID                                     INTEGER ::= 86
id-RAB-ReleasedItem-IuRelComp                       INTEGER ::= 87
id-MessageStructure                                 INTEGER ::= 88
id-Alt-RAB-Parameters                               INTEGER ::= 89
id-Ass-RAB-Parameters                               INTEGER ::= 90
id-RAB-ModifyList                                   INTEGER ::= 91
id-RAB-ModifyItem                                   INTEGER ::= 92
id-TypeOfError                                      INTEGER ::= 93
id-BroadcastAssistanceDataDecipheringKeys           INTEGER ::= 94
id-LocationRelatedDataRequestType                   INTEGER ::= 95
id-GlobalCN-ID                                      INTEGER ::= 96
id-LastKnownServiceArea                             INTEGER ::= 97
id-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-SelectedPLMN-ID                                           INTEGER ::= xxx
```

********************* END OF MODIFICATIONS******************

CR-Form-v7.1

CHANGE REQUEST

⌘   **25.413** CR **702**   ⌘**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 **X** Core Network **X**

Title: ⌘	Rerouting in MOCN
Source: ⌘	RAN3
Work item code:⌘	NTShar-UTRANEnh ***Date:*** ⌘ 18/11/2004

Category: ⌘ **B**	***Release:*** ⌘ Rel-6

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

Use one of the following releases:
  Ph2   (GSM Phase 2)
  R96   (Release 1996)
  R97   (Release 1997)
  R98   (Release 1998)
  R99   (Release 1999)
  Rel-4   (Release 4)
  Rel-5   (Release 5)
  Rel-6   (Release 6)
  Rel-7   (Release 7)

Reason for change: ⌘	Rerouting is a mechanism used as part of the assignment of CN operator in shared networks MOCN configuration for non-supporting UEs when perform initial registration. In this case RNC will not know which CN to assign and the initial UE request message may be redirected to another CN via RNC.
Summary of change:⌘	A network sharing non-supporting UE in MOCN configuration will not be able to indicate the selected PLMN in RRC signalling to the RNC. The first attemted CN (and subsequent ones) will be aware whether the UE is network sharing supporting or not if needed thank the presence or absence of the *selected PLMN id* IE. If the CN is not be able to serve the UE request, it shall then request rerouting via a *redirection indication* in the Direct Transfer message, downlink direction to the RNC. The reject cause and the reject message will also be sent from the attempted CN to the RNC. The RNC will then forward the initial UE attach request message to another CN until it finds a CN that can serve the UE. If non of the CNs in the shared network can serve the UE request, a reject message with an appropriate reject cause will be sent to the UE. When redirection is completed it will be indicated in the Redirection Completed IE to the RNC.
Consequences if ⌘ ***not approved:***	
Clauses affected: ⌘	2, 3.1, 3.3, 8.22.2, 8.23.2.1, 9.133, 9.1.34, 9.2.3.x, 9.2.3.z, 9.2.3.y, 9.3.3, 9.3.4, 9.3.6

Y	N

Other specs	⌘	X		Other core specifications	⌘	TS 23.251, TS 24.007, TS 25.410, TS 25.401, CR067r4 to 24.007, CR 927 to TS 24.008
affected:			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

How to create CRs using this form:

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

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

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

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

2 References

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

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

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

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

[1]	3GPP TR 23.930 (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"

[xx]   3GPP TS 23.251: "Network sharing - Architecture and functional description".

******************** NEXT MODIFIED SECTION*****************

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions below apply. Terms and definitions not defined below can be found in [35].

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

1. The RNC has the capability to generate and send Cell Load Information towards the target/source system.

2. The RNC has the capability to receive Cell Load Information from the target/source system, and is able to interpret this information.

3. The ability of the RNC to make a handover decision by comparing the Cell Load Information that it has received from the target system with the Cell Load Information it has about its own cells.

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

Core Network operator: as defined in [xx]

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

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

Elementary Procedure: RANAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the RNS and the CN. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several RANAP EPs together with each other and EPs from other interfaces can be found in reference [4].

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

- **Class 1:** Elementary Procedures with response (success and/or failure).

- **Class 2:** Elementary Procedures without response.

- **Class 3:** Elementary Procedures with possibility of multiple responses.

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

Successful:

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

Unsuccessful:

- A signalling message explicitly indicates that the EP failed.

- On time supervision expiry (i.e. absence of expected response).

Successful and Unsuccessful:

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

Class 2 EPs are considered always successful.

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

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

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

Management Based Activation: as defined in [37].

Multi-Operator Core Network: as defined in [xx].

Network sharing non-supporting UE: as defined in [xx]

PUESBINE feature: as defined in [33].

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

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

- one RNS within UMTS to another relocation target external to UMTS;

- functionality equivalent to the serving RNS role from another relocation source external to UMTS to another RNS.

RAN Information Management: as defined in [36].

Trace Recording Session: as defined in [37].

Trace Recording Session Reference: as defined in [37].

Trace Reference: as defined in [37].

Trace Session: as defined in [37].

Serving RNC: SRNC is the RNC belonging to SRNS

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

