3GPP TSG CT Plenary Meeting #28 **CP-050098**
1st – 3rd June 2005 Quebec, Canada.

Source: TSG CT WG4

Title: Corrections on Work Item small Technical Enhancements and Improvements on SCUDIF

Agenda item: 9.24

Document for: APPROVAL

Doc-2nd-Level	Spec	CR #	Rev	Rel	Tdoc Title	CAT	C_Version
C4-050855	29.010	111	2	Rel-6	Full RANAP support of network initiated SCUDIF	F	6.5.0
C4-050623	29.002	751	1	Rel-6	Full RANAP support of network initiated SCUDIF	F	6.9.0

3GPP TSG-CT WG4 Meeting #27 **C4-050623**
Cancun, MEXICO. 25th to 29th April 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.002** **CR** **751** ⌘ **rev** **1** ⌘ Current version: **6.9.0** ⌘

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

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

Title:	⌘	Full RANAP support of network initiated SCUDIF
Source:	⌘	Nokia
Work item code:	⌘	TEI6
Date:	⌘	07/04/2005
Category:	⌘	**F**
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: ⌘ CT3 and RAN3 have specified the solution for network-initiated service change for SCUDIF. For that solution to be complete changes are needed also to the MAP E-interface for the handover cases when BSSAP is used as a network access protocol between MSCs.

Following functionality is needed to be supported in the E-interface:

- Non-anchor MSC needs to be able to generate the RAB parameters for the alternative radio access bearer to be submitted to the RNC. This is achieved by including a new parameter Alternative Channel Type to the MAP Prepare Handover and Forward Access Signalling services.
- When RNC has detected suitable conditions for the service change the non-anchor MSC needs to be able to inform this to the anchor MSC. This is achieved by including a new parameter Alternative RAB Configuration Request to the MAP Process Access Signalling service. Because there is no appropriate BSSAP message that could be sent in this situation it is added to the MAP protocol a possibility to send this parameter without an access network protocol (BSSAP) message.

Summary of change: ⌘ New parameters Alternative Channel Type and Alternative RAB Configuration Request has been added to the MAP protocol. Also a mechanism to allow sending an empty AN-APDU has been added.

Consequences if not approved: ⌘ The network-initiated service change for SCUDIF functionality would be incomplete.

Clauses affected:	⌘	7.6.6, 7.6.9.1, 8.4.1, 8.4.3, 8.4.4, 17.7.1, 17.7.8				
Other specs affected:	⌘	**Y**	**N**		⌘	23.009 CR 104, 29.010 CR 111
		X		Other core specifications		
			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.

7.6.6 Radio parameters

7.6.6.1 - 7.6.6.3 Void

7.6.6.4 GERAN Classmark

This information element is sent from one MSC to the other MSC in the signalling for inter MSC handover. It is used to convey information related to cell capabilities, as defined in 3GPP TS 48.008.

7.6.6.5 BSSMAP Service Handover

This parameter refers to the Service Handover information element defined in 3GPP TS 48.008

7.6.6.5A BSSMAP Service Handover List

This parameter refers to the list of Service Handover information elements defined in 3GPP TS 48.008. This parameter shall be used when there are multiple bearers and at least one of the bearers has an associated BSSMAP Service Handover parameter.

7.6.6.6 RANAP Service Handover

This parameter refers to the Service Handover information element defined in 3GPP TS 25.413.

7.6.6.7 HO-Number Not Required

This parameter indicates that no handover or relocation number allocation is necessary.

7.6.6.8 Integrity Protection Information

This parameter refers to the Integrity Protection Information element defined in 3GPP TS 25.413.

7.6.6.9 Encryption Information

This parameter refers to the Encryption Information element defined in 3GPP TS 25.413.

7.6.6.10 Radio Resource Information

This parameter refers to the Channel Type information element defined in 3GPP TS 48.008 [49].

7.6.6.10A Radio Resource List

This parameter refers to list of RAB-id's and their associated Channel Type information elements defined in 3GPP TS 48.008. This parameter shall be used when there are multiple bearers and at least one of the bearers has an associated Radio Resource Information parameter.

7.6.6.10B Chosen Radio Resource Information

This parameter refers to the Chosen Channel and Speech Version information elements defined in 3GPP TS 48.008.

7.6.6.11 Key Status

This parameter refers to the Key Status element defined in 3GPP TS 25.413.

7.6.6.12 Selected UMTS Algorithms

This parameters identifies the UMTS integrity and optionally encryption algorithms selected by MSC-B. Coding of this parameter is defined in 3GPP TS 25.413.

7.6.6.13 Allowed GSM Algorithms

This parameters identifies the allowed GSM algorithms in MSC-B. Coding of this parameter is defined in 3GPP TS 48.008.

7.6.6.14 Allowed UMTS Algorithms

This parameters identifies the allowed UMTS algorithms in MSC-B. Coding of this parameter is defined in 3GPP TS 25.413.

7.6.6.15 Selected GSM Algorithm

This parameter identifies the GSM algorithm selected by GSM BSC controlled by MSC-B. Coding of this parameter is defined in 3GPP TS 48.008.

7.6.6.16 Iu-Currently Used Codec

This parameter indicates the codec used at the Iu interface before handover.

7.6.6.17 Iu-Supported Codecs List

This parameter indicates the codecs supported by the UE and by MSC-A and the associated modes in priority order (the first entry being the highest priority codec). MSC-B uses this information to select the associated transcoder resources.

7.6.6.17A Iu-Available Codecs List

This parameter indicates the codecs available at the Iu interface in MSC-B and the associated modes. MSC-A uses this information to decide whether a change to a different codec at the Iu interface is possible.

7.6.6.18 Iu-Selected Codec

When sent by MSC-B, this parameter indicates the codec selected by MSC-B for the Iu interface. When sent by MSC-A, this parameter indicates the codec to be used by MSC-B at the Iu interface.

7.6.6.19 RAB Configuration Indicator

This parameter indicates by its presence that MSC-A (or MSC-B in case of subsequent handover) has generated the RAB parameters according to the preferred codec (first entry in the Available Codecs List).

7.6.6.20 UESBI-Iu

This parameter refers to the UESBI-Iu (UE Specific Behaviour Information over the Iu interface) information element defined in 3GPP TS 25.413.

7.6.6.xx Alternative Channel Type

This parameter refers to the Channel Type information element defined in 3GPP TS 48.008 [49] for the alternative radio access bearer. This parameter is used for SCUDIF calls (see 3GPP TS 23.172 [126]).

7.6.6.xx Alternative RAB Configuration Request

This parameter refers to the Alternative RAB Configuration Request information element defined in 3GPP TS 25.413.

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

7.6.9.1 AN-apdu

This parameter includes one or two concatenated complete 3GPP TS 25.413 or 3GPP TS 48.006 [48] messages, as described in 3GPP TS 23.009 and 3GPP TS 29.010. The access network protocol ID indicates that the message or messages are according to either 3GPP TS 48.006 [48] or 3GPP TS 25.413. For the coding of the messages see 3GPP TS 25.413, 3GPP TS 48.006 [48] and 3GPP TS 48.008 [49].

This parameter may be also sent without an access network protocol message if the receiving entity has indicated prior that it supports the parameter receiving without an access network protocol message.

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

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Allowed GSM Algorithms	C	C(=)		
Allowed UMTS Algorithms	C	C(=)		
Radio Resource List	C	C(=)		
RAB ID	C	C(=)		
GERAN Classmark	C	C(=)		
BSSMAP Service Handover	C	C(=)		
BSSMAP Service Handover List	C	C(=)		
RANAP Service Handover	C	C(=)		
Iu-Currently Used Codec	C	C(=)		
Iu-Supported Codecs List	C	C(=)		
RAB Configuration Indicator	C	C(=)		
ASCI Call Reference	C	C(=)		
UESBI-Iu	C	C(=)		
IMEISV	C	C(=)		
Empty Signal Info Allowed	C	C(=)	C	C(=)
Alternative Channel Type	C	C(=)		
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)

Selected UMTS Algorithms			C	C(=)
Chosen Radio Resource Information			C	C(=)
Iu-Selected Codec			C	C(=)
Iu-Available Codecs List			C	C(=)
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see clause 7.6.1.

Target Cell Id

For definition of this parameter see clause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3GPP TS 23.009.

Target RNC Id

For definition of this parameter see clause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3GPP TS 23.009.

HO-Number Not Required

For definition of this parameter see clause 7.6.6.

IMSI

For definition of this parameter see clause 7.6.2. This UMTS parameter shall be included if:

- available and
- if the access network protocol is BSSAP and
- there is an indication that the MS also supports UMTS.

Integrity Protection Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the access network protocol is BSSAP.

Encryption Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the access network protocol is BSSAP.

Radio Resource Information

For definition of this parameter see clause 7.6.6. This GSM parameter shall be included if the access network protocol is RANAP and there is an indication that the UE also supports GSM. If the parameter Radio Resource List is sent , the parameter Radio Resource Information shall not be sent.

AN-APDU

For definition of this parameter see clause 7.6.9.

Allowed GSM Algorithms

For definition of this parameter see clause 7.6.6. This parameters includes allowed GSM algorithms. This GSM parameter shall be included if:

- the service is a part of the Inter-MSC SRNS Relocation procedure and

- Ciphering or Security Mode Setting procedure has been performed.and
- there is an indication that the UE also supports GSM.

Allowed UMTS Algorithms

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if all of the following conditions apply:

- access network protocol is BSSAP and
- Integrity Protection Information and Encryption Information are not available and

Ciphering or Security Mode Setting procedure has been performed.

Radio Resource List

For definition of this parameter see clause 7.6.6. This parameter shall be included if the access network protocol is RANAP and there is an indication that the UE also supports GSM. This parameter shall be sent when MSC-A requests multiple bearers to MSC-B. If the parameter Radio Resource Information is sent , the parameter Radio Resource List shall not be sent.

RAB ID

For definition of this parameter see subclause 7.6.2. This parameter shall be included when MSC-A supports multiple bearers and access network protocol is BSSAP and the RAB ID has a value other than 1.

GERAN Classmark

For definition of this parameter see subclause 7.6.6 This parameter shall be included if available.

BSSMAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the access network protocol is RANAP. If the parameter BSSMAP Service Handover List is sent, the parameter BSSMAP Service Handover shall not be sent.

BSSMAP Service Handover List

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the access network protocol is RANAP. This parameter shall be sent when MSC-A requests multiple bearers to MSC-B. If the parameter BSSMAP Service Handover is sent, the parameter BSSMAP Service Handover List shall not be sent.

RANAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the access network protocol is BSSAP.

Iu-Currently Used Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the handover is requested for a speech bearer and the MS is in UMTS or GERAN Iu-mode access. This parameter shall not be included if the Iu-Supported Codecs List is not included.

Iu-Supported Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included by MSC-A, if the handover is requested for a speech bearer.

RAB Configuration Indicator

For definition of this parameter see subclause 7.6.6. This parameter may be included if the handover is requested for a speech bearer and MSC-A knows by means of configuration information that MSC-B supports the use of the Iu-Supported Codecs List parameter. This parameter shall not be included if the Iu-Supported Codecs List is not included.

ASCI Call Reference

This parameter contains either the broadcast call reference or group call reference. It shall be included if a subscriber is undergoing handover during a VGCS or VBS call, where MSC-B already has a Bearer established, so that MSC-B can determine the Group or Broadcast Call to which it shall attach the subscriber, see 3GPP TS 48.008 [49].

UESBI-Iu

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the access network protocol is BSSAP.

IMEISV

For definition of the parameter see clause 7.6.2. This parameter is used for Management based Trace Activation (see 3GPP TS 32.422) and shall be present, if available.

Empty Signal Info Allowed

This parameter may be present if the network entity supports receiving of an AN-APDU parameter with an empty access network PDU. It shall be present in the Prepare Handover request message for a SCUDIF call if the access network protocol is BSSAP.

Alternative Channel Type

For definition of this parameter see clause 7.6.6 It shall be present for a SCUDIF call if the access network protocol is BSSAP.

Handover Number

For definition of this parameter see clause 7.6.2. This parameter shall be returned at handover, unless the parameter HO-NumberNotRequired is sent. If the parameter Handover Number is returned, the parameter Relocation Number List shall not be returned.

Relocation Number List

For definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation, unless the parameter HO-NumberNotRequired is sent. If the parameter Relocation Number List is returned, the parameter Handover Number shall not be returned.

Multicall Bearer Information

For a definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation in the case that MSC-B supports multiple bearers.

Multiple Bearer Requested

For a definition of this parameter see clause 7.6.2. This parameter shall be sent when MSC-A requests multiple bearers to MSC-B.

Multiple Bearer Not Supported

For a definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation when MSC-B receives Multiple Bearer Requested parameter and MSC-B does not support multiple bearers.

Selected UMTS Algorithms

For definition of this parameter see clause 7.6.6. This parameters includes the UMTS integrity and optionally encryption algorithms selected by RNC under the control of MSC-B. This UMTS parameter shall be included if the service is a part of the inter MSC inter system handover from GSM to UMTS.

