3GPP TSG CN Plenary Meeting #17 **NP-020358**
4th - 6th September 2002. Biarritz, France.

Title:	**LS on Shared Networks**
Release:	**Release 5**
Source:	**CN4**
Agenda item:	**5.1**
Document for:	**INFORMATION**

3GPP TSG CN WG4 Meeting #15 ***N4-021098***
Helsinki, Finland, 29th July – 2nd August 2002

Title:	**LS on Shared Networks**
Response to:	**LS R3-021795 (N4-020818) on Shared Networks from RAN3.** **LS R3-021816 (N4-020865) on Shared Networks – Outcome of RAN3#30 from RAN3.** **LS S2-022054 (N4-020872) on Shared Networks from SA2**
Release:	**Release 5**
Source:	**CN4**
To:	**RAN3, SA2, GERAN, GERAN2**
Cc:	**CN**

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1. Overall Description:

TSG CN4 would like to thank RAN3 and SA2 for their LS's R3-021795, R3-021816 and S2-022054 on Shared Networks.

In response to the action for CN4 outlined in LS R3-021795, CN4 would like to confirm that the RAN3 assumption:

> The understanding in TSG RAN WG3 is that the underlying assumption in TSG CN WG4 is that all the Subscriber Access Information (for instance, to which SNA the Subscriber is allowed to access) is located in the Anchor MSC and, during a Handover in CS Domain involving 2 MSCs, it is passed over to the Non-Anchor MSC over the E-interface

is indeed correct.

In response to the action for CN4 outlined in LS S2-022054 and LS R3-021816 asking for modifications of the relevant TS's, CN4 could unfortunately not agree on a single solution to transport the SNA Access Information from anchor MSC to non anchor MSC for an inter-MSC Handover.

The discussion point has been whether the SNA Access Information should be transferred from anchor MSC to non anchor MSC as MAP parameter of the MAP operation Prepare Handover, or as a BSSMAP parameter to be carried in the BSSMAP Handover Request message encapsulated in the MAP operation Prepare Handover for the Inter MSC GSM to GSM, UMTS to GSM and GSM to UMTS Handover.

The majority view expressed at CN4 was that the transport at BSSMAP level is preferred, but this preference needs to be confirmed by GERAN.

The first alternative solution, transport at MAP level, can be completed by modifications to only CN4 specifications.

The second alternative solution, transport at BSSMAP level, requires modifications to CN4 specifications and to specifications in the remit of GERAN.

However, in the wish to provide a solution in the required time frame, CN4 has agreed to produce two sets of CR's to the relevant specifications.

The first set being all the necessary modifications needed if the transport of the SNA Access Information at MAP level is used. The set consists of a CR on 29.002 and one on 29.010.

The second set being all the necessary modifications needed on CN4 specifications if the transport of the SNA Access Information at BSSMAP level is used. This second set of CR's depends on the approval at GERAN of all the CR's necessary to GERAN specifications (e.g. 48.008). This set consists of only one CR on 29.010.

Moreover two additional CR's have been agreed, one of them together with CN1. Those CR's, on 23.003 and 23.009, are equally applicable for both solutions.

In response to the action for CN4 outlined in LS S2-022054, CN4 would like to reassure SA2 that the modifications agreed for both solutions cater for the requirements on Shared Network in connected mode for all relevant traffic cases including GSM to UMTS inter-MSC handover.

It's CN4 assessment that no further work is necessary on CN4 specifications.

> NOTE: The agreed CR's are attached to this LS in three zip files. One for the CR's implementing the transport at MAP level, one for the CR implementing the transport at BSSMAP level, one for the CR's independent of the selected transport.

2. Actions:

To RAN3, SA2

ACTION: CN4 kindly asks RAN3 and SA2 to note CN4 reply to their LS's.

To GERAN, GERAN2

ACTION: CN4 kindly asks GERAN and GERAN2 to investigate on the feasibility and appropriateness of transporting the SNA Access Information at BSSMAP level, and, if deemed so, to produce the necessary CR's to the relevant specifications.

3. Date of Next CN4 Meetings:

CN4 #16	23rd Sep. – 27th Sep. 2002	Miami, USA
CN4 #17	11th Nov. – 15th Nov. 2002	Bangkok, Thailand

3GPP TSG CN WG4 Meeting #15 ***N4-021104***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.010** **CR** **075** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

*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:	⌘	Support for Shared Network in connected mode (using encapsulated BSSAP transport of SNA access information)
Source:	⌘	Nokia
Work item code:	⌘	TEI5
Date:	⌘	01/08/2002
Category:	⌘	**B**
Release:	⌘	REL-5

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:
2 (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)

Reason for change:	⌘	RAN#3 has agreed on a solution for the support of Shared Networks in connected mode in Release 5. See TR R3:012 available in LS N4-020865 (R3-021816). The agreed solution is based on the concept of SNA, which is basically a collection of Location Areas. A set of allowed SNA's is associated to each IMSI serie. The set of allowed SNA's, the SNA Access Information, is signalled to the Radio Network when a call is setup, so that the Radio Network can decide whether a subscriber can be handed over when moving to a new Location Area, i.e. if he has authorization to get service in that Location Area. During the Handover procedure the anchor MSC has to inform the non-anchor MSC about the SNA Access Information of the subscriber so that non-anchor MSC shall be able to forward this information to the Radio Network when performing subsequent intra-MSC handovers. The allowed SNA's are added to PrepareHandover.
Summary of change:	⌘	The list of allowed SNA's is added to MAP PrepareHandover.
Consequences if not approved:	⌘	Support of Shared Network in connected mode would not be available after an inter-MSC Handover.

Clauses affected:	⌘	

		Y	N			
Other specs	⌘	**Y**		Other core specifications	⌘	48.008 CR xxx 23.003 CR 050 23.009 CR xxx
affected:			**N**	Test specifications		
			N	O&M Specifications		
Other comments:	⌘					

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

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

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

4.5 Inter-MSC Handover

…

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.

****** NEXT ADDED SECTION ******

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.

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

4.7 Inter-MSC Handover (GSM to UMTS)

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4.7.1 Basic Inter-MSC Handover

When a Mobile Station is handed over between two MSCs, the establishment of a connection between them (described in 3GPP TS 23.009) requires interworking between A-Interface, Iu-Interface and E-Interface.

The signalling at initiation, execution and completion of the Basic Inter-MSC handover procedure is shown in figures 37 to 42 with both possible positive or negative outcomes.

Additionally figure 37b shows the possible interworking when the trace related message is transparently transferred on the E-Interface at Basic Inter-MSC Handover initiation.