Signalling Based Activation: as defined in [37].

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

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

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

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

UE Specific Behaviour Information – Iu: as defined in [33].

********************* NEXT MODIFIED SECTION*****************

3.3 Abbreviations

Applicable abbreviations can be found in [35]. For the purposes of the present document, the following abbreviations apply:

AAL2	ATM Adaptation Layer type 2
ALCAP	Access Link Control Application Part
AS	Access Stratum
ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
BSC	Base Station Controller
CC	Call Control
CN	Core Network
CRNC	Controlling RNC

CS	Circuit Switched
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel
EP	Elementary Procedure
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
MM	Mobility Management
MOCN	Multi Operator Core Network
MSC	Mobile services Switching Center
NACC	Network Assisted Cell Change
NAS	Non Access Stratum
NNSF	NAS Node Selection Function
NRT	Non-Real Time
N-PDU	Network – Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PS	Packet Switched
PUESBINE	Provision of UE Specific Behaviour Information to Network Entities
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RIM	RAN Information Management
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
RT	Real Time
SAI	Service Area Identifier
SAP	Service Access Point
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SNA	Shared Network Area
SNAC	Shared Network Area Code
SRNC	Serving RNC
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
UESBI-Iu	UE Specific Behaviour Information - Iu
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

8.22   Initial UE Message

8.22.1   General

The purpose of the Initial UE Message procedure is to establish an Iu signalling connection between a CN domain and the RNC and to transfer the initial NAS-PDU to the CN node as determined by the NAS Node Selection Function - if this function is active, or otherwise to the default CN node- or by the Rerouting Function (see [2]) in case of MOCN configuration. The procedure uses connection oriented signalling.

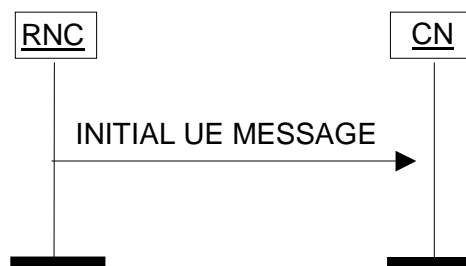## 8.22.2   Successful Operation

Figure 24: Initial UE Message procedure. Successful operation.

When the RNC has received from radio interface a NAS message (see [8]) to be forwarded to a CN domain to which no Iu signalling connection for the UE exists, the RNC shall initiate the Initial UE Message procedure and send the INITIAL UE MESSAGE message to the CN. If NNSF is active, the selection of the CN node is made according to [26].

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

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

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

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

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

-    Iu signalling connection identifier.

-    Global RNC identifier.

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

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

Interaction with Direct Transfer procedure

In MOCN configuration, if the RNC receives the *Redirection Indication* IE in the DIRECT TRANSFER message from a CN node which is not the last attempted, it shall initiate the Initial UE Message procedure towards another CN operator when possible, with the following additional information in the INITIAL UE MESSAGE message:

- *NAS Sequence Number* IE, if received from previously attempted CN operator;

- *Permanent NAS UE Identity* IE, if received from one of previously attempted CN operators.

8.22.2.1 Successful Operation for GERAN Iu-mode

For GERAN Iu-mode, the following shall apply in addition for the successful operation of the Initial UE Message procedure:

- In case of establishment of a signalling connection towards the CS domain in GERAN Iu-mode, the INITIAL UE MESSAGE message shall contain the *GERAN Classmark* IE in order to provide the CN with GERAN-specific information (see [27]).

8.23 Direct Transfer

8.23.1 General

The purpose of the Direct Transfer procedure is to carry UE – CN signalling messages over the Iu Interface. The UE - CN signalling messages are not interpreted by the UTRAN, and their content (e.g. MM or CC message) is outside the scope of this specification (see [8]). The UE – CN signalling messages are transported as a parameter in the DIRECT TRANSFER messages. The procedure uses connection oriented signalling.

8.23.2 Successful Operation

8.23.2.1 CN Originated Direct Transfer

Figure 25: Direct Transfer, CN originated. Successful operation.

If a UE - CN signalling message has to be sent from the CN to the UE, the CN shall send a DIRECT TRANSFER message to the RNC including the UE - CN signalling message as a *NAS-PDU* IE.

If the DIRECT TRANSFER message is sent in the downlink direction, it shall include the *SAPI* IE and shall not include the *LAI + RAC* IE and the *SAI* IE. The use of the *SAPI* IE included in the DIRECT TRANSFER message enables the UTRAN to provide specific service for the transport of the included NAS message.

In case of rerouting in MOCN configuration:

If the CN can serve the network sharing non-supporting UE, the *NAS-PDU* IE - i.e. the accept NAS message - and the *Redirection completed* IE shall be included in the DIRECT TRANSFER message for the downlink direction.

If the CN cannot serve the network sharing non-supporting UE, the *NAS-PDU* IE - i.e. the reject NAS message - and a *Redirection Indication* IE shall be included in the DIRECT TRANSFER message for the downlink direction.

The *Redirection Indication* IE shall contain:

- The *initial NAS-PDU* IE received from the UE;

- The *Reject Cause Value* IE;

- The *NAS Sequence Number* IE, if available for CS;

- The *Permanent NAS UE Identity* IE, if available.

Upon reception of the downlink DIRECT TRANSFER message including the *Redirection Indication* IE, the RNC shall release the Iu signalling connection and store as part of the Rerouting Function the associated Reject Cause value and *NAS-PDU* IE related to this CN.

In case all attempted CN operators have replied with the *Redirection Indication* IE, the RNC shall select the most appropriate NAS-PDU among the *NAS-PDU* IEs received from the attempted CN nodes based on the stored information as part of the Rerouting function and send it back to the UE.

Upon reception of the downlink DIRECT TRANSFER message including the *Redirection Completed* IE, the RNC shall send back the included NAS-PDU IE to the UE and terminate the Rerouting Function.