Chosen Radio Resource Information

For definition of this parameter see clause 7.6.6. This parameter shall be returned at relocation if the encapsulated PDU is RANAP RAB Assignment Response and MS is in GSM access.

Iu-Selected Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if an Iu-Supported Codecs List was received in the service request and MSC-B supports the selection of codec based on the Iu-Supported Codecs List, even if the Iu-Selected Codec is equal to the Iu-Currently Used Codec received in the service request. This parameter shall not be included if the Iu-Supported Codecs List was not received in the service request.

Iu-Available Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included by an MSC-B supporting TrFO, if the Iu-Supported Codecs List was included by MSC-A and the target radio access is UMTS or GERAN Iu-mode.

User error

For definition of this parameter see clause 7.6.1. The following errors defined in clause 7.6.1 may be used, depending on the nature of the fault:

- No handover number available.
- Target cell outside group call area;
- System failure.
- Unexpected data value.
- Data Missing.

Provider error

See definition of provider errors in clause 7.6.1.

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

8.4.3 MAP_PROCESS_ACCESS_SIGNALLING service

8.4.3.1 Definition

This service is used between MSC-B and MSC-A (E-interface) to pass information received on the A-interface or Iu-interface in MSC-B to MSC-A.

The MAP_PROCESS_ACCESS_SIGNALLING service is a non-confirmed service using the primitives from table 8.4/3.

8.4.3.2 Service primitives

Table 8.4/3: MAP_PROCESS_ACCESS_SIGNALLING

Parameter name	Request	Indication
Invoke Id	M	M(=)
AN-APDU	M	M(=)
Selected GSM Algorithm	C	C(=)
Selected UMTS Algorithms	C	C(=)
Chosen Radio Resource Information	C	C(=)
Selected RAB id	C	C(=)
Iu-Selected Codec	C	C(=)
Iu-Available Codecs List	C	C(=)
Alternative RAB Configuration Request	C	C(=)

8.4.3.3 Parameter use

Invoke Id

For definition of this parameter see clause 7.6.1.

AN-APDU

For definition of this parameter see clause 7.6.9.

Selected GSM algorithm

For definition of this parameter see clause 7.6.6. This parameter shall be present if the encapsulated PDU is Security Mode Complete and MS is in GSM access.

Selected UMTS Algorithms

For definition of this parameter see clause 7.6.6. This parameters includes the UMTS integrity and optionally encryption algorithms selected by RNC under the control of MSC-B. This UMTS parameter shall be included if the encapsulated PDU is BSSMAP Cipher Mode Complete and the MS is in UMTS, or an interystem handover to UMTS is performed in MSC-B, or in the case of intra MSC-B intra UMTS relocation.

Chosen Radio Resource Information

For definition of this parameter see clause 7.6.6. This parameter shall be sent if the encapsulated PDU is RANAP RAB Assignment Response and MS is in GSM access.

Selected RAB ID

The selected radio access bearer that was kept at subsequent intra-MSC handover from UMTS to GSM after multiple bearers were used.

Iu-Selected Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included

- if MSC-B changes the selected codec;
- if intersystem handover to UMTS or GERAN Iu-mode is performed in MSC-B; or
- if MSC-B received a Forward Access Signalling service request including an Iu-Supported Codecs List and the MS is in UMTS or GERAN Iu-mode access.

This parameter shall not be included if the Iu-Supported Codecs List was not received either in the Prepare Handover service request or in the Forward Access Signalling service request.

Iu-Available Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included by an MSC-B supporting TrFO

- if the Iu-Available Codecs List has changed in MSC-B;
- if intersystem handover to UMTS or GERAN Iu-mode is performed in MSC-B; or
- if MSC-B received a Forward Access Signalling service request including an Iu-Supported Codecs List and the MS is in UMTS or GERAN Iu-mode access.

Alternative RAB Configuration Request

For definition of this parameter see clause 7.6.6. Indicates the possibility for CN to perform a network-initiated service change for SCUDIF, as described in 3GPP TS 23.172. It may be present only if the access network protocol is BSSAP.

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

8.4.4 MAP_FORWARD_ACCESS_SIGNALLING service

8.4.4.1 Definition

This service is used between MSC-A and MSC-B (E-interface) to pass information to be forwarded to the A-interface or Iu-interface of MSC-B.

The MAP_FORWARD_ACCESS_SIGNALLING service is a non-confirmed service using the primitives from table 8.4/4.

8.4.4.2 Service primitives

Table 8.4/4: MAP_FORWARD_ACCESS_SIGNALLING

Parameter name	Request	Indication
Invoke Id	M	M(=)
Integrity Protection Information	C	C(=)
Encryption Information	C	C(=)
Key Status	C	C(=)
AN-APDU	M	M(=)
Allowed GSM Algorithms	C	C(=)
Allowed UMTS Algorithms	C	C(=)
Radio Resource Information	C	C(=)
Radio Resource List	C	C(=)
BSSMAP Service Handover	C	C(=)
BSSMAP Service Handover List	C	C(=)
RANAP Service Handover	C	C(=)
Iu-Currently Used Codec	C	C(=)
Iu-Supported Codecs List	C	C(=)
RAB Configuration Indicator	C	C(=)
Iu-Selected Codec	C	C(=)
Alternative Channel Type	C	C(=)

8.4.4.3 Parameter use

For the definition and use of all parameters and errors, see clause 7.6.1.

Invoke Id

For definition of this parameter see clause 7.6.1.

Integrity Protection Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

Encryption Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

Key Status

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

AN-APDU

For definition of this parameter see clause 7.6.9.

Allowed GSM Algorithms

This parameters includes allowed GSM algorithms. This GSM parameter shall be included if the encapsulated PDU is RANAP Security Mode Command and there is an indication that the UE also supports GSM.

Allowed UMTS Algorithms

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if Integrity Protection Information and Encryption Information are not available and the encapsulated PDU is BSSMAP Cipher Mode Command.

Radio Resource Information

For definition of this parameter see clause 7.6.6. This parameter shall be sent if the encapsulated PDU is RANAP RAB Assignment Request. If the parameter Radio Resource List is sent, the parameter Radio Resource Information shall not be sent.

Radio Resource List

For definition of this parameter see clause 7.6.6. This parameter shall be sent if the encapsulated PDU is RANAP RAB Assignment Request and MSC-A requests modification of multiple bearers. If the parameter Radio Resource Information is sent, the parameter Radio Resource List shall not be sent.

BSSMAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the encapsulated PDU is RANAP RAB Assignment Request. If the parameter BSSMAP Service Handover List is sent, the parameter BSSMAP Service Handover shall not be sent.

BSSMAP Service Handover List

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the encapsulated PDU is RANAP RAB Assignment Request and MSC-A requests modification of multiple bearers. If the parameter BSSMAP Service Handover is sent, the parameter BSSMAP Service Handover List shall not be sent.

RANAP Service Handover

For definition of this parameter see clause 7.6.6.. It shall be present if it is available and the encapsulated PDU is BSSMAP Assignment Request.

Iu-Currently Used Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the encapsulated PDU is a RANAP RAB Assignment Request or BSSMAP Assignment Request for a speech bearer and the MS is in UMTS or GERAN Iu-mode access. This parameter shall not be included if the Iu-Supported Codecs List is not included.

Iu-Supported Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the encapsulated PDU is a RANAP RAB Assignment Request or BSSMAP Assignment Request and

- a new bearer is allocated for speech;
- an existing bearer is modified from data to speech; or
- for an existing speech bearer the order of priority in the Iu-Supported Codecs List needs to be modified.

This parameter shall not be included if the Iu-Selected Codec is included.

RAB Configuration Indicator

For definition of this parameter see subclause 7.6.6. This parameter may be included if the encapsulated PDU is a RANAP RAB Assignment Request for a speech bearer, and MSC-A knows by means of configuration information that MSC-B supports the use of the Iu-Supported Codecs List parameter. This parameter shall not be included if the Iu-Supported Codecs List is not included.

Iu-Selected Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if

- the encapsulated PDU is a RANAP RAB Assignment Request or BSSMAP Assignment Request for an existing speech bearer;
- the MS is in UMTS or GERAN Iu-mode access; and
- an Iu-Available Codecs List was received by MSC-A for this speech bearer before, either in the Prepare Handover service response or in the Process Access Signalling service request.

This parameter shall not be included if the Iu-Supported Codecs List is included.

Alternative Channel Type

For definition of this parameter see clause 7.6.6. This parameter shall be present for a SCUDIF call if the encapsulated PDU is BSSMAP Assignment Request.