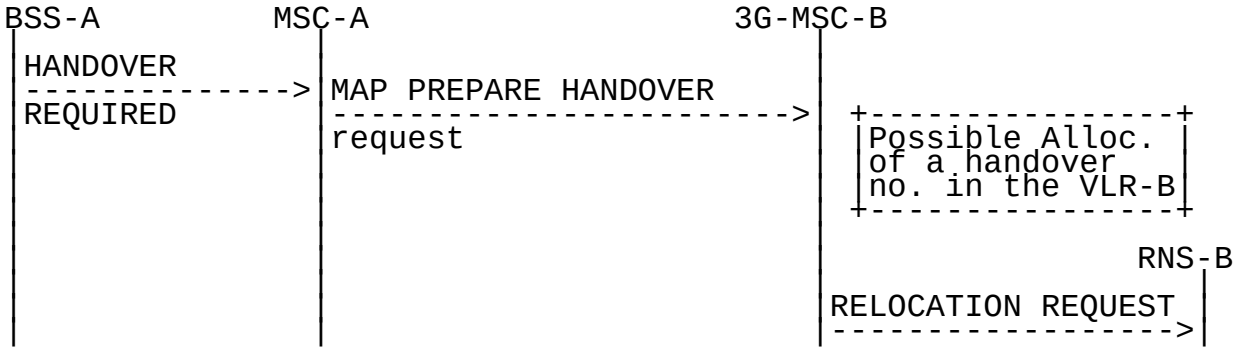


Figure 37a: Signalling for Basic Inter-MSC Handover initiation (no trace related messages transferred)

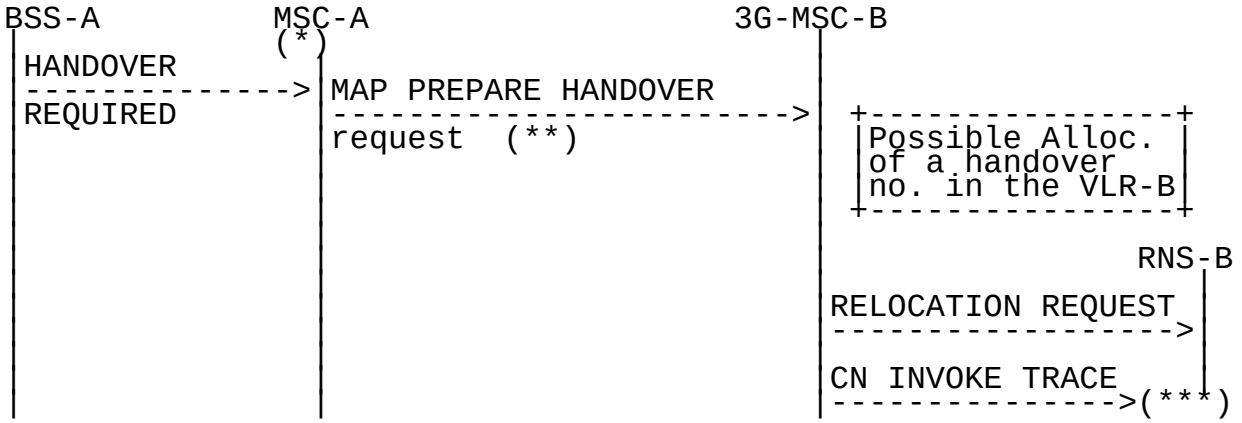


Figure 37b: Signalling for Basic Inter-MSC Handover initiation (CN invoke trace message transferred)

(*): Tracing invocation has been received from VLR.

(**): In that case, HANDOVER REQUEST and MSC INVOKE TRACE messages are included within the AN-apdu parameter.

(***): CN INVOKE TRACE is forwarded to RNS-B if supported by 3G_MSC-B.

Possible Positive outcomes: successful radio resources allocation and handover number allocation (if performed):

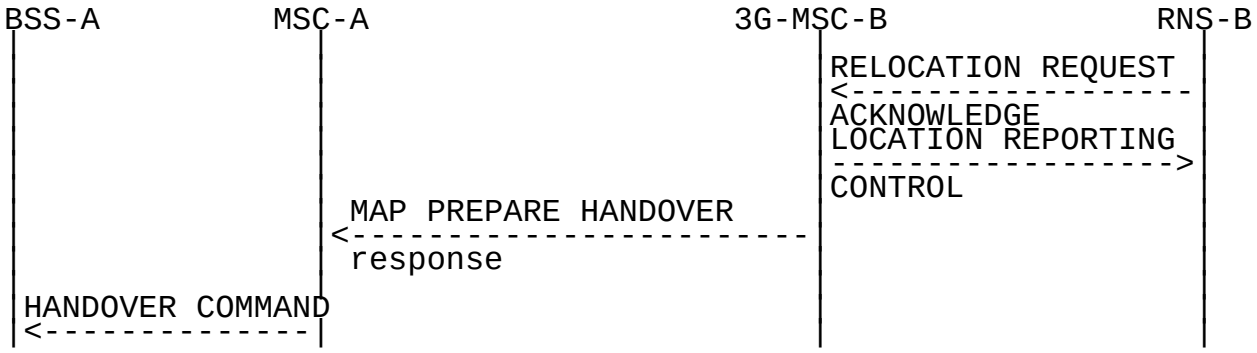
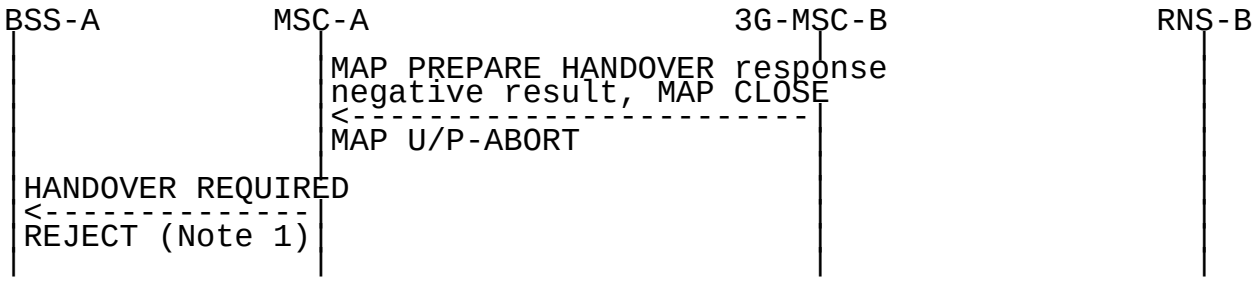


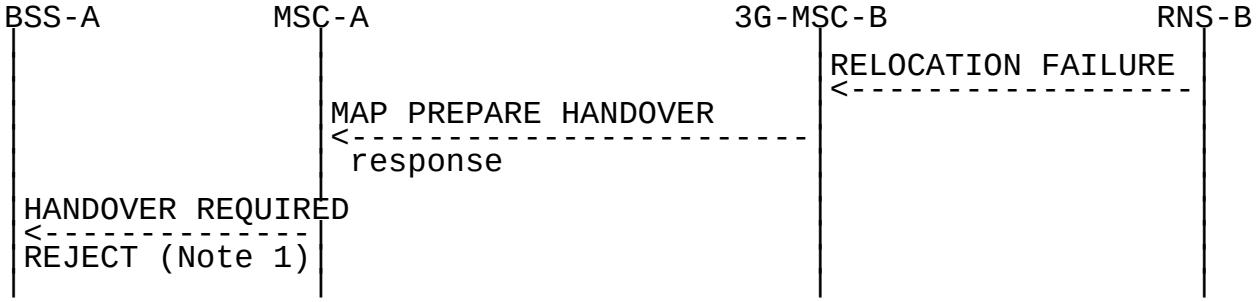
Figure 38: Signalling for Basic Inter-MSC Handover execution (Positive outcome)

Possible Negative outcomes:

a) user error detected, or handover number allocation unsuccessful (if performed), or component rejection or dialogue abortion performed by 3G_MSC-B:



b) radio resources allocation failure:



c) unsuccessful handover execution (Reversion to the old radio resources):

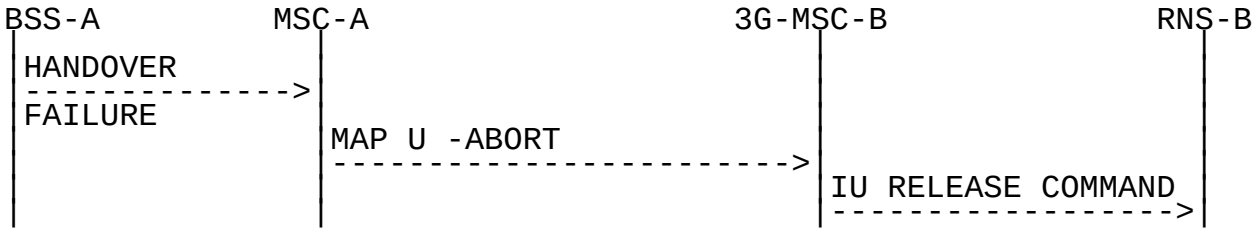


Figure 39: Signalling for Basic Inter-MSC Handover execution (Negative outcomes)

NOTE 1: Possible rejection of the handover because of the negative outcome of MAP or RANAP procedure.