8.23.2.2   UTRAN Originated Direct Transfer

Figure 26: Direct Transfer, RNC originated. Successful operation.

If a UE - CN signalling message has to be sent from the RNC to the CN without interpretation, the RNC shall send a DIRECT TRANSFER message to the CN including the UE - CN signalling message as a *NAS-PDU* IE.

If the DIRECT TRANSFER message shall be sent to the PS domain, the RNC shall also add the *LAI* and the *RAC* IEs, which were the last LAI + RAC indicated to the UE by the UTRAN via the current RRC connection, or if the UTRAN had not yet indicated any LAI + RAC to the UE via the current RRC connection, then the LAI + RAC of the cell via which the current RRC connection was established. If the DIRECT TRANSFER message is sent to the PS domain, the RNC shall also add a Service Area corresponding to at least one of the cells from which the UE is consuming radio resources. If the DIRECT TRANSFER message is sent in uplink direction, the RNC shall not include the *SAPI* IE.

8.23.3   Abnormal Conditions

If the DIRECT TRANSFER message is sent by the RNC to the PS domain, and any of the *LAI* IE, *RAC* IE or *SAI* IE is missing, the CN shall continue with the Direct Transfer procedure, ignoring the missing IE.

If the DIRECT TRANSFER message is sent by the CN to the RNC without the *SAPI* IE, the RNC shall continue with the Direct Transfer procedure.

******************** NEXT MODIFIED SECTION*****************

9.1.33   INITIAL UE MESSAGE

This message is sent by the RNC to transfer the radio interface initial layer 3 message to the CN.

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
CN Domain Indicator	M		9.2.1.5		YES	ignore
LAI	M		9.2.3.6		YES	ignore
RAC	C - ifPS		9.2.3.7		YES	ignore
SAI	M		9.2.3.9		YES	ignore
NAS-PDU	M		9.2.3.5		YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global RNC-ID	M		9.2.1.39		YES	ignore
GERAN Classmark	O		9.2.1.57		YES	ignore
NAS Sequence Number	O		9.2.3.x		YES	Ignore
Permanent NAS UE Identity	O		9.2.3.1		YES	Ignore

Condition	Explanation
ifPS	This IE shall be present if the *CN Domain Indicator* IE is set to "PS domain".

9.1.34   DIRECT TRANSFER

This message is sent by both the CN and the RNC and is used for carrying NAS information over the Iu interface.

Direction: RNC → CN and 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
NAS-PDU	M		9.2.3.5		YES	ignore
LAI	O		9.2.3.6		YES	ignore
RAC	O		9.2.3.7		YES	ignore
SAI	O		9.2.3.9		YES	ignore
SAPI	O		9.2.3.8		YES	ignore
Redirection Indication	O		9.2.3.y		YES	ignore
Redirection Completed	O		9.2.3.z		YES	ignore

********************* **NEXT MODIFIED SECTION*******************

9.2.3.x   NAS Sequence Number

This IE is transparent for UTRAN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NAS Sequence Number	M		BIT STRING (SIZE(2))	Contains the value of the N(SD) as defined in [8].

9.2.3.z   Redirection Completed

This IE indicates to RNC that the redirection is completed.

Direction: CN → RNC

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Redirection Completed	M		ENUMERATED (redirection completed, …)	

9.2.3.y   Redirection Indication

This IE is used by a CN to request rerouting by the RNC to another CN operator. It is only used in MOCN configuration for network sharing non-supporting UEs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Redirection Indication						
> initial NAS-PDU	M		9.2.3.5	The initial NAS-PDU received from UE	YES	ignore
> Reject Cause Value	M		ENUMERATED (PLMN not allowed, location area not allowed, roaming not allowed in this location area, no suitable cell in location area, GPRS services not allowed in this PLMN, …)	This IE lists cause values which meaning is defined in [8].	YES	ignore
> NAS Sequence Number	O		9.2.3.x		YES	ignore
> Permanent NAS UE Identity	O		9.2.3.1		YES	ignore

********************* **NEXT MODIFIED SECTION**********************

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
    AccuracyFulfilmentIndicator,
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    ClientType,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GERAN-BSC-Container,
    GERAN-Classmark,
    GlobalCN-ID,
    GlobalRNC-ID,
    InformationTransferID,
    InformationTransferType,
    InterSystemInformationTransferType,
    IntegrityProtectionInformation,
    InterSystemInformation-TransparentContainer,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
    L3-Information,
    LAI,
    LastKnownServiceArea,
    NAS-PDU,
    NAS-SequenceNumber,
    NAS-SynchronisationIndicator,
    NewBSS-To-OldBSS-Information,
    NonSearchingIndication,
    NumberOfSteps,
    OMC-ID,
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    PositionData,
    PositionDataSpecificToGERANIuMode,
    PositioningPriority,
    ProvidedData,
    RAB-ID,
    RAB-Parameters,
    RAC,
    RedirectionCompleted,
    RejectCauseValue,
    RelocationType,
    RequestType,
    Requested-RAB-Parameter-Values,
    ResponseTime,
    RRC-Container,
    SAI,
    SAPI,
    Service-Handover,
    SNA-Access-Information,
    SourceID,
    SourceRNC-ToTargetRNC-TransparentContainer,
    TargetID,
    TargetRNC-ToSourceRNC-TransparentContainer,
    TemporaryUE-ID,
    TracePropagationParameters,
    TraceReference,
```

```
      TraceType,
      UnsuccessfullyTransmittedDataVolume,
      TransportLayerAddress,
      TriggerID,
      UE-ID,
      UESBI-Iu,
      UL-GTP-PDU-SequenceNumber,
      UL-N-PDU-SequenceNumber,
      UP-ModeVersions,
      UserPlaneMode,
      VerticalAccuracyCode,
      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-AccuracyFulfilmentIndicator,
      id-AreaIdentity,
      id-Alt-RAB-Parameters,
      id-Ass-RAB-Parameters,
      id-BroadcastAssistanceDataDecipheringKeys,
      id-LocationRelatedDataRequestType,
      id-CN-DomainIndicator,
      id-Cause,
      id-ChosenEncryptionAlgorithm,
      id-ChosenIntegrityProtectionAlgorithm,
      id-ClassmarkInformation2,
      id-ClassmarkInformation3,
      id-ClientType,
      id-CriticalityDiagnostics,
      id-DRX-CycleLengthCoefficient,
      id-DirectTransferInformationItem-RANAP-RelocInf,
      id-DirectTransferInformationList-RANAP-RelocInf,
      id-DL-GTP-PDU-SequenceNumber,
      id-EncryptionInformation,
      id-GERAN-BSC-Container,
      id-GERAN-Classmark,
      id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item,
      id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse,
      id-GlobalCN-ID,
      id-GlobalRNC-ID,
      id-InformationTransferID,
      id-InformationTransferType,
      id-IntegrityProtectionInformation,
      id-InterSystemInformationTransferType,