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

17.7.1 Mobile Service data types

```
MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   -- location registration types
   UpdateLocationArg,
   UpdateLocationRes,
   CancelLocationArg,
   CancelLocationRes,
   PurgeMS-Arg,
   PurgeMS-Res,
   SendIdentificationArg,
   SendIdentificationRes,
   UpdateGprsLocationArg,
   UpdateGprsLocationRes,
   IST-SupportIndicator,
   SupportedLCS-CapabilitySets,

   -- gprs location registration types
   GSN-Address,

   -- handover types
   ForwardAccessSignalling-Arg,
   PrepareHO-Arg,
   PrepareHO-Res,
   PrepareSubsequentHO-Arg,
   PrepareSubsequentHO-Res,
   ProcessAccessSignalling-Arg,
   SendEndSignal-Arg,
   SendEndSignal-Res,

   -- authentication management types
   SendAuthenticationInfoArg,
   SendAuthenticationInfoRes,
   AuthenticationFailureReportArg,
   AuthenticationFailureReportRes,

   -- security management types
   Kc,
```

```
    -- equipment management types
    CheckIMEI-Arg,
    CheckIMEI-Res,

    -- subscriber management types
    InsertSubscriberDataArg,
    InsertSubscriberDataRes,
    LSAIdentity,
    DeleteSubscriberDataArg,
    DeleteSubscriberDataRes,
    Ext-QoS-Subscribed,
    Ext2-QoS-Subscribed,
    SubscriberData,
    ODB-Data,
    SubscriberStatus,
    ZoneCodeList,
    maxNumOfZoneCodes,
    O-CSI,
    D-CSI,
    O-BcsmCamelTDPCriteriaList,
    T-BCSM-CAMEL-TDP-CriteriaList,
    SS-CSI,
    ServiceKey,
    DefaultCallHandling,
    CamelCapabilityHandling,
    BasicServiceCriteria,
    SupportedCamelPhases,
    OfferedCamel4CSIs,
    OfferedCamel4Functionalities,
    maxNumOfCamelTDPData,
    CUG-Index,
    CUG-Info,
    CUG-Interlock,
    InterCUG-Restrictions,
    IntraCUG-Options,
    NotificationToMSUser,
    QoS-Subscribed,
    IST-AlertTimerValue,
    T-CSI,
    T-BcsmTriggerDetectionPoint,
    APN,

    -- fault recovery types
    ResetArg,
    RestoreDataArg,
    RestoreDataRes,

-- provide subscriber info types
    GeographicalInformation,
    MS-Classmark2,
    GPRSMSClass,

    -- subscriber information enquiry types
    ProvideSubscriberInfoArg,
    ProvideSubscriberInfoRes,
    SubscriberInfo,
    LocationInformation,
    LocationInformationGPRS,
    RAIdentity,
    SubscriberState,
    GPRSChargingID,
    MNPInfoRes,
    RouteingNumber,

    -- any time information enquiry types
    AnyTimeInterrogationArg,
    AnyTimeInterrogationRes,

    -- any time information handling types
    AnyTimeSubscriptionInterrogationArg,
    AnyTimeSubscriptionInterrogationRes,
    AnyTimeModificationArg,
    AnyTimeModificationRes,

    -- subscriber data modification notification types
    NoteSubscriberDataModifiedArg,
    NoteSubscriberDataModifiedRes,
```

```
   -- gprs location information retrieval types
   SendRoutingInfoForGprsArg,
   SendRoutingInfoForGprsRes,

   -- failure reporting types
   FailureReportArg,
   FailureReportRes,

   -- gprs notification types
   NoteMsPresentForGprsArg,
   NoteMsPresentForGprsRes,

   -- Mobility Management types
   NoteMM-EventArg,
   NoteMM-EventRes,
   NumberPortabilityStatus

;

IMPORTS
   maxNumOfSS,
   SS-SubscriptionOption,
   SS-List,
   SS-ForBS-Code,
   Password
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) version9 (9)}

   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version9 (9)}

   Ext-BearerServiceCode
FROM MAP-BS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-BS-Code (20) version9 (9)}

   Ext-TeleserviceCode
FROM MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) version9 (9)}

   AddressString,
   ISDN-AddressString,
   ISDN-SubaddressString,
   FTN-AddressString,
   AccessNetworkSignalInfo,
   IMSI,
   IMEI,
   TMSI,
   HLR-List,
   LMSI,
   Identity,
   GlobalCellId,
   CellGlobalIdOrServiceAreaIdOrLAI,
   Ext-BasicServiceCode,
   NAEA-PreferredCI,
   EMLPP-Info,
   MC-SS-Info,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   Ext-SS-Status,
   LCSServiceTypeID,
   ASCI-CallReference,
   TBCD-STRING,
   LAIFixedLength
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version9 (9)}
```

```
   AbsentSubscriberDiagnosticSM
FROM MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) version9 (9)}

;

-- location registration types

UpdateLocationArg ::= SEQUENCE {
     imsi                              IMSI,
     msc-Number                        [1] ISDN-AddressString,
     vlr-Number                        ISDN-AddressString,
     lmsi                              [10] LMSI                          OPTIONAL,
     extensionContainer                ExtensionContainer                 OPTIONAL,
     ... ,
     vlr-Capability                    [6] VLR-Capability                 OPTIONAL,
     informPreviousNetworkEntity       [11] NULL                          OPTIONAL,
     cs-LCS-NotSupportedByUE           [12] NULL                          OPTIONAL,
     v-gmlc-Address                    [2]  GSN-Address                   OPTIONAL,
     add-info                          [13] ADD-Info                      OPTIONAL }

VLR-Capability ::= SEQUENCE{
     supportedCamelPhases              [0] SupportedCamelPhases           OPTIONAL,
     extensionContainer                ExtensionContainer                 OPTIONAL,
     ... ,
     solsaSupportIndicator             [2] NULL                           OPTIONAL,
     istSupportIndicator               [1] IST-SupportIndicator           OPTIONAL,
     superChargerSupportedInServingNetworkEntity   [3] SuperChargerInfo   OPTIONAL,
     longFTN-Supported                 [4]  NULL                          OPTIONAL,
     supportedLCS-CapabilitySets       [5]  SupportedLCS-CapabilitySets   OPTIONAL,
     offeredCamel4CSIs                 [6] OfferedCamel4CSIs              OPTIONAL }

SuperChargerInfo ::= CHOICE {
     sendSubscriberData                [0] NULL,
     subscriberDataStored              [1] AgeIndicator }

AgeIndicator ::= OCTET STRING (SIZE (1..6))
     -- The internal structure of this parameter is implementation specific.

IST-SupportIndicator ::=  ENUMERATED {
     basicISTSupported                 (0),
     istCommandSupported               (1),
     ...}
-- exception handling:
-- reception of values > 1 shall be mapped to ' istCommandSupported '

SupportedLCS-CapabilitySets ::= BIT STRING {
     lcsCapabilitySet1 (0),
     lcsCapabilitySet2 (1),
     lcsCapabilitySet3 (2),
     lcsCapabilitySet4 (3) } (SIZE (2..16))
-- Core network signalling capability set1 indicates LCS Release98 or Release99 version.
-- Core network signalling capability set2 indicates LCS Release4.
-- Core network signalling capability set3 indicates LCS Release5.
-- Core network signalling capability set4 indicates LCS Release6 or later version.
-- A node shall mark in the BIT STRING all LCS capability sets it supports.
-- If no bit is set then the sending node does not support LCS.
-- If the parameter is not sent by an VLR then the VLR may support at most capability set1.
-- If the parameter is not sent by an SGSN then no support for LCS is assumed.
-- An SGSN is not allowed to indicate support of capability set1.
-- Other bits than listed above shall be discarded.

UpdateLocationRes ::= SEQUENCE {
     hlr-Number                        ISDN-AddressString,
     extensionContainer                ExtensionContainer                 OPTIONAL,
     ...,
     add-Capability                    NULL                               OPTIONAL }

ADD-Info ::= SEQUENCE {
     imeisv                            [0] IMEI,
     skipSubscriberDataUpdate          [1] NULL                           OPTIONAL,
     ...}
```

```
CancelLocationArg ::= [3] SEQUENCE {
    identity                        Identity,
    cancellationType                CancellationType                OPTIONAL,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
CancellationType ::= ENUMERATED {
    updateProcedure                 (0),
    subscriptionWithdraw            (1),
    ...}
    -- The HLR shall not send values other than listed above
```

```
CancelLocationRes ::= SEQUENCE {
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
PurgeMS-Arg ::= [3] SEQUENCE {
    imsi                            IMSI,
    vlr-Number                      [0] ISDN-AddressString          OPTIONAL,
    sgsn-Number                     [1]  ISDN-AddressString         OPTIONAL,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
PurgeMS-Res ::= SEQUENCE {
    freezeTMSI                      [0]  NULL                       OPTIONAL,
    freezeP-TMSI                    [1]  NULL                       OPTIONAL,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
SendIdentificationArg ::= SEQUENCE {
    tmsi                            TMSI,
    numberOfRequestedVectors        NumberOfRequestedVectors        OPTIONAL,
    -- within a dialogue numberOfRequestedVectors shall be present in
    -- the first service request and shall not be present in subsequent service requests.
    -- If received in a subsequent service request it shall be discarded.
    segmentationProhibited          NULL                            OPTIONAL,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...,
    msc-Number                      ISDN-AddressString              OPTIONAL,
    previous-LAI                    [0] LAIFixedLength              OPTIONAL,
    hopCounter                      [1] HopCounter                  OPTIONAL }
```

```
HopCounter ::= INTEGER (0..3)
```

```
SendIdentificationRes ::= [3] SEQUENCE {
    imsi                            IMSI                            OPTIONAL,
    -- IMSI shall be present in the first (or only) service response of a dialogue.
    -- If multiple service requests are present in a dialogue then IMSI
    -- shall not be present in any service response other than the first one.
    authenticationSetList           AuthenticationSetList           OPTIONAL,
    currentSecurityContext          [2]CurrentSecurityContext       OPTIONAL,
    extensionContainer              [3] ExtensionContainer          OPTIONAL,
    ...}
```

```
-- authentication management types
```

```
AuthenticationSetList ::= CHOICE {
    tripletList                     [0] TripletList,
    quintupletList                  [1] QuintupletList }
```

```
TripletList ::= SEQUENCE SIZE (1..5) OF
                                    AuthenticationTriplet
```

```
QuintupletList ::= SEQUENCE SIZE (1..5) OF
                                    AuthenticationQuintuplet
```

```
AuthenticationTriplet ::= SEQUENCE {
    rand                            RAND,
    sres                            SRES,
    kc                              Kc,
    ...}
```

```
AuthenticationQuintuplet ::= SEQUENCE {
     rand                                RAND,
     xres                                XRES,
     ck                                  CK,
     ik                                  IK,
     autn                                AUTN,
     ...}
```

```
CurrentSecurityContext ::= CHOICE {
     gsm-SecurityContextData             [0] GSM-SecurityContextData,
     umts-SecurityContextData            [1] UMTS-SecurityContextData }
```

```
GSM-SecurityContextData ::= SEQUENCE {
     kc                                  Kc,
     cksn                                Cksn,
     ... }
```

```
UMTS-SecurityContextData ::= SEQUENCE {
     ck                                  CK,
     ik                                  IK,
     ksi                                 KSI,
     ... }
```

```
RAND ::= OCTET STRING (SIZE (16))
```

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

```
Kc ::= OCTET STRING (SIZE (8))
```

```
XRES ::= OCTET STRING (SIZE (4..16))
```

```
CK ::= OCTET STRING (SIZE (16))
```

```
IK ::= OCTET STRING (SIZE (16))
```

```
AUTN ::= OCTET STRING (SIZE (16))
```

```
AUTS ::= OCTET STRING (SIZE (14))
```

```
Cksn ::= OCTET STRING (SIZE (1))
     -- The internal structure is defined in 3GPP TS 24.008
```

```
KSI ::= OCTET STRING (SIZE (1))
     -- The internal structure is defined in 3GPP TS 24.008
```

```
AuthenticationFailureReportArg ::= SEQUENCE {
     imsi                                IMSI,
     failureCause                        FailureCause,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ... ,
     re-attempt                          BOOLEAN                           OPTIONAL,
     accessType                          AccessType                        OPTIONAL,
     rand                                RAND                              OPTIONAL,
     vlr-Number                          [0] ISDN-AddressString            OPTIONAL,
     sgsn-Number                         [1] ISDN-AddressString            OPTIONAL }
```

```
AccessType ::= ENUMERATED {
     call (0),
     emergencyCall (1),
     locationUpdating (2),
     supplementaryService (3),
     shortMessage (4),
     gprsAttach (5),
     routingAreaUpdating (6),
     serviceRequest (7),
     pdpContextActivation (8),
     pdpContextDeactivation (9),
     ...,
     gprsDetach (10)}
     -- exception handling:
     -- received values greater than 10 shall be ignored.
```

```
AuthenticationFailureReportRes ::= SEQUENCE {
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
FailureCause ::= ENUMERATED {
    wrongUserResponse  (0),
    wrongNetworkSignature  (1)}
```

-- gprs location registration types

```
UpdateGprsLocationArg ::= SEQUENCE {
    imsi                              IMSI,
    sgsn-Number                       ISDN-AddressString,
    sgsn-Address                      GSN-Address,
    extensionContainer                ExtensionContainer                OPTIONAL,
    ... ,
    sgsn-Capability                   [0] SGSN-Capability               OPTIONAL,
    informPreviousNetworkEntity       [1]  NULL                         OPTIONAL,
    ps-LCS-NotSupportedByUE           [2]  NULL                         OPTIONAL,
    v-gmlc-Address                    [3]  GSN-Address                  OPTIONAL,
    add-info                          [4]  ADD-Info                     OPTIONAL }
```

```
SGSN-Capability ::= SEQUENCE{
    solsaSupportIndicator             NULL                              OPTIONAL,
    extensionContainer                [1] ExtensionContainer            OPTIONAL,
    ... ,
    superChargerSupportedInServingNetworkEntity   [2] SuperChargerInfo  OPTIONAL ,
    gprsEnhancementsSupportIndicator  [3] NULL                          OPTIONAL,
    supportedCamelPhases              [4] SupportedCamelPhases          OPTIONAL,
    supportedLCS-CapabilitySets       [5]  SupportedLCS-CapabilitySets  OPTIONAL,
    offeredCamel4CSIs                 [6] OfferedCamel4CSIs             OPTIONAL,
    smsCallBarringSupportIndicator    [7]  NULL                         OPTIONAL }
```

```
GSN-Address ::= OCTET STRING (SIZE (5..17))
    -- Octets are coded according to TS 3GPP TS 23.003 [17]
```

```
UpdateGprsLocationRes ::= SEQUENCE {
    hlr-Number                        ISDN-AddressString,
    extensionContainer                ExtensionContainer                OPTIONAL,
    ...,
    add-Capability                    NULL                              OPTIONAL }
```