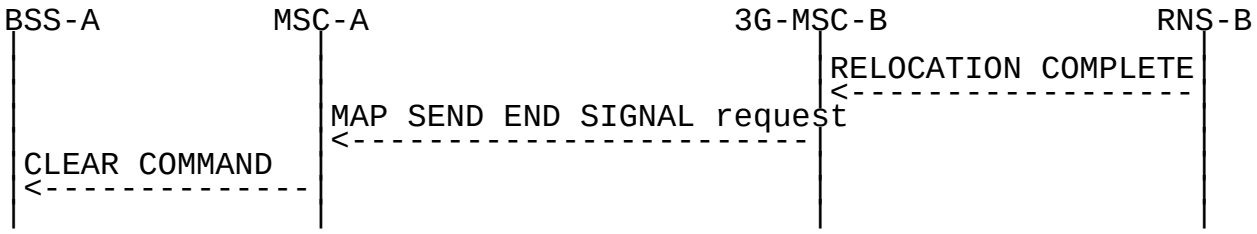


Figure 40: Signalling for Basic Inter-MSC Handover completion

Positive outcome:

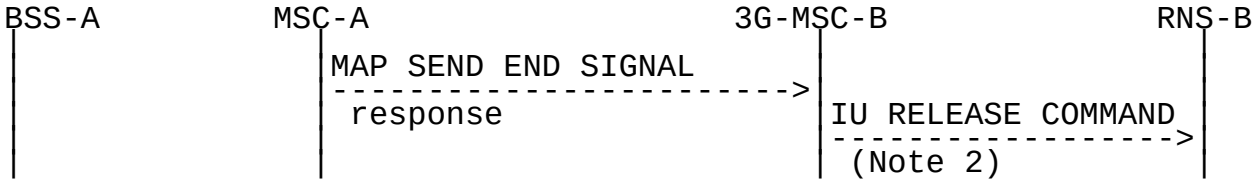


Figure 41: Signalling for Basic Inter-MSC Handover completion (Positive outcome)

Negative outcome:

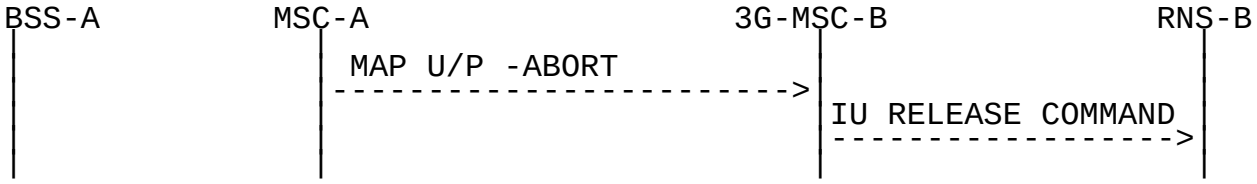


Figure 42: Signalling for Basic Inter-MSC Handover completion (Negative outcome)

NOTE 2: From interworking between MAP and RANAP point of view, when the call is released.

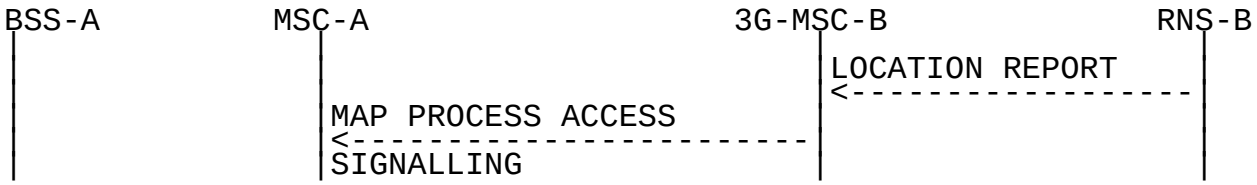


Figure 42a: Signalling for updating of anchor MSC after change of location in RNS

The handover procedure is normally triggered by BSS-A by sending a HANDOVER REQUIRED message on A-Interface to MSC-A. The invocation of the Basic Inter-MSC handover procedure is performed and controlled by MSC-A. The sending of the MAP Prepare-Handover request to 3G_MSC-B is triggered in MSC-A upon receipt of the HANDOVER REQUIRED message. The identity of the target RNC where the call is to be handed over in 3G_MSC-B area, provided in the HANDOVER REQUIRED message in the information element Cell Identifier List (Preferred), is mapped to the target RNC Id MAP parameter and the HANDOVER REQUEST message is encapsulated in the an-APDU MAP parameter of the Prepare-Handover MAP request. 3G_MSC-B can invoke another operation towards the VLR-B (allocation of the handover number described in 3GPP TS 29.002).

Additionally, if tracing activity has been invoked, the trace related message can be transferred on the E-Interface encapsulated in the an-APDU MAP parameter of the Prepare-Handover Request. If transferred, one complete trace related message at a time shall be included in the an-APDU MAP parameter after the HANDOVER REQUEST message. Note: UMTS supports only CN initiated tracing.

The interworking between Prepare Handover and HANDOVER REQUIRED is as follows:

	408.008	—	29.002	Notes
Forward message	HANDOVER REQUIRED BSSMAP information elements	MAP PREPARE HANDOVER request -ho-NumberNotRequired -target RNC Id -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)		1 2 3 4
Positive result		MAP PREPARE HANDOVER response -handover number -an-APDU(HANDOVER REQUEST ACKNOWLEDGE or HANDOVER FAILURE)		5
Negative result	HANDOVER REQUIRED REJECT equipment failure equipment failure equipment failure equipment failure equipment failure equipment failure	MAP PREPARE HANDOVER System Failure No Handover Number available UnexpectedDataValue Data Missing MAP CLOSE MAP U/P -ABORT		6

NOTE 1: The ho-NumberNotRequired parameter is included by MSC-A, when MSC-A decides not to use any circuit connection with 3G_MSC-B. No handover number shall be present in the positive result. Any negative response from 3G_MSC-B shall not be due to handover number allocation problem.

NOTE 2: Integrity protection information, encryption information and IMSI parameters are included by MSC-A, only when the MSC-A uses 29.002 as per release 99. These IEs are not included if the MSC-A is R98 or earlier.

NOTE 3: The process performed on the BSSMAP information elements received in the HANDOVER REQUIRED message is described in the 3GPP TS~~GSM Recommendation~~ ~~40~~8.008.

NOTE 4: The process performed on the BSSMAP information elements received in the MSC INVOKE TRACE message is described in subclause 4.5.5.6.

NOTE 5: The response to the Prepare-Handover request can include in its an-APDU parameter, identifying the GSM 08.06 protocol, either a BSSMAP HANDOVER REQUEST ACKNOWLEDGE or a BSSMAP HANDOVER FAILURE.

In the first case, the positive result triggers in MSC-A the sending on A-Interface of the HANDOVER COMMAND.

In the second case, the positive result triggers in MSC-A optionally the sending of the HANDOVER REQUIRED REJECT.

(The possible sending of the HANDOVER REQUIRED REJECT message upon receipt of the HANDOVER FAILURE is out of the scope of 3GPP TS 29.010 and lies in 3GPP TS 48.008).