      id-InterSystemInformation-TransparentContainer,
      id-IuSigConId,
      id-IuSigConIdItem,
      id-IuSigConIdList,
      id-IuTransportAssociation,
      id-KeyStatus,
      id-L3-Information,
      id-LAI,
      id-LastKnownServiceArea,
      id-LocationRelatedDataRequestTypeSpecificToGERANIuMode,
      id-NAS-PDU,
      id-NAS-SequenceNumber,
      id-NewBSS-To-OldBSS-Information,
      id-NonSearchingIndication,
      id-NumberOfSteps,
```

```
    id-OMC-ID,
    id-OldBSS-ToNewBSS-Information,
    id-PagingAreaID,
    id-PagingCause,
    id-PermanentNAS-UE-ID,
    id-PositionData,
    id-PositionDataSpecificToGERANIuMode,
    id-PositioningPriority,
    id-ProvidedData,
    id-RAB-ContextItem,
    id-RAB-ContextList,
    id-RAB-ContextFailedtoTransferItem,
    id-RAB-ContextFailedtoTransferList,
    id-RAB-ContextItem-RANAP-RelocInf,
    id-RAB-ContextList-RANAP-RelocInf,
    id-RAB-DataForwardingItem,
    id-RAB-DataForwardingItem-SRNS-CtxReq,
    id-RAB-DataForwardingList,
    id-RAB-DataForwardingList-SRNS-CtxReq,
    id-RAB-DataVolumeReportItem,
    id-RAB-DataVolumeReportList,
    id-RAB-DataVolumeReportRequestItem,
    id-RAB-DataVolumeReportRequestList,
    id-RAB-FailedItem,
    id-RAB-FailedList,
    id-RAB-FailedtoReportItem,
    id-RAB-FailedtoReportList,
    id-RAB-ID,
    id-RAB-ModifyList,
    id-RAB-ModifyItem,
    id-RAB-QueuedItem,
    id-RAB-QueuedList,
    id-RAB-ReleaseFailedList,
    id-RAB-ReleaseItem,
    id-RAB-ReleasedItem-IuRelComp,
    id-RAB-ReleaseList,
    id-RAB-ReleasedItem,
    id-RAB-ReleasedList,
    id-RAB-ReleasedList-IuRelComp,
    id-RAB-RelocationReleaseItem,
    id-RAB-RelocationReleaseList,
    id-RAB-SetupItem-RelocReq,
    id-RAB-SetupItem-RelocReqAck,
    id-RAB-SetupList-RelocReq,
    id-RAB-SetupList-RelocReqAck,
    id-RAB-SetupOrModifiedItem,
    id-RAB-SetupOrModifiedList,
    id-RAB-SetupOrModifyItem,
    id-RAB-SetupOrModifyList,
    id-RAC,
    id-RedirectionCompleted,
    id-RedirectionIndication,
    id-RejectCauseValue,
    id-RelocationType,
    id-RequestType,
    id-ResponseTime,
    id-SAI,
    id-SAPI,
    id-SNA-Access-Information,
    id-SourceID,
    id-SourceRNC-ToTargetRNC-TransparentContainer,
    id-SourceRNC-PDCP-context-info,
    id-TargetID,
    id-TargetRNC-ToSourceRNC-TransparentContainer,
    id-TemporaryUE-ID,
    id-TracePropagationParameters,
    id-TraceReference,
    id-TraceType,
    id-TransportLayerAddress,
    id-TriggerID,
    id-UE-ID,
    id-UESBI-Iu,
    id-UL-GTP-PDU-SequenceNumber,
    id-VerticalAccuracyCode
FROM RANAP-Constants;
```

```
-- ***********************************************************
--
-- INITIAL UE MESSAGE ELEMENTARY PROCEDURE
--
-- ***********************************************************

-- ***********************************************************
--
-- Initial UE Message
--
-- ***********************************************************

InitialUE-Message ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {InitialUE-MessageIEs} },
    protocolExtensions      ProtocolExtensionContainer { {InitialUE-MessageExtensions} }
    OPTIONAL,
    ...
}

InitialUE-MessageIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator
    PRESENCE mandatory   } |
    { ID id-LAI                CRITICALITY ignore  TYPE LAI                     PRESENCE mandatory
    } |
    { ID id-RAC                CRITICALITY ignore  TYPE RAC                     PRESENCE conditional

    -- This IE shall be present if the CN Domain Indicator IE is set to "PS domain"  --
                        } |
    { ID id-SAI                CRITICALITY ignore  TYPE SAI                     PRESENCE mandatory
    } |
    { ID id-NAS-PDU               CRITICALITY ignore  TYPE NAS-PDU                  PRESENCE
mandatory    } |
    { ID id-IuSigConId               CRITICALITY ignore  TYPE IuSignallingConnectionIdentifier
    PRESENCE mandatory   } |
    { ID id-GlobalRNC-ID               CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE
mandatory    },

    ...
}

InitialUE-MessageExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark               CRITICALITY ignore  EXTENSION GERAN-Classmark
    PRESENCE optional    } |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-
supporting UEs --
    { ID id-PermanentNAS-UE-ID,               CRITICALITY ignore  EXTENSION PermanentNAS-UE-ID
    PRESENCE optional    } |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-
supporting UEs --
    { ID id-NAS-SequenceNumber               CRITICALITY ignore  EXTENSION NAS-SequenceNumber
    PRESENCE optional    } ,
    ...
}

-- ***********************************************************
--
-- DIRECT TRANSFER ELEMENTARY PROCEDURE
--
-- ***********************************************************

-- ***********************************************************
--
-- Direct Transfer
--
-- ***********************************************************

DirectTransfer ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {DirectTransferIEs} },
```

```
    protocolExtensions       ProtocolExtensionContainer { {DirectTransferExtensions} }
    OPTIONAL,
    ...
}

DirectTransferIEs RANAP-PROTOCOL-IES ::= {
    { ID id-NAS-PDU                    CRITICALITY ignore  TYPE NAS-PDU                      PRESENCE
mandatory    } |
    { ID id-LAI                  CRITICALITY ignore  TYPE LAI                   PRESENCE optional }
|
    { ID id-RAC                  CRITICALITY ignore  TYPE RAC                   PRESENCE optional }
|
    { ID id-SAI                  CRITICALITY ignore  TYPE SAI                   PRESENCE optional }
|
    { ID id-SAPI                     CRITICALITY ignore  TYPE SAPI                     PRESENCE
optional    },
    ...
}

DirectTransferExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-
supporting UEs --
    { ID id-RedirectionIndication           CRITICALITY ignore  EXTENSION RedirectionIndication
            PRESENCE optional    }|
-- Extension for Release 6 to indicate the MOCN rerouting is completed --
    { ID id-RedirectionCompleted           CRITICALITY ignore  EXTENSION RedirectionCompleted
            PRESENCE optional    },
    ...
}

RedirectionIndication ::= ProtocolIE-Container { {RedirectionIndication-IEs} }

RedirectionIndication-IEs RANAP-PROTOCOL-IES ::= {
    {   ID id-NAS-PDU    CRITICALITY ignore TYPE NAS-PDU     PRESENCE mandatory },
    {   ID id-RejectCauseValue  CRITICALITY ignore TYPE RejectCauseValue    PRESENCE mandatory},
    {   ID id-NAS-SequenceNumber    CRITICALITY ignore TYPE NAS-SequenceNumber  PRESENCE optional},
    {   ID id-PermanentNAS-UE-ID    CRITICALITY ignore TYPE PermanentNAS-UE-ID  PRESENCE optional},
    ...
}
```