-- handover types

```
ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                           AccessNetworkSignalInfo,
    integrityProtectionInfo           [0] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                    [1] EncryptionInformation           OPTIONAL,
    keyStatus                         [2]  KeyStatus                    OPTIONAL,
    allowedGSM-Algorithms             [4]  AllowedGSM-Algorithms        OPTIONAL,
    allowedUMTS-Algorithms            [5]  AllowedUMTS-Algorithms       OPTIONAL,
    radioResourceInformation          [6] RadioResourceInformation      OPTIONAL,
    extensionContainer                [3]  ExtensionContainer           OPTIONAL,
    ...,
    radioResourceList                 [7]  RadioResourceList            OPTIONAL,
    bssmap-ServiceHandover            [9]  BSSMAP-ServiceHandover       OPTIONAL,
    ranap-ServiceHandover             [8]  RANAP-ServiceHandover        OPTIONAL,
    bssmap-ServiceHandoverList        [10] BSSMAP-ServiceHandoverList   OPTIONAL,
    currentlyUsedCodec                [11] Codec                        OPTIONAL,
    iuSupportedCodecsList             [12] SupportedCodecsList          OPTIONAL,
    rab-ConfigurationIndicator        [13] NULL                         OPTIONAL,
    iuSelectedCodec                   [14] Codec                        OPTIONAL,
    alternativeChannelType            [xx] RadioResourceInformation     OPTIONAL }
```

```
AllowedGSM-Algorithms ::= OCTET STRING (SIZE (1))
    -- internal structure is coded as Algorithm identifier octet from
    -- Permitted Algorithms defined in 3GPP TS 48.008
    -- A node shall mark all GSM algorithms that are allowed in MSC-B
```

```
AllowedUMTS-Algorithms ::= SEQUENCE {
    integrityProtectionAlgorithms     [0]  PermittedIntegrityProtectionAlgorithms
    OPTIONAL,
    encryptionAlgorithms              [1]  PermittedEncryptionAlgorithms  OPTIONAL,
    extensionContainer                [2]  ExtensionContainer           OPTIONAL,
    ...}
```

```
PermittedIntegrityProtectionAlgorithms ::=
        OCTET STRING (SIZE (1..maxPermittedIntegrityProtectionAlgorithmsLength))
    -- Octets contain a complete PermittedIntegrityProtectionAlgorithms data type
    -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
    -- mandated by 3GPP TS 25.413.
    -- Padding bits are included, if needed, in the least significant bits of the
    -- last octet of the octet string.
```

```
maxPermittedIntegrityProtectionAlgorithmsLength INTEGER ::= 9
```

```
PermittedEncryptionAlgorithms ::=
        OCTET STRING (SIZE (1..maxPermittedEncryptionAlgorithmsLength))
    -- Octets contain a complete PermittedEncryptionAlgorithms data type
    -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
    -- mandated by 3GPP TS 25.413
    -- Padding bits are included, if needed, in the least significant bits of the
    -- last octet of the octet string.
```

```
maxPermittedEncryptionAlgorithmsLength INTEGER ::= 9
```

```
KeyStatus ::= ENUMERATED {
    old  (0),
    new  (1),
    ...}
    -- exception handling:
    -- received values in range 2-31 shall be treated as "old"
    -- received values greater than 31 shall be treated as "new"
```

```
PrepareHO-Arg ::= [3] SEQUENCE {
    targetCellId                    [0] GlobalCellId                  OPTIONAL,
    ho-NumberNotRequired            NULL                              OPTIONAL,
    targetRNCId                     [1] RNCId                         OPTIONAL,
    an-APDU                         [2] AccessNetworkSignalInfo       OPTIONAL,
    multipleBearerRequested         [3] NULL                          OPTIONAL,
    imsi                            [4] IMSI                          OPTIONAL,
    integrityProtectionInfo         [5] IntegrityProtectionInformation  OPTIONAL,
    encryptionInfo                  [6] EncryptionInformation          OPTIONAL,
    radioResourceInformation        [7] RadioResourceInformation      OPTIONAL,
    allowedGSM-Algorithms           [9]  AllowedGSM-Algorithms        OPTIONAL,
    allowedUMTS-Algorithms          [10] AllowedUMTS-Algorithms       OPTIONAL,
    radioResourceList               [11] RadioResourceList            OPTIONAL,
    extensionContainer              [8] ExtensionContainer            OPTIONAL,
    ... ,
    rab-Id                          [12] RAB-Id                       OPTIONAL,
    bssmap-ServiceHandover          [13] BSSMAP-ServiceHandover       OPTIONAL,
    ranap-ServiceHandover           [14] RANAP-ServiceHandover        OPTIONAL,
    bssmap-ServiceHandoverList      [15] BSSMAP-ServiceHandoverList   OPTIONAL,
    asciCallReference               [20] ASCI-CallReference           OPTIONAL,
    geran-classmark                 [16] GERAN-Classmark              OPTIONAL,
    iuCurrentlyUsedCodec            [17] Codec                        OPTIONAL,
    iuSupportedCodecsList           [18] SupportedCodecsList          OPTIONAL,
    rab-ConfigurationIndicator      [19] NULL                         OPTIONAL,
    uesbi-Iu                        [21] UESBI-Iu                     OPTIONAL,
    imeisv                          [22] IMEI                         OPTIONAL,
    emptySignalInfoAllowed          [xx] NULL                         OPTIONAL,
    alternativeChannelType          [xx] RadioResourceInformation     OPTIONAL   }
```

```
BSSMAP-ServiceHandoverList ::= SEQUENCE SIZE (1.. maxNumOfServiceHandovers) OF
                               BSSMAP-ServiceHandoverInfo
```

```
BSSMAP-ServiceHandoverInfo ::= SEQUENCE {
    bssmap-ServiceHandover          BSSMAP-ServiceHandover,
    rab-Id                          RAB-Id,
    -- RAB Identity is needed to relate the service handovers with the radio access bearers.
    ...}
```

```
maxNumOfServiceHandovers  INTEGER ::= 7
```

```
BSSMAP-ServiceHandover ::= OCTET STRING (SIZE (1))
    -- Octets are coded according the Service Handover information element in
    -- 3GPP TS 48.008.
```

```
RANAP-ServiceHandover ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete Service-Handover data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
RadioResourceList ::= SEQUENCE SIZE (1.. maxNumOfRadioResources) OF
                                        RadioResource
```

```
RadioResource ::= SEQUENCE {
     radioResourceInformation            RadioResourceInformation,
     rab-Id                              RAB-Id,
     -- RAB Identity is needed to relate the radio resources with the radio access bearers.
     ...}
```

```
maxNumOfRadioResources  INTEGER ::= 7
```

```
PrepareHO-Res ::= [3] SEQUENCE {
     handoverNumber                      [0] ISDN-AddressString              OPTIONAL,
     relocationNumberList                [1]  RelocationNumberList           OPTIONAL,
     an-APDU                             [2]  AccessNetworkSignalInfo        OPTIONAL,
     multicallBearerInfo                 [3]  MulticallBearerInfo            OPTIONAL,
     multipleBearerNotSupported          NULL                                OPTIONAL,
     selectedUMTS-Algorithms             [5]  SelectedUMTS-Algorithms        OPTIONAL,
     chosenRadioResourceInformation      [6] ChosenRadioResourceInformation  OPTIONAL,
     extensionContainer                  [4]  ExtensionContainer             OPTIONAL,
     ...,
     iuSelectedCodec                     [7] Codec                           OPTIONAL,
     iuAvailableCodecsList               [8] CodecList                       OPTIONAL,
     emptySignalInfoAllowed              [x]  NULL                           OPTIONAL }
```

```
SelectedUMTS-Algorithms ::= SEQUENCE {
     integrityProtectionAlgorithm        [0]  ChosenIntegrityProtectionAlgorithm   OPTIONAL,
     encryptionAlgorithm                 [1]  ChosenEncryptionAlgorithm     OPTIONAL,
     extensionContainer                  [2]  ExtensionContainer            OPTIONAL,
     ...}
```

```
ChosenIntegrityProtectionAlgorithm ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete IntegrityProtectionAlgorithm data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
ChosenEncryptionAlgorithm ::= OCTET STRING (SIZE (1))
     -- Octet contains a complete EncryptionAlgorithm data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included in the least significant bits.
```

```
ChosenRadioResourceInformation ::= SEQUENCE {
     chosenChannelInfo                   [0] ChosenChannelInfo               OPTIONAL,
     chosenSpeechVersion                 [1] ChosenSpeechVersion             OPTIONAL,
     ...}
```

```
ChosenChannelInfo ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Chosen Channel information element in 3GPP TS 48.008
```

```
ChosenSpeechVersion ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Speech Version (chosen) information element in 3GPP TS
     -- 48.008
```

```
PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
     targetCellId                        [0] GlobalCellId                    OPTIONAL,
     targetMSC-Number                    [1] ISDN-AddressString,
     targetRNCId                         [2] RNCId                           OPTIONAL,
     an-APDU                             [3]  AccessNetworkSignalInfo        OPTIONAL,
     selectedRab-Id                      [4]  RAB-Id                         OPTIONAL,
     extensionContainer                  [5]  ExtensionContainer             OPTIONAL,
     ...,
     geran-classmark                     [6] GERAN-Classmark                 OPTIONAL,
     rab-ConfigurationIndicator          [7] NULL                            OPTIONAL }
```

```
PrepareSubsequentHO-Res ::= [3] SEQUENCE {
    an-APDU                             AccessNetworkSignalInfo,
    extensionContainer                  [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
ProcessAccessSignalling-Arg ::= [3] SEQUENCE {
    an-APDU                             AccessNetworkSignalInfo,
    selectedUMTS-Algorithms             [1]  SelectedUMTS-Algorithms     OPTIONAL,
    selectedGSM-Algorithm               [2]  SelectedGSM-Algorithm       OPTIONAL,
    chosenRadioResourceInformation      [3] ChosenRadioResourceInformation OPTIONAL,
    selectedRab-Id                      [4] RAB-Id                       OPTIONAL,
    extensionContainer                  [0]  ExtensionContainer          OPTIONAL,
    ...,
    iUSelectedCodec                     [5] Codec                        OPTIONAL,
    iuAvailableCodecsList               [6] CodecList                    OPTIONAL,
    alternativeRAB-ConfRequest          [x]  AlternativeRAB-ConfRequest  OPTIONAL }
```

```
SupportedCodecsList ::= SEQUENCE {
    utranCodecList                      [0] CodecList                    OPTIONAL,
    geranCodecList                      [1] CodecList                    OPTIONAL,
    extensionContainer                  [2] ExtensionContainer           OPTIONAL,
    ...}
```

```
CodecList ::= SEQUENCE {
    codec1                              [1] Codec,
    codec2                              [2] Codec                        OPTIONAL,
    codec3                              [3] Codec                        OPTIONAL,
    codec4                              [4] Codec                        OPTIONAL,
    codec5                              [5] Codec                        OPTIONAL,
    codec6                              [6] Codec                        OPTIONAL,
    codec7                              [7] Codec                        OPTIONAL,
    codec8                              [8] Codec                        OPTIONAL,
    extensionContainer                  [9] ExtensionContainer           OPTIONAL,
    ...}
    -- Codecs are sent in priority order where codec1 has highest priority
```

```
Codec ::= OCTET STRING (SIZE (1..4))

    -- The internal structure is defined as follows:
    -- octet 1                          Coded as Codec Identification code in 3GPP TS 26.103
    -- octets 2,3,4                     Parameters for the Codec as defined in 3GPP TS
    --                                  26.103, if available, length depending on the codec
```

```
GERAN-Classmark ::= OCTET STRING (SIZE (2..87))
    -- Octets are coded according the GERAN Classmark information element in 3GPP TS 48.008
```

```
SelectedGSM-Algorithm ::= OCTET STRING (SIZE (1))
    -- internal structure is coded as Algorithm identifier octet from Chosen Encryption
    -- Algorithm defined in 3GPP TS 48.008
    -- A node shall mark only the selected GSM algorithm
```

```
SendEndSignal-Arg ::= [3] SEQUENCE {
    an-APDU                             AccessNetworkSignalInfo,
    extensionContainer                  [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
SendEndSignal-Res ::= SEQUENCE {
    extensionContainer                  [0]  ExtensionContainer          OPTIONAL,
    ...}
```

```
RNCId ::= OCTET STRING (SIZE (7))
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321                Mobile Country Code 1st digit
    --         bits 8765                Mobile Country Code 2nd digit
    -- octet 2 bits 4321                Mobile Country Code 3rd digit
    --         bits 8765                Mobile Network Code 3rd digit
    --                                  or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321                Mobile Network Code 1st digit
    --         bits 8765                Mobile Network Code 2nd digit
    -- octets 4 and 5                   Location Area Code according to 3GPP TS 24.008
    -- octets 6 and 7                   RNC Id value according to 3GPP TS 25.413
```

```
RelocationNumberList ::= SEQUENCE SIZE (1..maxNumOfRelocationNumber) OF
                                        RelocationNumber
```

```
MulticallBearerInfo ::= INTEGER (1..maxNumOfRelocationNumber)
```

```
RelocationNumber ::= SEQUENCE {
     handoverNumber                         ISDN-AddressString,
     rab-Id                                 RAB-Id,
     -- RAB Identity is needed to relate the calls with the radio access bearers.
     ...}
```

```
RAB-Id ::= INTEGER (1..maxNrOfRABs)
```

```
maxNrOfRABs INTEGER ::= 255
```

```
maxNumOfRelocationNumber  INTEGER ::= 7
```

```
RadioResourceInformation ::= OCTET STRING (SIZE (3..13))
     -- Octets are coded according the Channel Type information element in 3GPP TS 48.008
```

```
IntegrityProtectionInformation ::= OCTET STRING (SIZE (18..maxNumOfIntegrityInfo))
     -- Octets contain a complete IntegrityProtectionInformation data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included, if needed, in the least significant bits of the
     -- last octet of the octet string.
```

```
maxNumOfIntegrityInfo INTEGER ::= 100
```

```
EncryptionInformation ::= OCTET STRING (SIZE (18..maxNumOfEncryptionInfo))
     -- Octets contain a complete EncryptionInformation data type
     -- as defined in 3GPP TS 25.413, encoded according to the encoding scheme
     -- mandated by 3GPP TS 25.413
     -- Padding bits are included, if needed, in the least significant bits of the
     -- last octet of the octet string.
```

```
maxNumOfEncryptionInfo INTEGER ::= 100
```

```
AlternativeRAB-ConfRequest ::= ENUMERATED {
     alternativeRAB-ConfRequested  (0),
     ...}
```

```
-- authentication management types
```

...