NOTE 6: The possible sending of the HANDOVER REQUIRED REJECT message is described in 3GPP TS 48.008.

The interworking between Prepare Handover and RELOCATION REQUEST in 3G_MSC-B is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -ho-NumberNotRequired -target RNC Id -IMSI -Integrity protection info -Encryption info -RANAP service handover -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	RELOCATION REQUEST	1
	BSSMAP information elements: Channel Type Cause sRNC to tRNC container SNA Access Information	RANAP information elements: RAB parameters Cause sRNC to tRNC container SNA Access Information	2
		info stored/generated in/by 3G_MSC-B: CN domain indicator	
Positive result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER REQUEST ACK)	RELOCATION REQUEST ACK	
	BSSMAP information elements: Layer 3 info	RANAP information elements: tRNC to sRNC container	
Negative result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER FAILURE)	RELOCATION FAILURE	

NOTE 1: Integrity protection information, encryption information, IMSI and RANAP service handover parameters are included by MSC-A, only when the MSC-A uses 29.002 as per release 99. These IEs are not included if the MSC-A is R98 or earlier.

NOTE 2: SNA Access Information parameter is included by MSC-A, only when the MSC-A uses 29.002 as per release 5. These IEs are not included if the MSC-A is release 4 or earlier.

The interworking between Send End Signal and RELOCATION COMPLETE in 3G_MSC-B is as follows:

	25.413	29.002	Notes
Forward message	RELOCATION COMPLETE	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	
Positive result	IU RELEASE COMMAND -Normal release	MAP SEND END SIGNAL response	1
Negative result	IU RELEASE COMMAND -Normal release -Normal release	MAP CLOSE MAP U/P -ABORT	2

NOTE 1: The positive empty result triggers the clearing of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B. If a circuit connection is used between MSC-A and 3G_MSC-B, the 'Normal release' clearing cause shall only be given to RNS-B when 3G_MSC-B has received a clearing indication on its circuit connection with MSC-A.

NOTE 2: The abortion of the dialogue or the rejection of the component triggers in 3G_MSC-B the clearing of its circuit connection with MSC-A, if any, of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B.

The interworking between Send End Signal and CLEAR COMMAND in MSC-A is as follows:

	29.002	08.08	Notes
Forward message	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	CLEAR COMMAND - Handover Successful	
Positive result			
Negative result			

The interworking between HANDOVER FAILURE in case of reversion to old channel of the MS and User Abort in MSC-A is as follows:

	~~40~~8.~~0~~08	29.002	Notes
Forward message	HANDOVER FAILURE - Reversion to old channel	MAP U -ABORT	
Positive result			
Negative result			

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

4.7.4 BSSAP Messages transfer on E-Interface

The handling is described in chapter 4.5.4, additional cases are described in this chapter.

4.7.4.1 Assignment

The interworking between the BSSMAP assignment messages in MAP and the RANAP RAB assignment messages is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -RANAP service handover -an-APDU(ASSIGNMENT REQUEST) BSSMAP information elements: Channel Type	RAB ASSIGNMENT REQ Service handover RANAP information elements: RAB parameters	
Positive result	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT COMPLETE or ASSIGNMENT FAILURE) BSSMAP information elements: Cause	 RAB ASSIGNMENT RESPONSE (positive result) RAB ASSIGNMENT RESPONSE (negative result) RANAP information elements: Cause	 1
Negative result		MAP U/P –ABORT	

****** NEXT ADDED SECTION ******

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

…

4.7.5.10 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.

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

4.8 Inter-MSC Relocation

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

…..

4.8.5.10 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.

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

3GPP TSG CN WG4 Meeting #15 ***N4-021102***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **466** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

*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 **X**

Title:	⌘	Support for Shared Network in connected mode
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	09/07/2002
Category:	⌘	**B**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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D *(editorial modification)*
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Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	RAN#3 has agreed on a solution for the support of Shared Networks in connected mode in Release 5. See TR R3:012 available in LS N4-020865 (R3-021816). The agreed solution is based on the concept of SNA, which is basically a collection of Location Areas. A set of allowed SNA's is associated to each IMSI serie. The set of allowed SNA's, the SNA Access Information, is signalled to the Radio Network when a call is setup, so that the Radio Network can decide whether a subscriber can be handed over when moving to a new Location Area, i.e. if he has authorization to get service in that Location Area. During the Handover procedure the anchor MSC has to inform the non-anchor MSC about the SNA Access Informationof the subscriber so that non-anchor MSC shall be able to forward this information to the Radio Network when performing subsequent intra-MSC handovers. The allowed SNA's are added to PrepareHandover. .
Summary of change:	⌘	The list of allowed SNA's is added to MAP PrepareHandover.
Consequences if not approved:	⌘	Support of Shared Network in connected mode would not be available after an inter-MSC Handover.

Clauses affected:	⌘	7.6, 7.6.6.4, 8.4.1.2, 8.4.1.3, 17.7.1

		Y	N			
Other specs	⌘	X		Other core specifications	⌘	29.010 CR 058 23.003 CR 050 23.009 CR 080
affected:			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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

7.6 Definition of parameters

Following is an alphabetic list of parameters used in the common MAP-services in clause 7.3:

Application context name	7.3.1	Refuse reason	7.3.1
Destination address	7.3.1	Release method	7.3.2
Destination reference	7.3.1	Responding address	7.3.1
Diagnostic information	7.3.4	Result	7.3.1
Originating address	7.3.1	Source	7.3.5
Originating reference	7.3.1	Specific information	7.3.1/7.3.2/7.3.4
Problem diagnostic	7.3.6	User reason	7.3.4
Provider reason	7.3.5		

Following is an alphabetic list of parameters contained in this clause:

Absent Subscriber Diagnostic SM	7.6.8.9	Invoke Id	7.6.1.1
Access connection status	7.6.9.3	ISDN Bearer Capability	7.6.3.41
		IST Alert Timer	7.6.3.66
		IST Information Withdrawn	7.6.3.68
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		LCS Codeword Notification	7.6.11.22
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Additional Location Estimate	7.6.11.21	LMSI	7.6.2.16
Additional number	7.6.2.46	Location Information	7.6.2.30

Additional signal info	7.6.9.10
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Current password	7.6.4.21
Deferred MT-LR Data	7.6.11.3
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Multicall Bearer Information	7.6.2.52
Multiple Bearer Requested	7.6.2.53
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Extensible Forwarding info	7.6.3.15
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Extensible Forwarding Options	7.6.3.18
Extensible No reply condition timer	7.6.3.19
Extensible QoS-Subscribed	7.6.3.74
Extensible SS-Data	7.6.3.29
Extensible SS-Info	7.6.3.14
Extensible SS-Status	7.6.3.17
Extensible Teleservice	7.6.3.4
External Signal Information	7.6.9.4
Failure Cause	7.6.7.9
Forwarded-to number	7.6.2.22
Forwarded-to subaddress	7.6.2.23
Forwarding feature	7.6.4.16
Forwarding information	7.6.4.15
Forwarding Options	7.6.4.6
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GGSN number	7.6.2.41
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GPRS Node Indicator	7.6.8.14
GPRS Subscription Data	7.6.3.46
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GPRS Support Indicator	7.6.8.15
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SM-RP-MTI	7.6.8.16
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SM-RP-PRI	7.6.8.5
SM-RP-SMEA	7.6.8.17
SM-RP-UI	7.6.8.4
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****** NEXT MODIFIED SECTION ******

7.6.6 Radio parameters

7.6.6.1 - 7.6.6.34 Void

7.6.6.4 SNA Access Information

This parameter refers to the information element SNA Access Information ~~information element~~ defined in 3GPP TS 25.413.