******************** NEXT MODIFIED SECTION*****************

9.3.4   Information Element Definitions

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


-- N


NAS-PDU                 ::= OCTET STRING

NAS-SequenceNumber          ::= BIT STRING (SIZE (2))
-- Reference: 24.008

NAS-SynchronisationIndicator    ::= BIT STRING (SIZE (4))

NewBSS-To-OldBSS-Information        ::= OCTET STRING

NonSearchingIndication ::= ENUMERATED {
    non-searching,
    searching
}

NRTLoadInformationValue ::= INTEGER (0..3)

NumberOfIuInstances        ::= INTEGER (1..2)
```

```
NumberOfSteps              ::= INTEGER (1..16)
```

```
-- 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 shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    deliveryOrder          DeliveryOrder,
    maxSDU-Size        MaxSDU-Size,
    sDU-Parameters         SDU-Parameters,
    transferDelay          TransferDelay OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    trafficHandlingPriority    TrafficHandlingPriority OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Interactive" --,
    allocationOrRetentionPriority   AllocationOrRetentionPriority OPTIONAL,
    sourceStatisticsDescriptor  SourceStatisticsDescriptor OPTIONAL
    -- This IE shall be present the traffic class IE is set to "Conversational" or "Streaming" --,
    relocationRequirement  RelocationRequirement OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {RAB-Parameters-ExtIEs} } OPTIONAL,
    ...
}

RAB-Parameters-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable indication that Interactive User Plane data is of a signalling
nature --
    { ID id-SignallingIndication   CRITICALITY ignore EXTENSION SignallingIndication PRESENCE
optional },
    ...
}

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,
    iE-Extensions          ProtocolExtensionContainer { { RAB-TrCH-MappingItem-ExtIEs} } OPTIONAL,
    ...
}

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    },
    ...
}

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
}


RedirectionCompleted     ::= ENUMERATED {
    redirection-completed,
    ...
}

RejectCauseValue ::= ENUMERATED {
    pLMN-Not-Allowed,
    location-Area-Not-Allowed,
    roaming-Not-Allowed-In-This-Location-Area,
    no-Suitable-Cell-In-Location-Area,
    gPRS-Services-Not-Allowed-In-This-PLMN,
    ...
}


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 ::= {
    ...
```

```
}

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,
    ...
}

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

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

ResponseTime    ::= ENUMERATED {
    lowdelay,
    delaytolerant,
...
}

RIMInformation                  ::= OCTET STRING

RIM-Transfer ::= SEQUENCE {
    rIMInformation          RIMInformation,
    rIMRoutingAddress           RIMRoutingAddress   OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {RIM-Transfer-ExtIEs} } OPTIONAL
}

RIM-Transfer-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RIMRoutingAddress ::= CHOICE {
    globalRNC-ID            GlobalRNC-ID,
    gERAN-Cell-ID           GERAN-Cell-ID,
    ...
}


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


RNCTraceInformation::= SEQUENCE {
    traceReference              TraceReference,
    traceActivationIndicator        ENUMERATED {activated,deactivated},
    equipmentsToBeTraced            EquipmentsToBeTraced
    OPTIONAL,
    -- This IE shall be present if the Trace Activation Indicator IE is set to "Activated".
    iE-Extensions               ProtocolExtensionContainer { { RNCTraceInformation-ExtIEs} }
    OPTIONAL
}

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

RRC-Container               ::= OCTET STRING

RTLoadValue ::= INTEGER (0..100)
```

******************** NEXT MODIFIED SECTION******************

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
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
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-RedirectionCompleted                                INTEGER ::= xxx
id-RedirectionIndication                               INTEGER ::= xxx
id-NAS-SequenceNumber                                  INTEGER ::= xxx
id-RejectCauseValue                                    INTEGER ::= xxx


END
```

******************** **END OF MODIFICATIONS**********************

CR-Form-v7.1

CHANGE REQUEST

| ⌘ | **TS25.413** CR | **CR715** | ⌘rev | **2** | ⌘ | 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 **X** Core Network **X**

Title:	⌘	Support of full Mobility/Backwards Compatibility in Network Sharing

Source:	⌘	RAN3

Work item code:	⌘	NTShar-UTRANEnh		**Date:** ⌘	15/11/2004

Category:	⌘	**B**		**Release:** ⌘	REL-6

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

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	The target RNC needs to know which Plmn to send to a network sharing supporting UE.

Summary of change:	⌘	The selected Plmn id is added in the RELOCATION REQUEST message, in the COMMON-ID message and text is added in the corresponding procedures.

Consequences if not approved:	⌘	

Clauses affected:	⌘	2, 3, 8.7, 8.16, 9.1.10, 9.1.24, 9.3.3

		Y	N		
Other specs	⌘	X		Other core specifications	⌘	TS25.413 CR701 and 702 TS25.401 CR092 TS25.410 CR058
affected:			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

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

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

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

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

2   References

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

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

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

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

[1]	3GPP TR 23.930 (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 23.251: "Network sharing - Architecture and functional description".

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions below apply. Terms and definitions not defined below can be found in [35].

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

1. The RNC has the capability to generate and send Cell Load Information towards the target/source system.

2. The RNC has the capability to receive Cell Load Information from the target/source system, and is able to interpret this information.

3. The ability of the RNC to make a handover decision by comparing the Cell Load Information that it has received from the target system with the Cell Load Information it has about its own cells.