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

17.7.8 Common data types

```
MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version9 (9)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   -- general data types and values
   AddressString,
   ISDN-AddressString,
   maxISDN-AddressLength,
   FTN-AddressString,
   ISDN-SubaddressString,
   ExternalSignalInfo,
   Ext-ExternalSignalInfo,
   AccessNetworkSignalInfo,
   SignalInfo,
   maxSignalInfoLength,
   AlertingPattern,
   TBCD-STRING,

   -- data types for numbering and identification
   IMSI,
   TMSI,
   Identity,
   SubscriberId,
   IMEI,
   HLR-List,
   LMSI,
   GlobalCellId,
   NetworkResource,
   AdditionalNetworkResource,
   NAEA-PreferredCI,
   NAEA-CIC,
   ASCI-CallReference,
   SubscriberIdentity,

   -- data types for CAMEL
   CellGlobalIdOrServiceAreaIdOrLAI,
   CellGlobalIdOrServiceAreaIdFixedLength,
   LAIFixedLength,

   -- data types for subscriber management
   BasicServiceCode,
   Ext-BasicServiceCode,
   EMLPP-Info,
   EMLPP-Priority,
   MC-SS-Info,
   MaxMC-Bearers,
   MC-Bearers,
   Ext-SS-Status,

   -- data types for geographic location
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
;

IMPORTS
   TeleserviceCode,
   Ext-TeleserviceCode
FROM MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) version9 (9)}

   BearerServiceCode,
   Ext-BearerServiceCode
FROM MAP-BS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-BS-Code (20) version9 (9)}
```

```
   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version9 (9)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version9 (9)}
;


-- general data types
```

```
TBCD-STRING ::= OCTET STRING
     -- This type (Telephony Binary Coded Decimal String) is used to
     -- represent several digits from 0 through 9, *, #, a, b, c, two
     -- digits per octet, each digit encoded 0000 to 1001 (0 to 9),
     -- 1010 (*), 1011 (#), 1100 (a), 1101 (b) or 1110 (c); 1111 used
     -- as filler when there is an odd number of digits.

     -- bits 8765 of octet n encoding digit 2n
     -- bits 4321 of octet n encoding digit 2(n-1) +1
```

```
AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
     -- This type is used to represent a number for addressing
     -- purposes. It is composed of
     --   a)   one octet for nature of address, and numbering plan
     --        indicator.
     --   b)   digits of an address encoded as TBCD-String.

     -- a)     The first octet includes a one bit extension indicator, a
     --        3 bits nature of address indicator and a 4 bits numbering
     --        plan indicator, encoded as follows:

     -- bit 8: 1  (no extension)

     -- bits 765: nature of address indicator
     --   000  unknown
     --   001  international number
     --   010  national significant number
     --   011  network specific number
     --   100  subscriber number
     --   101  reserved
     --   110  abbreviated number
     --   111  reserved for extension

     -- bits 4321: numbering plan indicator
     --   0000  unknown
     --   0001  ISDN/Telephony Numbering Plan (Rec ITU-T E.164)
     --   0010  spare
     --   0011  data numbering plan (ITU-T Rec X.121)
     --   0100  telex numbering plan (ITU-T Rec F.69)
     --   0101  spare
     --   0110  land mobile numbering plan (ITU-T Rec E.212)
     --   0111  spare
     --   1000  national numbering plan
     --   1001  private numbering plan
     --   1111  reserved for extension

     --   all other values are reserved.

     -- b)     The following octets representing digits of an address
     --        encoded as a TBCD-STRING.
```

```
maxAddressLength  INTEGER ::= 20
```

```
ISDN-AddressString ::=
              AddressString (SIZE (1..maxISDN-AddressLength))
     -- This type is used to represent ISDN numbers.
```

```
maxISDN-AddressLength  INTEGER ::= 9
```

```
FTN-AddressString ::=
            AddressString (SIZE (1..maxFTN-AddressLength))
    -- This type is used to represent forwarded-to numbers.
    -- For long forwarded-to numbers (longer than 15 digits) NPI shall be unknown;
    -- if NAI = international the first digits represent the country code (CC)
    -- and the network destination code (NDC) as for E.164.
```

```
maxFTN-AddressLength  INTEGER ::= 15
```

```
ISDN-SubaddressString ::=
            OCTET STRING (SIZE (1..maxISDN-SubaddressLength))
    -- This type is used to represent ISDN subaddresses.
    -- It is composed of
    --   a)   one octet for type of subaddress and odd/even indicator.
    --   b)   20 octets for subaddress information.

    --   a)   The first octet includes a one bit extension indicator, a
    --        3 bits type of subaddress and a one bit odd/even indicator,
    --        encoded as follows:

    --   bit 8: 1  (no extension)

    --   bits 765: type of subaddress
    --        000  NSAP (X.213/ISO 8348 AD2)
    --        010  User Specified
    --        All other values are reserved

    --   bit 4: odd/even indicator
    --        0  even number of address signals
    --        1  odd number of address signals
    --        The odd/even indicator is used when the type of subaddress
    --        is "user specified" and the coding is BCD.

    --   bits 321: 000 (unused)

    --   b) Subaddress information.
    --   The NSAP X.213/ISO8348AD2 address shall be formatted as specified
    --   by octet 4 which contains the Authority and Format Identifier
    --   (AFI). The encoding is made according to the "preferred binary
    --   encoding" as defined in X.213/ISO834AD2. For the definition
    --   of this type of subaddress, see ITU-T Rec I.334.

    --   For User-specific subaddress, this field is encoded according
    --   to the user specification, subject to a maximum length of 20
    --   octets. When interworking with X.25 networks BCD coding should
    --   be applied.
```

```
maxISDN-SubaddressLength  INTEGER ::= 21
```

```
ExternalSignalInfo ::= SEQUENCE {
    protocolId                      ProtocolId,
    signalInfo                      SignalInfo,
    -- Information about the internal structure is given in
    -- clause 7.6.9.
    extensionContainer              ExtensionContainer              OPTIONAL,
    -- extensionContainer must not be used in version 2
    ...}
```

```
SignalInfo ::= OCTET STRING (SIZE (1..maxSignalInfoLength))
```

```
maxSignalInfoLength  INTEGER ::= 200
    -- This NamedValue represents the theoretical maximum number of octets which is
    -- available to carry a single instance of the SignalInfo data type,
    -- without requiring segmentation to cope with the network layer service.
    -- However, the actual maximum size available for an instance of the data
    -- type may be lower, especially when other information elements
    -- have to be included in the same component.
```

```
ProtocolId ::= ENUMERATED {
    gsm-0408  (1),
    gsm-0806  (2),
    gsm-BSSMAP  (3),
    -- Value 3 is reserved and must not be used
    ets-300102-1  (4)}
```

```
Ext-ExternalSignalInfo ::= SEQUENCE {
     ext-ProtocolId                    Ext-ProtocolId,
     signalInfo                        SignalInfo,
     -- Information about the internal structure is given in
     -- clause 7.6.9.10
     extensionContainer                ExtensionContainer              OPTIONAL,
     ...}
```

```
Ext-ProtocolId ::= ENUMERATED {
     ets-300356  (1),
     ...
      }
-- exception handling:
-- For Ext-ExternalSignalInfo sequences containing this parameter with any
-- other value than the ones listed the receiver shall ignore the whole
-- Ext-ExternalSignalInfo sequence.
```

```
AccessNetworkSignalInfo ::= SEQUENCE {
     accessNetworkProtocolId           AccessNetworkProtocolId,
     signalInfo                        LongSignalInfo,
     -- Information about the internal structure is given in clause 7.6.9.1
     -- This field shall be discarded by receiving entity if value empty (3) is received
     -- in accessNetworkProtocolId field.

     extensionContainer                ExtensionContainer              OPTIONAL,
     ...}
```

```
LongSignalInfo ::= OCTET STRING (SIZE (1..maxLongSignalInfoLength))
```

```
maxLongSignalInfoLength  INTEGER ::= 2560
     -- This Named Value represents the maximum number of octets which is available
     -- to carry a single instance of the LongSignalInfo data type using
     -- White Book SCCP with the maximum number of segments.
     -- It takes account of the octets used by the lower layers of the protocol, and
     -- other information elements which may be included in the same component.
```

```
AccessNetworkProtocolId ::= ENUMERATED {
     ts3G-48006   (1),
     ts3G-25413 (2),
     ...,
     empty (3)}
     -- empty may be used only if indication emptySignalInfoAllowed has been received prior
     -- from the receiving entity during the dialogue.
     -- exception handling:
     -- For AccessNetworkSignalInfo sequences containing this parameter with any
     -- other value than the ones listed the receiver shall ignore the whole
     -- AccessNetworkSignalInfo sequence.
```

```
AlertingPattern ::= OCTET STRING (SIZE (1) )
     -- This type is used to represent Alerting Pattern

     --   bits 8765 : 0000 (unused)

     --   bits 43 : type of Pattern
     --        00 level
     --        01 category
     --        10 category
     --        all other values are reserved.

     --   bits 21 : type of alerting

alertingLevel-0   AlertingPattern ::= '00000000'B
alertingLevel-1   AlertingPattern ::= '00000001'B
alertingLevel-2   AlertingPattern ::= '00000010'B
     -- all other values of Alerting level are reserved
     -- Alerting Levels are defined in GSM 02.07

alertingCategory-1   AlertingPattern ::= '00000100'B
alertingCategory-2   AlertingPattern ::= '00000101'B
alertingCategory-3   AlertingPattern ::= '00000110'B
alertingCategory-4   AlertingPattern ::= '00000111'B
alertingCategory-5   AlertingPattern ::= '00001000'B
     -- all other values of Alerting Category are reserved
     -- Alerting categories are defined in GSM 02.07
```

```
-- data types for numbering and identification
```

```
IMSI ::= TBCD-STRING (SIZE (3..8))
     -- digits of MCC, MNC, MSIN are concatenated in this order.
```

```
Identity ::= CHOICE {
     imsi                                IMSI,
     imsi-WithLMSI                       IMSI-WithLMSI}
```

```
IMSI-WithLMSI ::= SEQUENCE {
     imsi                                IMSI,
     lmsi                                LMSI,
     -- a special value 00000000 indicates that the LMSI is not in use
     ...}
```

```
ASCI-CallReference ::= TBCD-STRING (SIZE (1..8))
     -- digits of VGCS/VBC-area,Group-ID are concatenated in this order.
```

```
TMSI ::= OCTET STRING (SIZE (1..4))
```

```
SubscriberId ::= CHOICE {
     imsi                                [0] IMSI,
     tmsi                                [1] TMSI}
```

```
IMEI ::= TBCD-STRING (SIZE (8))
     --   Refers to International Mobile Station Equipment Identity
     --   and Software Version Number (SVN) defined in TS 3GPP TS 23.003 [17].
     --   If the SVN is not present the last octet shall contain the
     --   digit 0 and a filler.
     --   If present the SVN shall be included in the last octet.
```

```
HLR-Id ::= IMSI
     -- leading digits of IMSI, i.e. (MCC, MNC, leading digits of
     -- MSIN) forming HLR Id defined in TS 3GPP TS 23.003 [17].
```

```
HLR-List ::= SEQUENCE SIZE (1..maxNumOfHLR-Id) OF
                                         HLR-Id
```

```
maxNumOfHLR-Id  INTEGER ::= 50
```