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

8.4 Handover services

It should be noted that the handover services used on the B-interface have not been updated for Release 99. The B-interface is not fully operational specified. It is strongly recommended not to implement the B-interface as an external interface.

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(=)		
BSSMAP Service Handover	C	C(=)		

RANAP Service Handover	C	C(=)		
SNA Access Information	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(=)
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 3G 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 3G 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.

BSSMAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available.

RANAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available.

SNA Access Information

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the UE is not currently involved in an Emergency Call. This parameter shall not be included if the access network protocol is RANAP.

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.

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 ******

17.7 MAP constants and data types

17.7.1 Mobile Service data types

```
MAP-MS-DataTypes {
   ccitt identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}

DEFINITIONS
```

****** Unchanged text removed for clarity ******

```
-- 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 }

AllowedGSM-Algorithms ::= OCTET STRING (SIZE (1))
     -- internal structure is coded as Algorithm identifier octet from
     -- Permitted Algorithms defined in 3G 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 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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,
     sna-AccessInformation               [15] SNA-AccessInformation          OPTIONAL
      }
```

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

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

```
RadioResourceList ::= SEQUENCE SIZE (2.. 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
```

```
SNA-AccessInformation ::= OCTET STRING (SIZE (5..maxNumOfSNAAccessInfoLength))
     -- Octets contain a complete SNA Access Information data type
     -- as defined in 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G TS 25.413
     -- Padding bits are included, if needed, in the least significant bits of the
     -- last octet of the octet string.
```

```
maxNumOfSNAAccessInfoLength INTEGER ::= 200
```

```
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,
     ...}
```

```
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 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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 3G TS 48.008
```

```
ChosenSpeechVersion ::= OCTET STRING (SIZE (1))
     -- Octets are coded according the Speech Version (chosen) information element in 3G 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,
     ...}
```

```
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,
     ...}
```

```
SelectedGSM-Algorithm ::= OCTET STRING (SIZE (1))
     -- internal structure is coded as Algorithm identifier octet from Chosen Encryption
     -- Algorithm defined in 3G 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 3G TS 24.008
     -- octets 6 and 7                  RNC Id value according to 3G 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 3G TS 48.008
```

```
IntegrityProtectionInformation ::= OCTET STRING (SIZE (18..maxNumOfIntegrityInfo))
     -- Octets contain a complete IntegrityProtectionInformation data type
     -- as defined in 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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 3G TS 25.413, encoded according to the encoding scheme
     -- mandated by 3G 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
```

****** Unchanged text removed for clarity ******

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

3GPP TSG CN WG4 Meeting #15 ***N4-021103***
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.010** **CR** **058** ⌘ **rev** **1** ⌘ Current version: **5.0.0** ⌘

*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 **X**

Title:	⌘	Support for Shared Network in connected mode
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	09/07/2002
Category:	⌘	**B**
Release:	⌘	REL-5

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:

2	*(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)*

Reason for change:	⌘	RAN#3 has agreed on a solution for the support of Shared Networks in connected mode in Release 5. See TR R3:012 available in LS N4-020865 (R3-021816). The agreed solution is based on the concept of SNA, which is basically a collection of Location Areas. A set of allowed SNA's is associated to each IMSI serie. The set of allowed SNA's, the SNA Access Information, is signalled to the Radio Network when a call is setup, so that the Radio Network can decide whether a subscriber can be handed over when moving to a new Location Area, i.e. if he has authorization to get service in that Location Area. During the Handover procedure the anchor MSC has to inform the non-anchor MSC about the SNA Access Information of the subscriber so that non-anchor MSC shall be able to forward this information to the Radio Network when performing subsequent intra-MSC handovers. The allowed SNA's are added to PrepareHandover.
Summary of change:	⌘	The list of allowed SNA's is added to MAP PrepareHandover.
Consequences if not approved:	⌘	Support of Shared Network in connected mode would not be available after an inter-MSC Handover.

Clauses affected:	⌘	

		Y	N			
Other specs	⌘	**X**		Other core specifications	⌘	29.002 CR 466 23.003 CR 050 23.009 CR 080
affected:			**X**	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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

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

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

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

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

4.5 Inter-MSC Handover

…

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.

****** NEXT ADDED SECTION ******

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 Prepare Handover Request MAP message.

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

4.7 Inter-MSC Handover (GSM to UMTS)

…

4.7.1 Basic Inter-MSC Handover

When a Mobile Station is handed over between two MSCs, the establishment of a connection between them (described in 3GPP TS 23.009) requires interworking between A-Interface, Iu-Interface and E-Interface.

The signalling at initiation, execution and completion of the Basic Inter-MSC handover procedure is shown in figures 37 to 42 with both possible positive or negative outcomes.

Additionally figure 37b shows the possible interworking when the trace related message is transparently transferred on the E-Interface at Basic Inter-MSC Handover initiation.

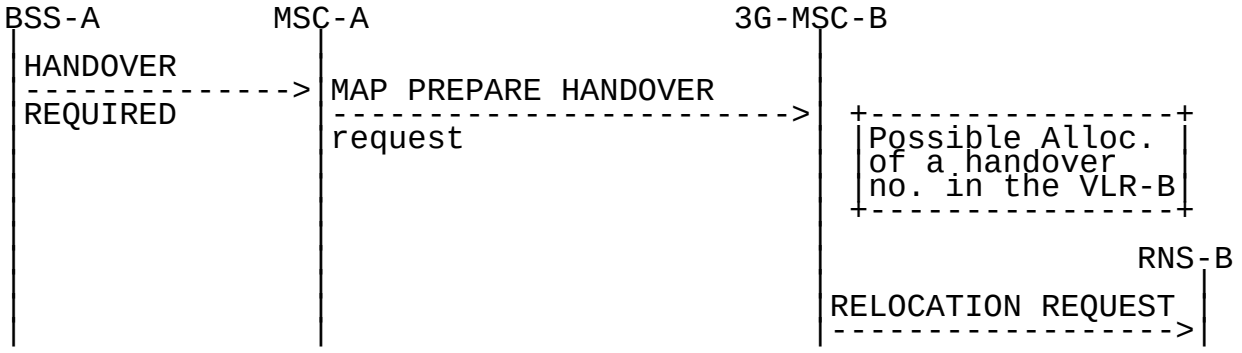


Figure 37a: Signalling for Basic Inter-MSC Handover initiation (no trace related messages transferred)

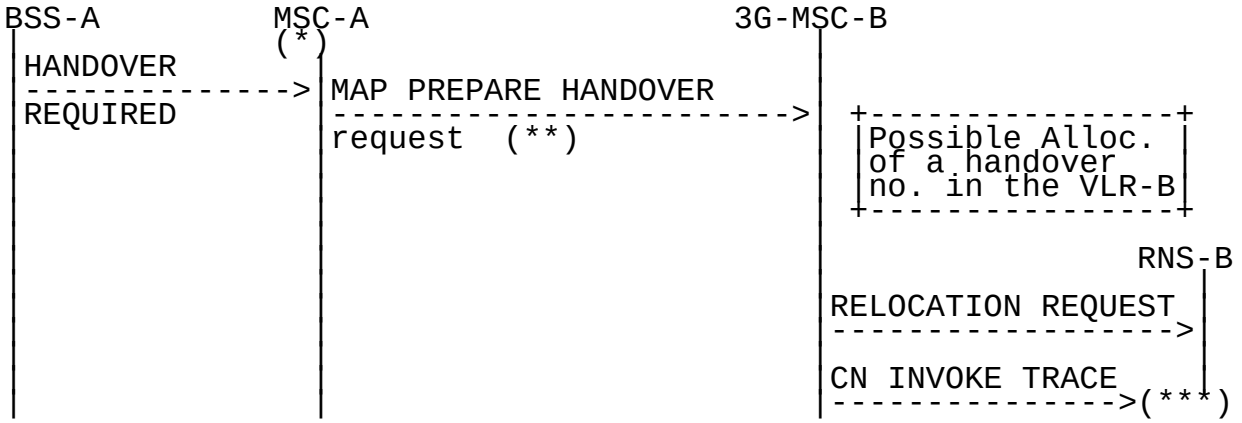


Figure 37b: Signalling for Basic Inter-MSC Handover initiation (CN invoke trace message transferred)

(*): Tracing invocation has been received from VLR.