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

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

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

Elementary Procedure: RANAP protocol consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the RNS and the CN. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several RANAP EPs together with each other and EPs from other interfaces can be found in reference [4].

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

- **Class 1:** Elementary Procedures with response (success and/or failure).

- **Class 2:** Elementary Procedures without response.

- **Class 3:** Elementary Procedures with possibility of multiple responses.

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

Successful:

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

Unsuccessful:

- A signalling message explicitly indicates that the EP failed.

- On time supervision expiry (i.e. absence of expected response).

Successful and Unsuccessful:

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

Class 2 EPs are considered always successful.

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

Gateway Core Network: as defined in [r1].

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

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

Management Based Activation: as defined in [37].

PUESBINE feature: as defined in [33].

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

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

-   one RNS within UMTS to another relocation target external to UMTS;

-   functionality equivalent to the serving RNS role from another relocation source external to UMTS to another RNS.

RAN Information Management: as defined in [36].

Trace Recording Session: as defined in [37].

Trace Recording Session Reference: as defined in [37].

Trace Reference: as defined in [37].

Trace Session: as defined in [37].

Serving RNC: SRNC is the RNC belonging to SRNS

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

Signalling Based Activation: as defined in [37].

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

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

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

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

UE Specific Behaviour Information – Iu: as defined in [33].

3.2   Symbols

Void.

3.3   Abbreviations

Applicable abbreviations can be found in [35]. For the purposes of the present document, the following abbreviations apply:

AAL2	ATM Adaptation Layer type 2
ALCAP	Access Link Control Application Part
AS	Access Stratum
ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
BSC	Base Station Controller
CC	Call Control
CN	Core Network
CRNC	Controlling RNC
CS	Circuit Switched
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift RNC
DRNS	Drift RNS
DSCH	Downlink Shared Channel
EP	Elementary Procedure
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio System
GSM	Global System for Mobile communications
GTP	GPRS Tunnelling Protocol
GWCN	GateWay Core Network
IE	Information Element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IPv4	Internet Protocol (version 4)
IPv6	Internet Protocol (version 6)
MM	Mobility Management
MSC	Mobile services Switching Center
NACC	Network Assisted Cell Change
NAS	Non Access Stratum
NNSF	NAS Node Selection Function
NRT	Non-Real Time
N-PDU	Network – Protocol Data Unit
OSP:IHOSS	Octet Stream Protocol: Internet-Hosted Octet Stream Service
P-TMSI	Packet TMSI
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PS	Packet Switched
PUESBINE	Provision of UE Specific Behaviour Information to Network Entities
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RIM	RAN Information Management
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RRC	Radio Resource Control
RT	Real Time
SAI	Service Area Identifier
SAP	Service Access Point
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SNA	Shared Network Area
SNAC	Shared Network Area Code

SRNC	Serving RNC
SRNS	Serving RNS
TEID	Tunnel Endpoint Identifier
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UEA	UMTS Encryption Algorithm
UESBI-Iu	UE Specific Behaviour Information - Iu
UIA	UMTS Integrity Algorithm
UL	Uplink
UMTS	Universal Mobile Telecommunications System
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

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
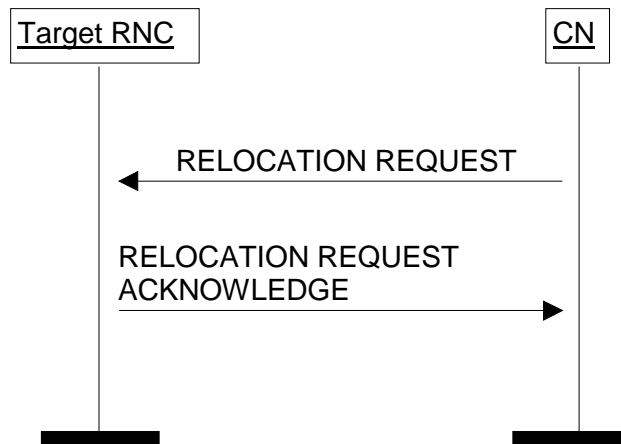
Figure 7: Relocation Resource Allocation procedure. Successful operation.

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.

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);

- *Selected PLMN ID* IE if in MOCN or GWCN configuration.

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".

If the *Selected PLMN ID* IE is contained in the RELOCATION REQUEST message, the target RNC shall use this information to send it to the UE.

8.7.2.1 Successful Operation for GERAN Iu-mode

The relocation between UTRAN and GERAN Iu-mode shall be considered in the Relocation Resource Allocation procedure as intra-system relocation from RANAP point of view.

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

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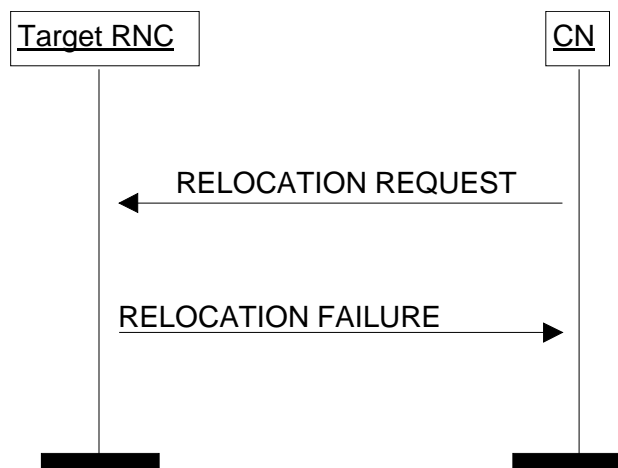
8.7.3 Unsuccessful Operation

Figure 8: 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 a RELOCATION FAILURE message to the CN. The RELOCATION FAILURE message shall contain the *Cause* IE with an appropriate value.

If the target RNC cannot support any of the integrity protection (ciphering respectively) alternatives provided in the *Integrity Protection Information* IE or *Encryption Information* IE, it shall return a RELOCATION FAILURE message with the cause "Requested Ciphering and/or Integrity Protection algorithms not supported".

If the target RNC cannot support the relocation due to PUESBINE feature, it shall return a RELOCATION FAILURE message with the cause "Incoming Relocation Not Supported Due To PUESBINE Feature".