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

```
GlobalCellId ::= OCTET STRING (SIZE (5..7))
     -- Refers to Cell Global Identification defined in TS 3GPP TS 23.003 [17].
     -- The internal structure is defined as follows:
     -- octet 1 bits 4321                Mobile Country Code 1st digit
     --         bits 8765                Mobile Country Code 2nd digit
     -- octet 2 bits 4321                Mobile Country Code 3rd digit
     --         bits 8765                Mobile Network Code 3rd digit
     --                                  or filler (1111) for 2 digit MNCs
     -- octet 3 bits 4321                Mobile Network Code 1st digit
     --         bits 8765                Mobile Network Code 2nd digit
     -- octets 4 and 5                   Location Area Code according to TS 3GPP TS 24.008
[35]
     -- octets 6 and 7                   Cell Identity (CI) according to TS 3GPP TS 24.008
[35]
```

```
NetworkResource ::= ENUMERATED {
     plmn  (0),
     hlr  (1),
     vlr  (2),
     pvlr  (3),
     controllingMSC  (4),
     vmsc  (5),
     eir  (6),
     rss  (7)}
```

```
AdditionalNetworkResource ::= ENUMERATED {
     sgsn (0),
     ggsn (1),
     gmlc (2),
     gsmSCF (3),
     nplr (4),
     auc (5),
     ...}
     -- if unknown value is received in AdditionalNetworkResource
     -- it shall be ignored.
```

```
NAEA-PreferredCI ::= SEQUENCE {
    naea-PreferredCIC                   [0] NAEA-CIC,
    extensionContainer                  [1] ExtensionContainer          OPTIONAL,
    ...}
```

```
NAEA-CIC ::= OCTET STRING (SIZE (3))
    -- The internal structure is defined by the Carrier Identification
    -- parameter in ANSI T1.113.3. Carrier codes between "000" and "999" may
    -- be encoded as 3 digits using "000" to "999" or as 4 digits using
    -- "0000" to "0999". Carrier codes between "1000" and "9999" are encoded
    -- using 4 digits.
```

```
SubscriberIdentity ::= CHOICE {
    imsi                                [0] IMSI,
    msisdn                              [1] ISDN-AddressString
    }
```

```
LCSClientExternalID ::= SEQUENCE {
    externalAddress                     [0] ISDN-AddressString          OPTIONAL,
    extensionContainer                  [1] ExtensionContainer          OPTIONAL,
    ... }
```

```
LCSClientInternalID ::= ENUMERATED {
    broadcastService                    (0),
    o-andM-HPLMN                        (1),
    o-andM-VPLMN                        (2),
    anonymousLocation                   (3),
    targetMSsubscribedService           (4),
    ... }
-- for a CAMEL phase 3 PLMN operator client, the value targetMSsubscribedService shall be used
```

```
LCSServiceTypeID ::= INTEGER (0..127)
    -- the integer values 0-63 are reserved for Standard LCS service types
    -- the integer values 64-127 are reserved for Non Standard LCS service types
```

```
-- Standard LCS Service Types
emergencyServices                       LCSServiceTypeID ::= 0
emergencyAlertServices                  LCSServiceTypeID ::= 1
personTracking                          LCSServiceTypeID ::= 2
fleetManagement                         LCSServiceTypeID ::= 3
assetManagement                         LCSServiceTypeID ::= 4
trafficCongestionReporting              LCSServiceTypeID ::= 5
roadsideAssistance                      LCSServiceTypeID ::= 6
routingToNearestCommercialEnterprise    LCSServiceTypeID ::= 7
navigation                              LCSServiceTypeID ::= 8
    --this service type is reserved for use in previous releases
citySightseeing                         LCSServiceTypeID ::= 9
localizedAdvertising                    LCSServiceTypeID ::= 10
mobileYellowPages                       LCSServiceTypeID ::= 11
trafficAndPublicTransportationInfo      LCSServiceTypeID ::= 12
weather                                 LCSServiceTypeID ::= 13
assetAndServiceFinding                  LCSServiceTypeID ::= 14
gaming                                  LCSServiceTypeID ::= 15
findYourFriend                          LCSServiceTypeID ::= 16
dating                                  LCSServiceTypeID ::= 17
chatting                                LCSServiceTypeID ::= 18
routeFinding                            LCSServiceTypeID ::= 19
whereAmI                                LCSServiceTypeID ::= 20

-- The values of LCSServiceTypeID are defined according to 3GPP TS 22.071.
```

```
-- Non Standard LCS Service Types
serv64                                      LCSServiceTypeID ::= 64
serv65                                      LCSServiceTypeID ::= 65
serv66                                      LCSServiceTypeID ::= 66
serv67                                      LCSServiceTypeID ::= 67
serv68                                      LCSServiceTypeID ::= 68
serv69                                      LCSServiceTypeID ::= 69
serv70                                      LCSServiceTypeID ::= 70
serv71                                      LCSServiceTypeID ::= 71
serv72                                      LCSServiceTypeID ::= 72
serv73                                      LCSServiceTypeID ::= 73
serv74                                      LCSServiceTypeID ::= 74
serv75                                      LCSServiceTypeID ::= 75
serv76                                      LCSServiceTypeID ::= 76
serv77                                      LCSServiceTypeID ::= 77
serv78                                      LCSServiceTypeID ::= 78
serv79                                      LCSServiceTypeID ::= 79
serv80                                      LCSServiceTypeID ::= 80
serv81                                      LCSServiceTypeID ::= 81
serv82                                      LCSServiceTypeID ::= 82
serv83                                      LCSServiceTypeID ::= 83
serv84                                      LCSServiceTypeID ::= 84
serv85                                      LCSServiceTypeID ::= 85
serv86                                      LCSServiceTypeID ::= 86
serv87                                      LCSServiceTypeID ::= 87
serv88                                      LCSServiceTypeID ::= 88
serv89                                      LCSServiceTypeID ::= 89
serv90                                      LCSServiceTypeID ::= 90
serv91                                      LCSServiceTypeID ::= 91
serv92                                      LCSServiceTypeID ::= 92
serv93                                      LCSServiceTypeID ::= 93
serv94                                      LCSServiceTypeID ::= 94
serv95                                      LCSServiceTypeID ::= 95
serv96                                      LCSServiceTypeID ::= 96
serv97                                      LCSServiceTypeID ::= 97
serv98                                      LCSServiceTypeID ::= 98
serv99                                      LCSServiceTypeID ::= 99
serv100                                     LCSServiceTypeID ::= 100
serv101                                     LCSServiceTypeID ::= 101
serv102                                     LCSServiceTypeID ::= 102
serv103                                     LCSServiceTypeID ::= 103
serv104                                     LCSServiceTypeID ::= 104
serv105                                     LCSServiceTypeID ::= 105
serv106                                     LCSServiceTypeID ::= 106
serv107                                     LCSServiceTypeID ::= 107
serv108                                     LCSServiceTypeID ::= 108
serv109                                     LCSServiceTypeID ::= 109
serv110                                     LCSServiceTypeID ::= 110
serv111                                     LCSServiceTypeID ::= 111
serv112                                     LCSServiceTypeID ::= 112
serv113                                     LCSServiceTypeID ::= 113
serv114                                     LCSServiceTypeID ::= 114
serv115                                     LCSServiceTypeID ::= 115
serv116                                     LCSServiceTypeID ::= 116
serv117                                     LCSServiceTypeID ::= 117
serv118                                     LCSServiceTypeID ::= 118
serv119                                     LCSServiceTypeID ::= 119
serv120                                     LCSServiceTypeID ::= 120
serv121                                     LCSServiceTypeID ::= 121
serv122                                     LCSServiceTypeID ::= 122
serv123                                     LCSServiceTypeID ::= 123
serv124                                     LCSServiceTypeID ::= 124
serv125                                     LCSServiceTypeID ::= 125
serv126                                     LCSServiceTypeID ::= 126
serv127                                     LCSServiceTypeID ::= 127
```

-- data types for CAMEL

```
CellGlobalIdOrServiceAreaIdOrLAI ::= CHOICE {
     cellGlobalIdOrServiceAreaIdFixedLength   [0] CellGlobalIdOrServiceAreaIdFixedLength,
     laiFixedLength                       [1] LAIFixedLength}
```

```
CellGlobalIdOrServiceAreaIdFixedLength ::= OCTET STRING (SIZE (7))
    -- Refers to Cell Global Identification or Service Are Identification
    -- defined in 3GPP TS 23.003.
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321                Mobile Country Code 1st digit
    --         bits 8765                Mobile Country Code 2nd digit
    -- octet 2 bits 4321                Mobile Country Code 3rd digit
    --         bits 8765                Mobile Network Code 3rd digit
    --                                  or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321                Mobile Network Code 1st digit
    --         bits 8765                Mobile Network Code 2nd digit
    -- octets 4 and 5                   Location Area Code according to 3GPP TS 24.008
    -- octets 6 and 7                   Cell Identity (CI) value or
    --                                  Service Area Code (SAC) value
    --                                  according to 3GPP TS 23.003
```

```
LAIFixedLength ::= OCTET STRING (SIZE (5))
    -- Refers to Location Area Identification defined in TS 3GPP TS 23.003 [17].
    -- The internal structure is defined as follows:
    -- octet 1 bits 4321                Mobile Country Code 1st digit
    --         bits 8765                Mobile Country Code 2nd digit
    -- octet 2 bits 4321                Mobile Country Code 3rd digit
    --         bits 8765                Mobile Network Code 3rd digit
    --                                  or filler (1111) for 2 digit MNCs
    -- octet 3 bits 4321                Mobile Network Code 1st digit
    --         bits 8765                Mobile Network Code 2nd digit
    -- octets 4 and 5                   Location Area Code according to TS 3GPP TS 24.008
[35]
```

-- data types for subscriber management

```
BasicServiceCode ::= CHOICE {
    bearerService                   [2] BearerServiceCode,
    teleservice                     [3] TeleserviceCode}
```

```
Ext-BasicServiceCode ::= CHOICE {
    ext-BearerService               [2] Ext-BearerServiceCode,
    ext-Teleservice                 [3] Ext-TeleserviceCode}
```

```
EMLPP-Info ::= SEQUENCE {
    maximumentitledPriority         EMLPP-Priority,
    defaultPriority                 EMLPP-Priority,
    extensionContainer              ExtensionContainer              OPTIONAL,
    ...}
```

```
EMLPP-Priority ::= INTEGER (0..15)
    -- The mapping from the values A,B,0,1,2,3,4 to the integer-value is
    -- specified as follows where A is the highest and 4 is the lowest
    -- priority level
    -- the integer values 7-15 are spare and shall be mapped to value 4
```

```
priorityLevelA                      EMLPP-Priority ::= 6
priorityLevelB                      EMLPP-Priority ::= 5
priorityLevel0                      EMLPP-Priority ::= 0
priorityLevel1                      EMLPP-Priority ::= 1
priorityLevel2                      EMLPP-Priority ::= 2
priorityLevel3                      EMLPP-Priority ::= 3
priorityLevel4                      EMLPP-Priority ::= 4
```

```
MC-SS-Info ::= SEQUENCE {
    ss-Code                         [0] SS-Code,
    ss-Status                       [1] Ext-SS-Status,
    nbrSB                           [2] MaxMC-Bearers,
    nbrUser                         [3] MC-Bearers,
    extensionContainer              [4] ExtensionContainer          OPTIONAL,
    ...}
```

```
MaxMC-Bearers ::= INTEGER (2..maxNumOfMC-Bearers)
```

```
MC-Bearers ::= INTEGER (1..maxNumOfMC-Bearers)
```

```
maxNumOfMC-Bearers  INTEGER ::= 7
```

```
Ext-SS-Status ::= OCTET STRING (SIZE (1..5))

    -- OCTET 1:
    --
    -- bits 8765: 0000 (unused)
    -- bits 4321: Used to convey the "P bit","R bit","A bit" and "Q bit",
    --            representing supplementary service state information
    --            as defined in TS 3GPP TS 23.011 [22]

    -- bit 4: "Q bit"

    -- bit 3: "P bit"

    -- bit 2: "R bit"

    -- bit 1: "A bit"

    -- OCTETS 2-5: reserved for future use. They shall be discarded if
    -- received and not understood.
```

```
   -- data types for geographic location

AgeOfLocationInformation ::= INTEGER (0..32767)
-- the value represents the elapsed time in minutes since the last
-- network contact of the mobile station (i.e. the actuality of the
-- location information).
-- value “0” indicates that the MS is currently in contact with the
--           network
-- value “32767” indicates that the location information is at least
--               32767 minutes old
```

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3GPP TSG-CT WG4 Meeting #27 **C4-050855**
Cancun, MEXICO. 25th to 29th April 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.010** **CR** **111** ⌘ **rev** **2** ⌘ Current version: **6.5.0** ⌘

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

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

Title:	⌘	Full RANAP support of network initiated SCUDIF
Source:	⌘	Nokia
Work item code:	⌘	TEI6
Date:	⌘	28/04/2005
Category:	⌘	**F**
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:	⌘	CT3 and RAN3 have specified the solution for network-initiated service change for SCUDIF. For that solution to be complete some information needs to be transferred between MSCs during handover/relocation. Following information needs to be transferred from the anchor-MSC to the non-anchor MSC and stored by the non-anchor MSC: - Alternative Channel Type when BSSAP is used as an access network protocol between MSCs. - Alternative RAB Parameters Value when RANAP is used as an access network protocol between MSCs.
Summary of change:	⌘	Description of the inforamtion transfer of parameters Alternative Channel Type and Alternative RAB Parameters Value has been added to the specification.
Consequences if not approved:	⌘	The network-initiated service change for SCUDIF functionality would be incomplete.

Clauses affected:	⌘	4.5.5, 4.7.5, 4.8.5

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		23.009 CR 104, 29.002 CR 751
			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.

4.5.5 Processing in MSC-B, and information transfer on E-interface

The following parameters require processing (e.g. to store the parameter, to internally generate the parameter) in MSC-B. The relevant BSSMAP procedures are mentioned to ease the comprehension, their detailed description is the scope of 3GPP TS 48.008. Each BSSMAP message listed in 3GPP TS 49.008 being transferred on E-interface shall use the mechanisms given in subclause 4.5.4 and is described in 3GPP TS 48.008.

For intra-MSC-B handover/relocation and security interworking , after inter-MSC handover from GSM to GSM, the 3G_MSC-B needs additional information to be able to perform security mode and integrity protection procedures. These RANAP informations are transferred between MSC-A and 3G-MSC-B in MAP messages, defined in 3GPP TS 29.002.

For subsequent handover/relocation, after inter-MSC handover from GSM to GSM, the 3G_MSC-B needs additional information to be able to perform service handover procedures. The relevant information is transferred between MSC-A and 3G-MSC-B in MAP messages, defined in 3GPP TS 29.002.

For subsequent handover/relocation, after inter-MSC handover from GSM to GSM, the 3G_MSC-B needs additional information to be able to forward access rights information in the context of Shared Network to the RAN. The relevant information is transferred between MSC-A and 3G-MSC-B in MAP messages, defined in 3GPP TS 29.002.

4.5.5.1 Encryption Information

A sequence of possible encryption algorithms can be sent to a BSS in Cipher Mode Command or Handover Request. The BSS chooses one of the listed algorithms and reports this back to the MSC in Cipher Mode Complete or Handover Request Acknowledge respectively.

The list of algorithms, the ciphering key and the chosen algorithm shall be stored by MSC-B, and the chosen value sent to MSC-A.

Transfer of Information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by MSC-A after the completion of Inter-MSC Handover.

Ciphering control towards MSC-B:

If Ciphering has been performed before Inter-MSC Handover:

- in the Handover Request BSSMAP message (information included).

  The Handover Request Acknowledge should in this case contain the indication of the chosen algorithm.

If Ciphering has NOT been performed before Inter-MSC Handover:

- in the Cipher Mode Command procedure between MSC-A and MSC-B.

If the encryption algorithm is changed at an intra-BSS handover in BSS-B this must be reported to MSC-A in:

- the BSSMAP Handover Performed procedure.

If the encryption algorithm is changed at an intra-MSC handover in MSC-B this must be reported to MSC-A in:

- the BSSMAP Handover Performed procedure which shall be initiated by MSC-B on reception from BSS-B of the Handover Complete message (the information being previously received in the Handover Request Acknowledge message).