(**): In that case, HANDOVER REQUEST and MSC INVOKE TRACE messages are included within the AN-apdu parameter.

(***): CN INVOKE TRACE is forwarded to RNS-B if supported by 3G_MSC-B.

Possible Positive outcomes: successful radio resources allocation and handover number allocation (if performed):

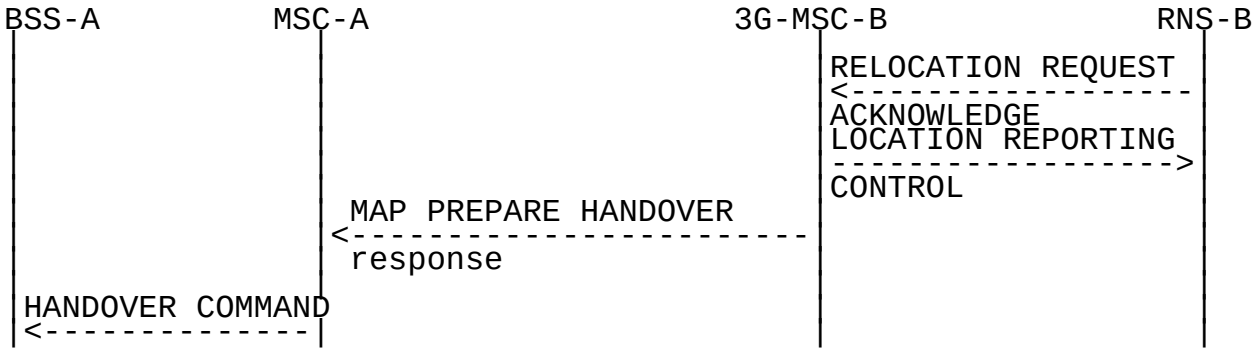
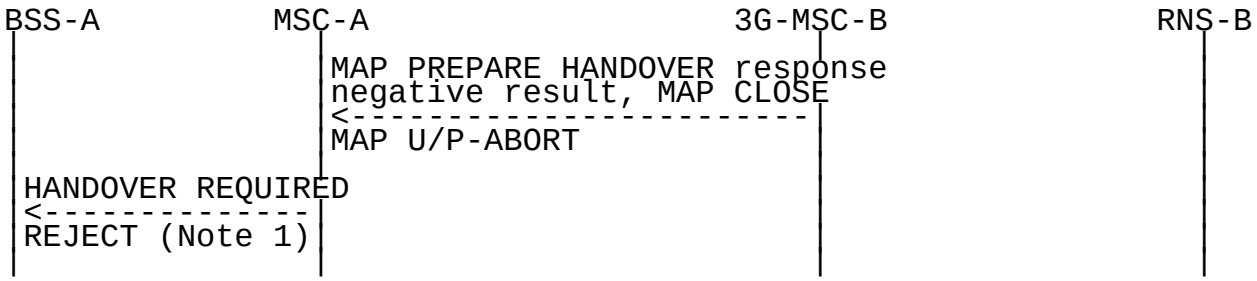


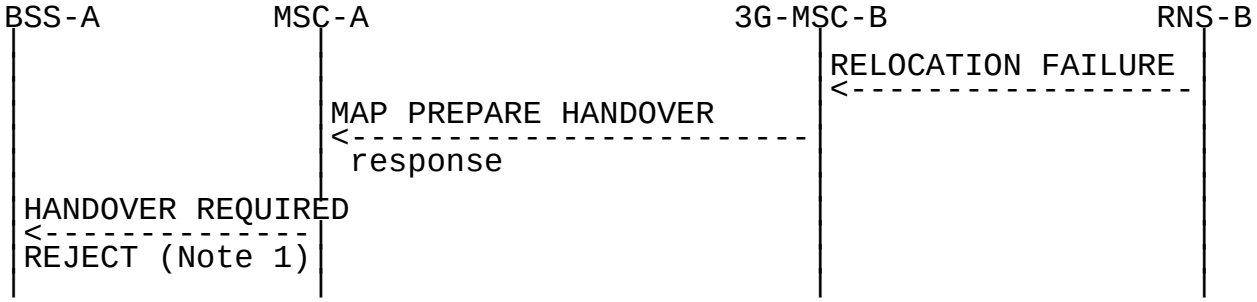
Figure 38: Signalling for Basic Inter-MSC Handover execution (Positive outcome)

Possible Negative outcomes:

a) user error detected, or handover number allocation unsuccessful (if performed), or component rejection or dialogue abortion performed by 3G_MSC-B:



b) radio resources allocation failure:



c) unsuccessful handover execution (Reversion to the old radio resources):

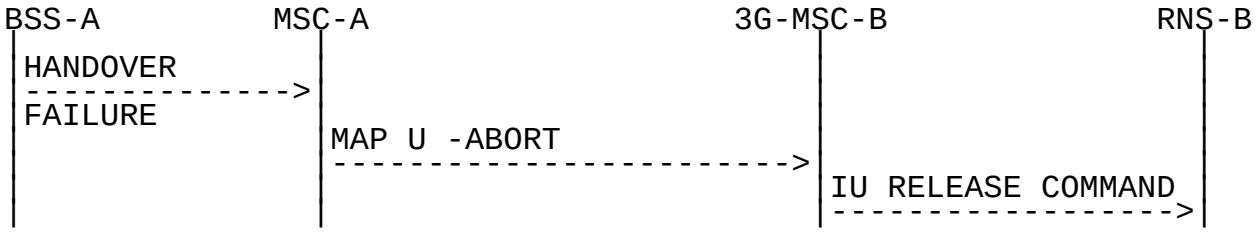


Figure 39: Signalling for Basic Inter-MSC Handover execution (Negative outcomes)

NOTE 1: Possible rejection of the handover because of the negative outcome of MAP or RANAP procedure.

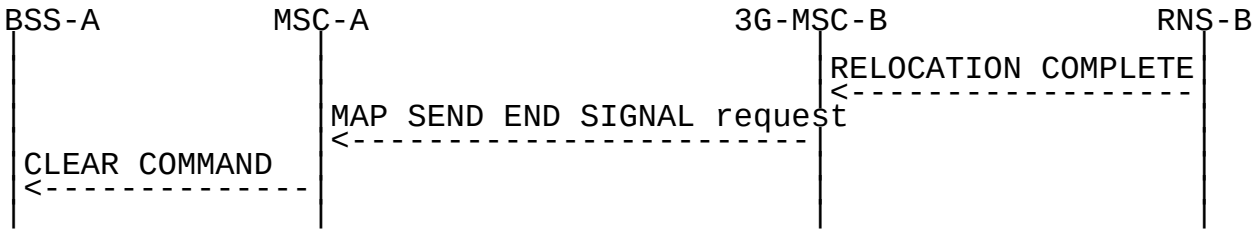


Figure 40: Signalling for Basic Inter-MSC Handover completion

Positive outcome:

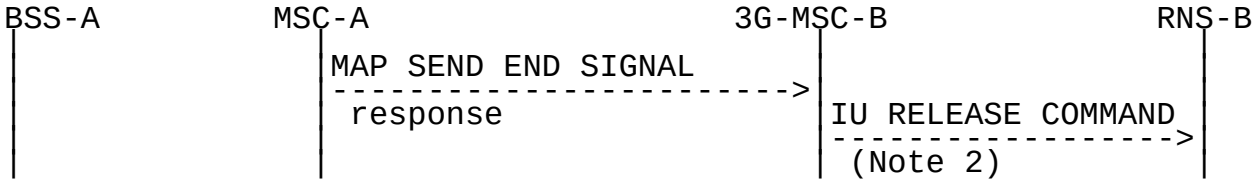


Figure 41: Signalling for Basic Inter-MSC Handover completion (Positive outcome)

Negative outcome:

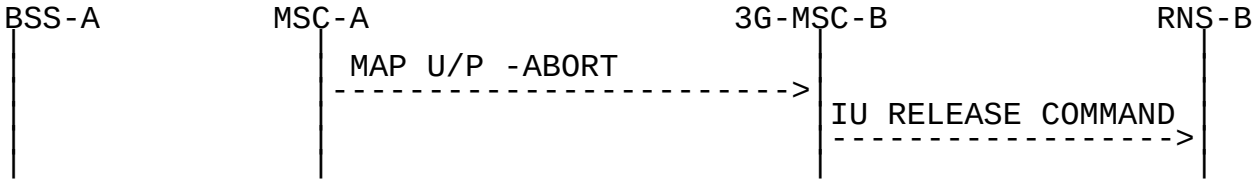


Figure 42: Signalling for Basic Inter-MSC Handover completion (Negative outcome)

NOTE 2: From interworking between MAP and RANAP point of view, when the call is released.

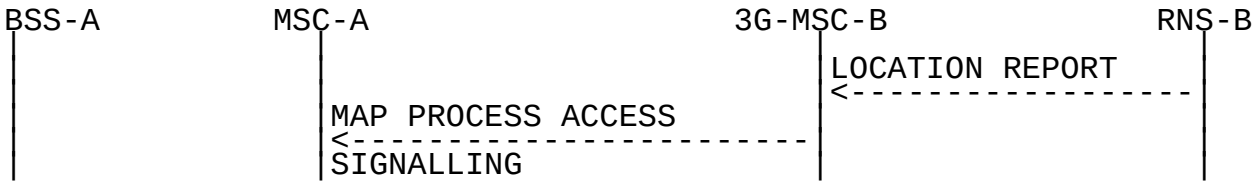


Figure 42a: Signalling for updating of anchor MSC after change of location in RNS

The handover procedure is normally triggered by BSS-A by sending a HANDOVER REQUIRED message on A-Interface to MSC-A. The invocation of the Basic Inter-MSC handover procedure is performed and controlled by MSC-A. The sending of the MAP Prepare-Handover request to 3G_MSC-B is triggered in MSC-A upon receipt of the HANDOVER REQUIRED message. The identity of the target RNC where the call is to be handed over in 3G_MSC-B area, provided in the HANDOVER REQUIRED message in the information element Cell Identifier List (Preferred), is mapped to the target RNC Id MAP parameter and the HANDOVER REQUEST message is encapsulated in the an-APDU MAP parameter of the Prepare-Handover MAP request. 3G_MSC-B can invoke another operation towards the VLR-B (allocation of the handover number described in 3GPP TS 29.002).

Additionally, if tracing activity has been invoked, the trace related message can be transferred on the E-Interface encapsulated in the an-APDU MAP parameter of the Prepare-Handover Request. If transferred, one complete trace related message at a time shall be included in the an-APDU MAP parameter after the HANDOVER REQUEST message. Note: UMTS supports only CN initiated tracing.

The interworking between Prepare Handover and HANDOVER REQUIRED is as follows:

	048.008	29.002	Notes
Forward message	HANDOVER REQUIRED BSSMAP information elements	MAP PREPARE HANDOVER request -ho-NumberNotRequired -target RNC Id -IMSI -Integrity protection info -Encryption info -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE)	1 2 3 4
Positive result		MAP PREPARE HANDOVER response -handover number -an-APDU(HANDOVER REQUEST ACKNOWLEDGE or HANDOVER FAILURE)	5
Negative result	HANDOVER REQUIRED REJECT equipment failure equipment failure equipment failure equipment failure equipment failure equipment failure	MAP PREPARE HANDOVER System Failure No Handover Number available UnexpectedDataValue Data Missing MAP CLOSE MAP U/P -ABORT	6

NOTE 1: The ho-NumberNotRequired parameter is included by MSC-A, when MSC-A decides not to use any circuit connection with 3G_MSC-B. No handover number shall be present in the positive result. Any negative response from 3G_MSC-B shall not be due to handover number allocation problem.

NOTE 2: Integrity protection information, encryption information and IMSI parameters are included by MSC-A, only when the MSC-A uses 29.002 as per release 99. These IEs are not included if the MSC-A is R98 or earlier.

NOTE 3: The process performed on the BSSMAP information elements received in the HANDOVER REQUIRED message is described in the 3GPP TS ~~GSM Recommendation 04~~8.0~~0~~8.

NOTE 4: The process performed on the BSSMAP information elements received in the MSC INVOKE TRACE message is described in subclause 4.5.5.6.

NOTE 5: The response to the Prepare-Handover request can include in its an-APDU parameter, identifying the GSM 08.06 protocol, either a BSSMAP HANDOVER REQUEST ACKNOWLEDGE or a BSSMAP HANDOVER FAILURE.

In the first case, the positive result triggers in MSC-A the sending on A-Interface of the HANDOVER COMMAND.

In the second case, the positive result triggers in MSC-A optionally the sending of the HANDOVER REQUIRED REJECT.

(The possible sending of the HANDOVER REQUIRED REJECT message upon receipt of the HANDOVER FAILURE is out of the scope of 3GPP TS 29.010 and lies in 3GPP TS 48.008).

NOTE 6: The possible sending of the HANDOVER REQUIRED REJECT message is described in 3GPP TS 48.008.

The interworking between Prepare Handover and RELOCATION REQUEST in 3G_MSC-B is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -ho-NumberNotRequired -target RNC Id -IMSI -Integrity protection info -Encryption info -RANAP service handover -SNA Access Information ~~SNA Access Information~~ -an-APDU(HANDOVER REQUEST, MSC INVOKE TRACE) BSSMAP information elements: Channel Type Cause sRNC to tRNC container	RELOCATION REQUEST RANAP information elements: RAB parameters Cause sRNC to tRNC container info stored/generated in/by 3G_MSC-B: CN domain indicator SNA Access Information	1 2
Positive result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER REQUEST ACK) BSSMAP information elements: Layer 3 info	RELOCATION REQUEST ACK RANAP information elements: tRNC to sRNC container	
Negative result	MAP PREPARE HANDOVER response -an-APDU(HANDOVER FAILURE)	RELOCATION FAILURE	

NOTE 1: Integrity protection information, encryption information, IMSI and RANAP service handover parameters are included by MSC-A, only when the MSC-A uses 29.002 as per release 99. These IEs are not included if the MSC-A is R98 or earlier.

NOTE 2: SNA Access Information parameter is included by MSC-A, only when the MSC-A uses 29.002 as per release 5. These IEs are not included if the MSC-A is release 4 or earlier.

The interworking between Send End Signal and RELOCATION COMPLETE in 3G_MSC-B is as follows:

	25.413	29.002	Notes
Forward message	RELOCATION COMPLETE	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	
Positive result	IU RELEASE COMMAND -Normal release	MAP SEND END SIGNAL response	1
Negative result	IU RELEASE COMMAND -Normal release -Normal release	MAP CLOSE MAP U/P -ABORT	2

NOTE 1: The positive empty result triggers the clearing of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B. If a circuit connection is used between MSC-A and 3G_MSC-B, the 'Normal release' clearing cause shall only be given to RNS-B when 3G_MSC-B has received a clearing indication on its circuit connection with MSC-A.