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

When the CN receives a RELOCATION FAILURE message from the target RNC, it shall stop timer $T_{RELOCalloc}$ and shall assume possibly allocated resources within the target RNC completely released.

In case of inter-system handover, and if the target RNC supports cell load-based inter-system handover, then

- the *NewBSS to Old BSS Information* IE may be included in the RELOCATION FAILURE message. This information shall include, if available, the current traffic load in the target cell.

- the RELOCATION FAILURE message shall contain the *Cause* IE with an appropriate value, e.g. "No Radio Resources Available in Target Cell" or "Traffic Load In The Target Cell Higher Than In The Source Cell".

- If the *Cause* IE received in the RELOCATION REQUEST message contains the value "Reduce Load in Serving Cell" and the load in the target cell is greater than in the source cell then, if the target cell is not in a congested or blocked state, the RNC shall return a RELOCATION FAILURE message which may include the cause "Traffic Load In The Target Cell Higher Than In The Source Cell".

- When the RNC returns a RELOCATION FAILURE message with the cause "Traffic Load In The Target Cell Higher Than In The Source Cell", it shall also include the *NewBSS to Old BSS Information* IE. This information shall include the current traffic load in the target cell.

8.7.3.1 Unsuccessful Operation for GERAN Iu-mode

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

- In case a Relocation to GERAN Iu-mode fails (only for CS), because the Target BSC cannot provide an appropriate RAB corresponding to the content of the *GERAN BSC Container* IE (if received), the Target BSC shall report the unsuccessful Relocation Resource Allocation by indicating the cause value "GERAN Iu-mode Failure" within the RELOCATION FAILURE message and shall include the *GERAN Classmark* IE.

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.

If the target RNC receives a *Source RNC to Target RNC Transparent Container* IE containing *Chosen Integrity Protection* (*Encryption* respectively) *Algorithm* IE without *Integrity Protection* (*Ciphering* respectively) *Key* IE, it shall return a RELOCATION FAILURE message with the cause "Conflict with already existing Integrity protection and/or Ciphering information".

Interactions with Iu Release procedure:

If the CN decides to not continue the Relocation Resource Allocation procedure (e.g. due to $T_{RELOCalloc}$ expiry) before the Relocation Resource Allocation procedure is completed, the CN shall stop timer $T_{RELOCalloc}$ (if timer $T_{RELOCalloc}$ has not already expired) 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".

NOTE: In case two CN domains are involved in the Relocation Resource Allocation procedure, the target RNC may check whether the content of the two *Source RNC to Target RNC Transparent Container* IEs or the two *SNA Access Information* IEs is the same. In case the target RNC receives two different *Source RNC to Target RNC Transparent Container* IEs or two different *SNA Access Information* IEs, the RNC behaviour is left implementation specific.

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.

When both the CS and PS user data *Chosen Encryption Algorithm* IE are received within the *Source RNC to Target RNC Transparent Container* IE and if these two received *Chosen Encryption Algorithm* IE are not the same, the target RNC shall fail the Relocation Resource Allocation procedure by sending back a RELOCATION FAILURE message.

The integrity protection (ciphering respectively) alternatives provided in the *Integrity Protection Information* IE (*Encryption Information* IE respectively) of the RELOCATION REQUEST messages received from both CN domains shall have at least one common alternative, otherwise the Relocation Resource Allocation shall be failed by sending back a RELOCATION FAILURE message.

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 from each CN domain within the RELOCATION REQUEST messages, to co-ordinate both Iu signalling connections.

-       The target RNC shall generate and send RELOCATION REQUEST ACKNOWLEDGE messages only after all
        expected RELOCATION REQUEST messages are received and analysed.

-       If the target RNC decides to send the *Target RNC to Source RNC Transparent Container* IE via the two CN
        domains, the target RNC shall ensure that the same *Target RNC to Source RNC Transparent Container* IE is
        included in RELOCATION REQUEST ACKNOWLEDGE messages transmitted via the two CN domains and
        related to the same relocation of SRNS.

If the target RNC receives the *UESBI-Iu* IE on the Iu-CS but not on the Iu-PS interface (or vice versa), the RNC shall, if
supported, use the *UESBI-Iu* IE for both domains.

8.16   Common ID

8.16.1   General

The purpose of the Common ID procedure is to inform the RNC about the permanent NAS UE Identity (i.e. IMSI) of a user. This is used by the RNC e.g. to create a reference between the permanent NAS UE identity of the user and the RRC connection of that user for UTRAN paging co-ordination. The procedure may also be used to provide the *SNA Access Information* IE to the RNC.

The procedure uses connection oriented signalling.

8.16.2   Successful Operation

Figure 17: Common ID procedure. Successful operation.

After having established an Iu signalling connection, and if the Permanent NAS UE identity (i.e. IMSI) is available, the CN shall send to the RNC a COMMON ID message containing the *Permanent NAS UE Identity* IE and optionally the *SNA Access Information* IE. The COMMON ID message may also include the *UESBI-Iu* IE. 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.

The RNC shall, if supported, use the *UESBI-Iu* IE when received in the COMMON ID message.

If the *SNA Access Information* IE is contained in the COMMON ID message, the RNC shall store this information and use it to determine whether the UE has access to radio resources in the UTRAN. The RNC shall consider that the UE is authorised to access only the PLMNs identified by the *PLMN identity* IEs 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 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.

In case of GWCN configuration for a network sharing non-supporting UE, the COMMON ID message shall include, if available, the *Selected PLMN ID* IE. If received, the RNC shall store this information.

8.16.3   Abnormal Conditions

Not applicable.