  Note also that the chosen encryption value may be contained in the BSSMAP Assignment Complete message. This may happen if the encryption value changes e.g. at a second assignment during a call (e.g. from TCH to SDCCH).

4.5.5.2 Channel Type

Assignment Request and Handover Request (BSSMAP) may give the BSS a choice, in the same way as the Encryption Algorithm above. Depending on the Channel Type Info, the chosen channel may have impact on subsequent handovers, internal in MSC-B and inter-MSC controlled by MSC-A. Some values in channel Type Info indicate that if a particular channel once has been chosen, the same type must be used for the rest of the call.

The Channel Type, and the characteristics of the chosen channel shall be stored by MSC-B, and the Chosen Channel and/or Speech Version information elements transferred to MSC-A.

Transfer of Information:

Independently of the type of resource (Signalling only (e.g. SDCCH) or TCH) assigned to the MS, the Channel Type Information is transferred to MSC-B in:

- the Handover Request BSSMAP message, and the Chosen Channel and/or Speech Version should be reported back to MSC-A in the Handover Request Acknowledge.

If a new type of resource is to be assigned after Inter-MSC Handover, this can be made with:

- the BSSMAP Assignment procedure between MSC-A and MSC-B (Chosen Channel and/or Speech Version in Assignment Complete).

If the Channel Type (the chosen channel and/or chosen speech version) is changed at an intra-BSS handover in BSS-B this must be reported to MSC-A in:

- the BSSMAP Handover Performed procedure.

If the Channel Type (the chosen channel or chosen speech version) is changed at an intra-MSC handover in MSC-B this must be reported to MSC-A in:

- the BSSMAP Handover Performed procedure which shall be initiated by MSC-B on reception from BSS-B of the Handover Complete message (the information being previously received in the Handover Request Acknowledge message).

4.5.5.3 Classmark

This information shall be stored by MSC-B and might be received either from MSC-A, or from the MS when the MS initiates a Classmark Update.

Transfer of Information due to Classmark received from MSC-A:

This information shall be stored by MSC-B and is received:

- in the Handover Request BSSMAP message.

If a new type of resource is to be assigned after Inter-MSC Handover, Classmark Information MAY be included:

- in the BSSMAP Assignment procedure.

Transfer of Information, due to "Classmark Signalling Procedures".

This information shall be stored by MSC-B and can be received:

- Due to a classmark update, either requested from MSC-A (Classmark Request, Classmark Update), or an MS-Initiated Classmark Update.

This can be carried out either with:

- the BSSMAP Classmark procedure(s).

Apart from these cases there is the "odd" case where a Classmark Update can be received during an Inter-MSC Handover by MSC-B, i.e. before the MS has moved to the new channel controlled by MSC-B. This can be made with transparent transfer of BSSMAP Classmark Update.

4.5.5.4 Downlink DTX-Flag

The parameter shall be stored by MSC-B to be used at internal Handover in MSC-B.

Transfer of Information:

Received by MSC-B from MSC-A in either:

If the MS has already been assigned to a TCH for speech before the Inter-MSC Handover, the DTX-flag should be sent in:

- the Handover Request BSSMAP message;

(if the type of resource is not TCH for speech, the DTX-flag shall not be included).

If a new assignment to a TCH for speech after an Inter-MSC Handover is to be performed, this can be made with:

- the BSSMAP Assignment procedure.

4.5.5.5 Priority

The parameter shall be stored by MSC-B and is received according to below:

Transfer of Information:

Received by MSC-B from MSC-A in:

- the Handover Request BSSMAP message.

If a change is needed after an Inter-MSC Handover with:

- the BSSMAP Assignment procedure.

4.5.5.6 MSC/BSC-Invoke Trace Information Elements

The process to be performed by MSC-B on the information elements of the MSC or BSC Invoke Trace BSSMAP messages is left for further study.

4.5.5.7 LSA Identifier List

The parameter shall be stored by MSC-B and is received according to below:

Transfer of Information:

Received by MSC-B from MSC-A in:

- the Handover Request BSSMAP message.

If a change is needed after an Inter-MSC Handover with:

- the LSA Information BSSMAP message.

4.5.5.8 Selected UMTS Algorithm

After inter-MSC handover, the 3G_MSC-B can perform intra-MSC GSM to UMTS handover. A sequence of possible encryption and integrity protection algorithms, received from the 3G_MSC-A, can be sent to an RNS in Relocation Request or in Security Mode Command in case of cipher mode setting after intra.MSC-B handover from GSM to UMTS. The RNS chooses one of the listed algorithms and reports this back to the 3G_MSC in Relocation Request Acknowledge or Security Mode Complete respectively. The MSC-B provides the Selected UMTS algorithm information to the MSC-A. The Selected UMTS algorithms IE in the MAP Process Access Signalling Request message refers to the Chosen Integrity Protection Algorithm and Chosen Encryption Algorithm, defined in RANAP specification 3GPP TS 25.413

The selected algorithm shall be stored by 3G_MSC-B, and sent to 3G_MSC-A.

Transfer of Information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Handover and possibly after intra-MSC-B handover from GSM to UMTS. In both cases Selected UMTS algorithm information is received by 3G_MSC-A from 3G_MSC-B in:

– The Process Access Signalling Request MAP message.

4.5.5.9 Allowed UMTS Algorithms

In case of GSM-subscriber, the Integrity Protection Information and UMTS Encryption Information are not transferred to the MSC-B during inter-MSC handover. Allowed UMTS algorithms is UMTS information that is required in RANAP Relocation Request and RANAP Security Mode Command, and shall be provided by 3G_MSC-A. 3G_MSC-B needs this information in case of an intra-MSC GSM to UMTS handover and in subsequent security mode setting, after an inter-MSC handover. Therefore 3G_MSC-A must provide this information in case of an inter-MSC GSM to GSM handover. The Allowed UMTS algorithms IE in the MAP Prepare Handover and in the MAP Forward Access Signalling Request messages refers to the Permitted Integrity Protection Algorithms in Integrity Protection Information and Permitted Encryption Algorithms in Encryption Information, defined in RANAP specification 3GPP TS 25.413.

Allowed UMTS algorithms shall be stored by 3G_MSC-B.

Transfer of information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Handover.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Handover:

– The Prepare Handover Request MAP message.

If Ciphering has NOT been performed before Inter-MSC Handover:

– The Forward Access Signalling Request MAP message.

4.5.5.10 BSSMAP Service Handover

This information shall be stored by 3G_MSC-B and sent to a BSS in Handover Request, when 3G_MSC-B performs handover to GSM.

Transfer of information:

The BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the Handover Request BSSMAP message.

If a new assignment of a TCH after an inter-MSC handover is to be performed, the BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the BSSMAP Assignment procedure.

4.5.5.11 RANAP Service Handover

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request, when 3G_MSC-B performs relocation or handover to UMTS.

Transfer of information:

The RANAP Service Handover information is transferred to 3G_MSC-B in:

– the Prepare Handover Request MAP message.

If a new assignment of a Radio Access Bearer after an inter-MSC handover is to be performed, the information is transferred to 3G_MSC-B in:

– the Forward Access Signalling Request MAP message

and sent by 3G_MSC-B to the RNS in RAB Assignment Request.

4.5.5.12 SNA Access Information

This information shall be stored by 3G_MSC-B and sent to an RNS in the Relocation Request message when 3G_MSC-B performs handover to UMTS.

Transfer of information:

The SNA Access Information is transferred to 3G_MSC-B in:

– the Handover Request BSSMAP message.

4.5.5.13 UESBI

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request, when 3G_MSC-B performs relocation or handover to UMTS.

Transfer of information:

The UESBI information is transferred to 3G_MSC-B in:

- the Prepare Handover Request MAP message.

4.5.5.xx Alternative Channel Type

This information shall be stored by 3G_MSC-B and from this information 3G_MSC-B shall generate Alternative RAB Parameters Value IE sent to an RNS in Relocation Request, when 3G_MSC-B performs relocation or handover to UMTS.

Transfer of information:

The Alternative Channel Type information is transferred to 3G_MSC-B in:

– the Prepare Handover Request MAP message.

If a new assignment of a Radio Access Bearer after an inter-MSC handover is to be performed, the information is transferred to 3G_MSC-B in:

– the Forward Access Signalling Request MAP message.

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

4.7.5 Processing in 3G_MSC-B, and information transfer on E-interface

The following parameters require processing (e.g. to store the parameter, to internally generate the parameter) in MSC-B. The relevant BSSMAP procedures are mentioned to ease the comprehension, their detailed description is the scope of 3GPP TS 48.008. Each BSSMAP message listed in 3GPP TS 49.008 being transferred on E-interface shall use the mechanisms given in subclause 4.5.4 and is described in 3GPP TS 48.008.

4.7.5.1 Encryption Information

The list of GSM algorithms, the ciphering key and the chosen algorithm shall be stored by 3G_MSC-B and used for generating the UMTS parameters Encryption Information and Integrity Protection Information if they are not received in MAP Prepare Handover Request (the generation of the UMTS parameters from the GSM parameters is described in TS 33.102).

Transfer of Information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by MSC-A after the completion of Inter-MSC Handover.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Handover:

- in the Handover Request BSSMAP message (information included).

  The Handover Request Acknowledge should in this case NOT contain the indication of the chosen algorithm.

If Ciphering has NOT been performed before Inter-MSC Handover:

- in the Cipher Mode Command procedure between MSC-A and 3G_MSC-B.

4.7.5.2 Channel Type

The Channel Type shall be stored by 3G_MSC-B and used for generating RAB parameters.

Transfer of Information:

Independently of the type of resource (Signalling only or traffic channel) assigned to the MS, the Channel Type Information is transferred to 3G_MSC-B in:

- the Handover Request BSSMAP message.

  Chosen Channel and/or Speech Version shall NOT be reported back to MSC-A in the Handover Request Acknowledge

If a new type of resource is to be assigned after Inter-MSC Handover, this can be made with:

- the BSSMAP Assignment procedure between MSC-A and 3G_MSC-B.

4.7.5.3 Classmark

This information shall be stored by 3G_MSC-B and might be received from MSC-A.

Transfer of Information due to Classmark received from MSC-A:

This information shall be stored by 3G_MSC-B and is received:

- in the Handover Request BSSMAP message.

If a new type of resource is to be assigned after Inter-MSC Handover, Classmark Information MAY be included:

- in the BSSMAP Assignment procedure.

4.7.5.4 Priority

The parameter shall be stored by 3G_MSC-B and used for generating RAB parameters. It is received as detailed below:

Transfer of Information:

Received by 3G_MSC-B from MSC-A in:

- the Handover Request BSSMAP message.

If a change is needed after an Inter-MSC Handover with:

- the BSSMAP Assignment procedure.

4.7.5.5 MSC-Invoke Trace Information Elements

The process to be performed by 3G_MSC-B on the information elements of the MSC Invoke Trace BSSMAP messages is left for further study.

Note that MSC-A does not forward BSC Invoke Trace in case of GSM to UMTS handover.

4.7.5.6 Selected UMTS Algorithm

A sequence of possible encryption and integrity protection algorithms, received from the 3G_MSC-A, can be sent to an RNS in Relocation Request or in Security Mode Command in case of cipher mode setting after inter-MSC handover from GSM to UMTS. The RNS chooses one of the listed algorithms and reports this back to the 3G_MSC in Relocation Request Acknowledge or Security Mode Complete respectively. The MSC-B provides the Selected UMTS algorithm information to the MSC-A. The Selected UMTS algorithms IE in the MAP Process Access Signalling Request and MAP Prepare Handover Response messages refers to the Chosen Integrity Protection Algorithm and Chosen Encryption Algorithm, defined in RANAP specification 3GPP TS 25.413

The selected algorithm shall be stored by 3G_MSC-B, and sent to 3G_MSC-A.

Transfer of Information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Handover.

If Ciphering has been performed before Inter-MSC Handover, Selected UMTS algorithm information is received by 3G_MSC-A from 3G_MSC-B in:

– The Prepare Handover Response MAP message.

If Ciphering has NOT been performed before Inter-MSC Handover, Selected UMTS algorithm information is received by 3G_MSC-A from 3G_MSC-B in:

– The Process Access Signalling Request MAP message.

4.7.5.7 Allowed UMTS Algorithms

In case of GSM-subscriber, the Integrity Protection Information and UMTS Encryption Information are not transferred to the MSC-B during inter-MSC handover from GSM to UMTS. Allowed UMTS algorithms is UMTS information that is required in RANAP Relocation Request and RANAP Security Mode Command, and shall be provided by 3G_MSC-A. 3G_MSC-B needs this information in case of an inter-MSC GSM to UMTS handover and in subsequent security mode setting, after an inter-MSC GSM to UMTS handover. Therefore 3G_MSC-A must provide this information in case of an inter-MSC GSM to UMTS handover. The Allowed UMTS algorithms IE in the MAP Prepare Handover and in the MAP Forward Access Signalling Request messages refers to the Permitted Integrity Protection Algorithms in Integrity Protection Information and Permitted Encryption Algorithms in Encryption Information, defined in RANAP specification 3GPP TS 25.413.