9.1.10   RELOCATION REQUEST

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

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
Permanent NAS UE Identity	O		9.2.3.1		YES	ignore
Cause	M		9.2.1.4		YES	ignore
CN Domain Indicator	M		9.2.1.5		YES	reject
Source RNC To Target RNC Transparent Container	M		9.2.1.28		YES	reject
RABs To Be Setup List	O				YES	reject
>RABs To Be Setup Item IEs		1 to <maxnoofRABs>			EACH	reject
>>RAB ID	M		9.2.1.2		-	
>>NAS Synchronisation Indicator	O		9.2.3.18		-	
>>RAB Parameters	M		9.2.1.3		-	
>>Data Volume Reporting Indication	C – ifPS		9.2.1.17		-	
>> PDP Type Information	C – ifPS		9.2.1.40		-	
>>User Plane Information	M				-	
>>>User Plane Mode	M		9.2.1.18		-	
>>>UP Mode Versions	M		9.2.1.19		–	
>>Transport Layer Address	M		9.2.2.1		–	
>>Iu Transport Association	M		9.2.2.2		-	
>>Service Handover	O		9.2.1.41		-	
>> Alternative RAB Parameter Values	O		9.2.1.43		YES	Ignore
>>GERAN BSC Container	O		9.2.1.58		YES	Ignore
Integrity Protection Information	O		9.2.1.11	Integrity Protection Information includes key and permitted algorithms.	YES	ignore
Encryption Information	O		9.2.1.12	Encryption Information includes key and permitted algorithms.	YES	ignore
Iu Signalling Connection Identifier	M		9.2.1.38		YES	ignore
Global CN-ID	O		9.2.1.46		YES	reject
SNA Access Information	O		9.2.3.24		YES	ignore
UESBI-Iu	O		9.2.1.59		YES	ignore
Selected PLMN Identity	O		9.2.x.1		YES	ignore

Condition	Explanation
IfPS	This IE shall be present if the *CN domain indicator* IE is set to "PS domain".

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

9.1.24   COMMON ID

This message is sent by the CN to inform the RNC about the permanent NAS UE identity for a user. It may include additional information.

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	M		9.2.3.1		YES	ignore
SNA Access Information	O		9.2.3.24		YES	ignore
UESBI-Iu	O		9.2.1.59		YES	ignore
Selected PLMN Identity	O		9.2.x.1		YES	ignore

9.3.3   PDU Definitions

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

Some unaffected parts of 9.3.3

```
-- ****************************************************************
--
-- 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 optional   } |
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                       PRESENCE
mandatory   } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator
    PRESENCE mandatory  } |
    { ID id-SourceRNC-ToTargetRNC-TransparentContainer
                          CRITICALITY reject  TYPE SourceRNC-ToTargetRNC-TransparentContainer
    PRESENCE mandatory  } |
    { ID id-RAB-SetupList-RelocReq      CRITICALITY reject  TYPE RAB-SetupList-RelocReq
    PRESENCE optional   } |
    { ID id-IntegrityProtectionInformation    CRITICALITY ignore   TYPE
IntegrityProtectionInformation     PRESENCE optional    } |
    { 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,
    rAB-Parameters               RAB-Parameters,
    dataVolumeReportingIndication           DataVolumeReportingIndication   OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    pDP-TypeInformation          PDP-TypeInformation    OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "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 ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {ID id-Alt-RAB-Parameters   CRITICALITY ignore     EXTENSION Alt-RAB-Parameters        PRESENCE
optional} |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-BSC-Container                  CRITICALITY ignore  EXTENSION GERAN-BSC-Container
        PRESENCE optional    },
    ...
}

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

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

RelocationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID              CRITICALITY reject     EXTENSION GlobalCN-ID
    PRESENCE optional} |
-- Extension for Release 5 to enable shared networks in connected mode --
    { ID id-SNA-Access-Information  CRITICALITY ignore     EXTENSION SNA-Access-Information
    PRESENCE optional} |
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE
handling --
    { ID id-UESBI-Iu   CRITICALITY ignore     EXTENSION UESBI-Iu  PRESENCE optional}|
-- Extension for Release 6 to convey the selected PLMN id in network sharing mobility scenarios --
    { ID id-SelectedPLMN-ID     CRITICALITY ignore  EXTENSION PLMNidentity      PRESENCE optional
    }
,
    ...
}

-- *************************************************************
--
-- 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 optional    } |
    { 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 optional    } |
    { 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,
    iuTransportAssociation             IuTransportAssociation  OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { {RAB-SetupItem-RelocReqAck-ExtIEs}
}           OPTIONAL,
    ...
}

RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {ID id-Ass-RAB-Parameters   CRITICALITY ignore      EXTENSION Ass-RAB-Parameters        PRESENCE
optional      } |
-- Extension for Release 5 to allow transfer of a second pair of TLA and association --
    {ID id-TransportLayerAddress    CRITICALITY ignore  EXTENSION TransportLayerAddress PRESENCE
optional} |
    {ID id-IuTransportAssociation   CRITICALITY ignore  EXTENSION IuTransportAssociation    PRESENCE
optional},
    ...
}

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 ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    {ID id-NewBSS-To-OldBSS-Information    CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-
Information     PRESENCE optional      },
    ...
}

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

RelocationFailure ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container        { {RelocationFailureIEs} },
    protocolExtensions     ProtocolExtensionContainer { {RelocationFailureExtensions} }
    OPTIONAL,
    ...
}

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

RelocationFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-NewBSS-To-OldBSS-Information        CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-
Information     PRESENCE optional   } |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark                CRITICALITY ignore  EXTENSION GERAN-Classmark
    PRESENCE optional   },
```

```
    ...
}
```

<div style="text-align: center; border: 1px solid black;">Some unaffected parts of 9.3.3</div>

```
-- *************************************************************
--
-- COMMON ID ELEMENTARY PROCEDURE
--
-- *************************************************************

-- *************************************************************
--
-- Common ID
--
-- *************************************************************

CommonID ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { {CommonID-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {CommonIDExtensions} }
    OPTIONAL,
    ...
}

CommonID-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID         CRITICALITY ignore  TYPE PermanentNAS-UE-ID
    PRESENCE mandatory  },
    ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable shared networks in connected mode --
    { ID id-SNA-Access-Information     CRITICALITY ignore  EXTENSION   SNA-Access-Information
    PRESENCE optional       } |
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE
handling --
    { ID id-UESBI-Iu    CRITICALITY ignore      EXTENSION UESBI-Iu  PRESENCE optional}|
-- Extension for Release 6 to indicate the selected plmn in GWCN configuration for network sharing
non-supporting UEs --
    { ID id-SelectedPLMN-ID    CRITICALITY ignore  EXTENSION PLMNidentity     PRESENCE optional
    },

    ...
}
```