Allowed UMTS algorithms shall be stored by 3G_MSC-B.

Transfer of information:

If ciphering has not been performed before Inter-MSC Handover, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Handover.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Handover:

– The Prepare Handover Request MAP message.

If Ciphering has NOT been performed before Inter-MSC Handover:

– The Forward Access Signalling Request MAP message.

4.7.5.8 BSSMAP Service Handover

This information shall be stored by 3G_MSC-B and sent to a BSS in Handover Request, when 3G_MSC-B performs handover to GSM.

Transfer of information:

The BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the Handover Request BSSMAP message.

If a new assignment of a TCH after an inter-MSC handover is to be performed, the BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the BSSMAP Assignment procedure.

4.7.5.9 RANAP Service Handover

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request during the basic inter-MSC handover or when 3G_MSC-B performs a subsequent relocation or handover to UMTS.

Transfer of information:

The RANAP Service Handover information is transferred to 3G_MSC-B in:

– the Prepare Handover Request MAP message.

If a new assignment of a Radio Access Bearer after an inter-MSC handover is to be performed, the information is transferred to 3G_MSC-B in:

– the Forward Access Signalling Request MAP message

and sent by 3G_MSC-B to the RNS in RAB Assignment Request.

4.7.5.10 GERAN Classmark

The GERAN Classmark shall be stored by 3G_MSC-B and can be received from MSC-A, from the serving BSS or serving RNS, or from the target RNS. The GERAN Classmark shall be used together with other parameters, e.g. the Channel Type, for selecting a service and for generating RAB parameters for handover to GERAN Iu-mode, subsequent relocation or handover to GERAN Iu-mode, and RAB (re-)assignment when the MS is in GERAN Iu-mode.

Transfer of Information due to GERAN Classmark received from MSC-A:

Received by 3G_MSC-B in:

- the Prepare Handover Request MAP message.

Transfer of Information due to GERAN Classmark received from the serving BSS or serving RNS:

Received by 3G_MSC-B in:

- the Handover Required BSSMAP message;
- the Relocation Required RANAP message;
- the Initial UE RANAP message; or
- the RAB Assignment Response RANAP message.

Transfer of Information due to GERAN Classmark received from the target RNS:

Received by 3G_MSC-B in:

- the Relocation Failure RANAP message.

4.7.5.11 SNA Access Information

This information shall be stored by 3G_MSC-B and sent to an RNS in the Relocation Request message when 3G_MSC-B performs handover to UMTS.

Transfer of information:

The SNA Access Information is transferred to 3G_MSC-B in:

– the Handover Request BSSMAP message.

4.7.5.12 UESBI

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request during the basic inter-MSC handover or when 3G_MSC-B performs a subsequent relocation or handover to UMTS.

Transfer of information:

The UESBI information is transferred to 3G_MSC-B in:

- the Prepare Handover Request MAP message.

4.7.5.xx Alternative Channel Type

This information shall be stored by 3G_MSC-B and from this information 3G_MSC-B shall generate Alternative RAB Parameters Value IE sent to an RNS in Relocation Request, when 3G_MSC-B performs relocation or handover to UMTS.

Transfer of information:

The Alternative Channel Type information is transferred to 3G_MSC-B in:

– the Prepare Handover Request MAP message.

If a new assignment of a Radio Access Bearer after an inter-MSC handover is to be performed, the information is transferred to 3G_MSC-B in:

– the Forward Access Signalling Request MAP message.

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

4.8.5 Processing in 3G_MSC-B, and information transfer on E-interface

The following parameters require processing (e.g. to store the parameter, to internally generate the parameter) in 3G_MSC-B. The relevant RANAP procedures are mentioned to ease the comprehension, their detailed description is the scope of the TS 25.413. Each RANAP message being transferred on E-interface shall use the mechanisms given in subclause 4.8.4 and is described in TS 25.413.

4.8.5.1 Integrity Protection Information

A sequence of possible integrity protection algorithms can be sent to an RNS in Security Mode Command or Relocation Request. The RNS chooses one of the listed algorithms and reports this back to the 3G_MSC in Security Mode Complete or Relocation Request Acknowledge respectively.

The list of algorithms, the integrity protection key and the chosen algorithm shall be stored by 3G_MSC-B.

Transfer of Information:

If integrity protection has not been performed before Inter-MSC Relocation, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Relocation.

Integrity protection control towards 3G_MSC-B:

If Integrity protection has been performed before Inter-MSC Relocation:

- in the Relocation Request RANAP message (information included).

  The Relocation Request Acknowledge should in this case contain the indication of the chosen algorithm.

If Integrity protection has NOT been performed before Inter-MSC Relocation:

- in the Security Mode Command procedure between 3G_MSC-A and 3G_MSC-B.

4.8.5.2 Encryption Information

A sequence of possible encryption algorithms can be sent to an RNS in Security Mode Command or Relocation Request. The RNS chooses one of the listed algorithms and reports this back to the 3G_MSC in Security Mode Complete or Relocation Request Acknowledge respectively.

The list of algorithms, the ciphering key and the chosen algorithm shall be stored by 3G_MSC-B, and the chosen value sent to 3G_MSC-A.

Transfer of Information:

If ciphering has not been performed before Inter-MSC Relocation, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Relocation.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Relocation:

- in the Relocation Request RANAP message (information included).

  The Relocation Request Acknowledge should in this case contain the indication of the chosen algorithm.

If Ciphering has NOT been performed before Inter-MSC Relocation:

- in the Security Mode Command procedure between 3G_MSC-A and 3G_MSC-B.

4.8.5.3 RAB Parameters

The parameters shall be stored by 3G_MSC-B to be used at internal Relocation in 3G_MSC-B.

Transfer of information:

Received by 3G_MSC-B from 3G_MSC-A in:

– The Relocation Request RANAP message.

If a new type of resource is to be assigned after Inter-MSC Relocation, this can be made with:

– The RAB Assignment Request RANAP message.

4.8.5.4 Channel Type

Channel Type is GSM information that is required in BSSMAP Handover Request and BSSMAP Assignment Request, and it shall be provided by 3G_MSC-A. 3G_MSC-B needs this information in case of an intra-MSC UMTS to GSM handover after an inter-MSC relocation and subsequent assignment procedures. The Channel Type derived from the Bearer Capability that is available in 3G_MSC-A. This mapping is described in 3GPP TS 27.001. Therefore 3G_MSC-A must provide this information in case of an inter-MSC relocation. The Radio Resource Information IE in the MAP Prepare Handover message refers to the Channel Type GSM information.

Channel Type shall be stored by 3G_MSC-B.

Transfer of information:

Received by 3G_MSC-B from 3G_MSC-A in:

- The Prepare Handover Request MAP message.
- The Forward Access Signalling Request message.

4.8.5.5 Selected GSM Algorithm

After inter-MSC relocation, the 3G_MSC-B can perform intra-MSC UMTS to GSM handover. A sequence of possible encryption algorithms, received from the 3G_MSC-A, can be sent to an BSS in Handover Request or in Cipher Mode Command in case of cipher mode setting after intra.MSC-B handover from UMTS to GSM. The BSS chooses one of the listed algorithms and reports this back to the 3G_MSC in Handover Request Acknowledge or Cipher Mode Complete respectively. The MSC-B provides the Selected GSM algorithm information to the MSC-A. The Selected GSM algorithms IE in the MAP Process Access Signalling Request message refers to the Algorithm identifier octet in the Chosen Encryption Algorithm GSM information.

The chosen algorithm shall be stored by 3G_MSC-B, and sent to 3G_MSC-A.

Transfer of Information:

If ciphering has not been performed before Inter-MSC Relocation, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Relocation.

If Ciphering has been performed before Inter-MSC Relocation, Selected GSM algorithm information is received by 3G_MSC-A from 3G_MSC-B in:

- The Handover Performed BSSMAP message.

If Ciphering has NOT been performed before Intra-MSC-B handover from UMTS to GSM after Inter-MSC Relocation, Selected GSM algorithm information is received by 3G_MSC-A from 3G_MSC-B in:

- The Process Access Signalling Request MAP message.

4.8.5.6 Allowed GSM Algorithms

Allowed GSM algorithms is GSM information that is required in BSSMAP Handover Request and BSSMAP Cipher Mode Command, and shall be provided by 3G_MSC-A. 3G_MSC-B needs this information in case of an intra-MSC UMTS to GSM handover and in subsequent ciphering mode setting, after an inter-MSC relocation. Therefore 3G_MSC-A must provide this information in case of an inter-MSC relocation. The Allowed GSM algorithms IE in the MAP Prepare Handover and in the MAP Forward Access Signalling Request messages refers to the Algorithm identifier octet in the Permitted Algorithms GSM information.

Allowed GSM algorithms shall be stored by 3G_MSC-B.

Transfer of information:

If ciphering has not been performed before Inter-MSC Relocation, this will be controlled by 3G_MSC-A after the completion of Inter-MSC Relocation.

Ciphering control towards 3G_MSC-B:

If Ciphering has been performed before Inter-MSC Relocation:

- The Prepare Handover Request MAP message.

If Ciphering has NOT been performed before Inter-MSC Relocation:

– The Forward Access Signalling Request MAP message.

4.8.5.7 Chosen Channel

BSSMAP Assignment Request may give the BSS some freedom in the selection of radio resource (for instance channel rate selection, speech version selection etc.). Chosen Channel and/or Speech Version is reported back to 3G_MSC-B in BSSMAP Assignment Complete. The Chosen Radio Resource Information IE in the MAP Prepare Handover Response and Process Access Signalling Request messages refers to the Chosen Channel and/or Speech Version GSM information.

The Channel Type and the characteristics of the chosen channel shall be stored by 3G_MSC-B, and the Chosen Channel and/or Speech Version information elements shall be transferred to MSC-A or 3G_MSC-A.

Transfer of information:

Received by MSC-A or 3G_MSC-A from 3G_MSC-B in:

– The Prepare Handover Response MAP message

– The Process Access Signalling request MAP message

4.8.5.8 BSSMAP Service Handover

This information shall be stored by 3G_MSC-B and sent to a BSS in Handover Request, when 3G_MSC-B performs handover to GSM.

Transfer of information:

The BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the Prepare Handover Request MAP message.

If a new assignment of a TCH after an inter-MSC relocation is to be performed, the BSSMAP Service Handover information is transferred to 3G_MSC-B in:

– the Forward Access Signalling Request MAP message

and sent by 3G_MSC-B to the BSS in the Assignment Request BSSMAP message.

4.8.5.9 RANAP Service Handover

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request during the basic inter-MSC relocation or when 3G_MSC-B performs a subsequent intra-MSC relocation or handover to UMTS.

Transfer of information:

The RANAP Service Handover information is transferred to 3G_MSC-B in:

– the Relocation Request RANAP message.

If a new assignment of a Radio Access Bearer after an inter-MSC relocation is to be performed, the information is transferred to 3G_MSC-B in:

– the RANAP RAB Assignment procedure.

4.8.5.10 GERAN Classmark

The GERAN Classmark shall be stored by 3G_MSC-B and can be received from MSC-A, from the serving BSS or serving RNS, or from the target RNS. The GERAN Classmark shall be used together with other parameters, e.g. the Channel Type, for selecting a service and for generating RAB parameters for relocation to GERAN Iu-mode, subsequent relocation or handover to GERAN Iu-mode, and RAB (re-)assignment when the MS is in GERAN Iu-mode.

Transfer of Information due to GERAN Classmark received from MSC-A:

Received by 3G_MSC-B in:

- the Prepare Handover Request MAP message.

Transfer of Information due to GERAN Classmark received from the serving RNS:

Received by 3G_MSC-B in:

- the Handover Required BSSMAP message;
- the Relocation Required RANAP message;
- the Initial UE RANAP message; or
- the RAB Assignment Response RANAP message.

Transfer of Information due to GERAN Classmark received from the target RNS:

Received by 3G_MSC-B in:

- the Relocation Failure RANAP message.

4.8.5.11 SNA Access Information

This information shall be stored by 3G_MSC-B and sent to an RNS in the Relocation Request message when 3G_MSC-B performs handover to UMTS.

Transfer of information:

The SNA Access Information is transferred to 3G_MSC-B in:

- the Relocation Request RANAP message encapsulated in the Prepare Handover request MAP message.

4.8.5.12 UESBI

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request during the basic inter-MSC relocation or when 3G_MSC-B performs a subsequent intra-MSC relocation or handover to UMTS.

Transfer of information:

The UESBI information is transferred to 3G_MSC-B in:

- the Relocation Request RANAP message.

4.8.5.xx Alternative RAB Parameters Value

This information shall be stored by 3G_MSC-B and sent to an RNS in Relocation Request during the basic inter-MSC relocation or when 3G_MSC-B performs a subsequent intra-MSC relocation or handover to UMTS.

Transfer of information:

The Alternative RAB Parameters Value information is transferred to 3G_MSC-B in:

– the Relocation Request RANAP message.

If an assignment of a Radio Access Bearer after an inter-MSC relocation is to be performed, the information is transferred to 3G_MSC-B in:

– the RAB Assignment Request RANAP message.