NOTE 2: The abortion of the dialogue or the rejection of the component triggers in 3G_MSC-B the clearing of its circuit connection with MSC-A, if any, of the Radio Resources on the Iu-Interface and the release of the SCCP connection between 3G_MSC-B and RNS-B.

The interworking between Send End Signal and CLEAR COMMAND in MSC-A is as follows:

	29.002	~~0~~4~~0~~8.~~0~~08	Notes
Forward message	MAP SEND END SIGNAL request -an-APDU(HANDOVER COMPLETE)	CLEAR COMMAND - Handover Successful	
Positive result			
Negative result			

The interworking between HANDOVER FAILURE in case of reversion to old channel of the MS and User Abort in MSC-A is as follows:

	~~08.08~~48.008	29.002	Notes
Forward message	HANDOVER FAILURE - Reversion to old channel	MAP U -ABORT	
Positive result			
Negative result			

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

4.7.4 BSSAP Messages transfer on E-Interface

The handling is described in chapter 4.5.4, additional cases are described in this chapter.

4.7.4.1 Assignment

The interworking between the BSSMAP assignment messages in MAP and the RANAP RAB assignment messages is as follows:

	29.002	25.413	Notes
Forward message	MAP PREPARE HANDOVER request -RANAP service handover -SNA Access Information -an-APDU(ASSIGNMENT REQUEST) BSSMAP information elements: Channel Type	RAB ASSIGNMENT REQ Service handover SNA Access Information RANAP information elements: RAB parameters	
Positive result	MAP PREPARE HANDOVER request -an-APDU(ASSIGNMENT COMPLETE or ASSIGNMENT FAILURE) BSSMAP information elements: Cause	RAB ASSIGNMENT RESPONSE (positive result) RAB ASSIGNMENT RESPONSE (negative result) RANAP information elements: Cause	1
Negative result		MAP U/P –ABORT	

****** NEXT ADDED SECTION ******

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

…

4.7.5.10 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 Prepare Handover Request MAP message .

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

4.8 Inter-MSC Relocation

…..

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

…..

4.8.5.10 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 rRequest MAP message.

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

3GPP TSG-CN4 Meeting #15 ***Tdoc N4-021082***
Helsinki, Finland, 29 July – 2 August

3GPP TSG-CN1 Meeting #25 ***Tdoc N1-021789***
Helsinki, Finland, 29 July – 2 August ~~*Tdoc N1-021535*~~

CR-Form-v7

CHANGE REQUEST

⌘ **23.009** **CR** **080** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Support for Shared Network Area
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	2002-07-30
Category:	⌘	**B**
Release:	⌘	REL-5

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:

2	*(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)*

Reason for change:	⌘	RAN WG3 #30 agreed on a final solution for the support of Shared Networks in connected mode in Release 5. Please see LS N1-021535 and the TR R3:012 included. The agreed solution is based on the concept of SNA which is basically a collection of Location Areas. A set of allowed SNAs is associated to each IMSI serie. The set of allowed SNAs, the Shared Network Area (SNA) information is signalled to the radio access network at the call set up to allow the radio access network decide which Location Area the subscriber may be handed over to at a later point.
Summary of change:	⌘	SNA information resides in the CN and is transferred to the radio access network via the Iu interface where it is used for selection of the target cell for handover. During the inter-MSC handover, the SNA information is sent from the anchor to the non-anchor and passed to the radio access network by the non-anchor. For emergency calls, SNA information does not apply. This CR specifies handling of the SNA information with respect to the handover/relocation.
Consequences if not approved:	⌘	Correct target for handover could not be selected for Shared Networks.

Clauses affected:	⌘	3.1, 4.3.1, 4.4.1

		Y	N			
Other specs	⌘	**X**		Other core specifications	⌘	22.129, 25.413, 25.401, 25.423, 29.002, 23.003, 29.010
affected:				Test specifications		
				O&M Specifications		

Other comments:	⌘	This CR was once presented at CN1#24 (N1-021430) for conditional approval. Since RAN WG3 could not reach to an agreement by the end of the CN1 meeting, the CR was withdrawn. In this revision the terminology is aligned with those used in other specifications, i.e. “SNA” is used instead of “access rights”. Reference to TS 25.401 where SNA is briefly described is also added.

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

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

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

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

********** FIRST MODIFICATION **********

2 References

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

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

[1] ITU-T Recommendation Q.118: "Abnormal conditions - Special release arrangements".

[2] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2a] 3GPP TS 21.905: "3G Vocabulary".

[3] 3GPP TS 03.68: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS); Stage 2".

[4] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio Subsystem Link Control".

[5] 3GPP TS 48.008: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC-BSS) Interface Layer 3 specification".

[6] 3GPP TS 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controler - Base Transceiver Station (BSC-BTS) Interface Layer 3 specification".

[7] 3GPP TS 09.08: "Digital cellular telecommunications system (Phase 2+); Application of the Base Station System Application Part (BSSAP) on the E-interface".

[8] 3GPP TS 29.010: "Information Element Mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS-MSC); Signalling procedures and the Mobile Application Part (MAP)".

[9] 3GPP TS 22.129: "Handover Requirements between UMTS and GSM or other Radio Systems".

[10] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[11] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[12] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[13] 3GPP TS 25.303: "UE functions and inter-layer procedures in connected mode".

[14] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[15] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

[16] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[17] 3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes".

[19] 3GPP TS 23.221: "Architectural Requirements".

[20] 3GPP TS 25.401: "UTRAN Overall Description".

********** NEXT MODIFICATION **********

3.1 Abbreviations

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

3G_MSC	A third generation MSC that supports the Iu interface and optionally the A interface
3G_MSC-A	The controlling 3G_MSC on which the call was originally established
3G_MSC-B	The 3G_MSC to which the UE is handed over in a Basic Handover
3G_MSC-B'	The 3G_MSC to which the UE is handed over in a Subsequent Handover
BSC	Base Station Controller
BSS	Base Station System
BSS-A	The BSS from which the MS is being handed over
BSS-B	The BSS to which the MS is being handed over
BTS	Base Transceiver Station
GERAN	GSM EDGE Radio Access Network
ISC	International Switching Centre
MS	Mobile Station
MSC	A second generation Mobile Services Switching Centre that only supports the A interface
MSC-A	The controlling MSC on which the call was originally established
MSC-B	The MSC to which the MS is handed over in a Basic Handover
MSC-B'	The MSC to which the MS is handed over in a Subsequent Handover
RNC	Radio Network Controller
RNS	Radio Network Subsystem
SBSS	Serving BSS
SNA	Shared Network Area
SRNS	Serving RNS
UE	A User Equipment is a terminal that supports USIM and the UMTS Uu interface
UE/MS	A terminal that supports USIM, SIM, the Uu interface and the Um interface
USIM	UMTS Subscriber Identity Module

Other abbreviations used in the GSM specifications are listed in 3GPP TS 01.04 [2] and 3GPP TS 21.905[2a].

********** NEXT MODIFICATION **********

4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP or BSSMAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In a network implementing the "Flexible Iu interface for handover/relocation" option, 3G_MSC-A may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-A can have multiple target CN nodes for each handover/relocation target in a pool-area as specified in 3GPP TS 23.236 [18].

In the case of intra-MSC handover of a speech call, 3G_MSC-A controls the transcoder in the core network. The 3G_MSC-A determines if a transcoder is required to be inserted or released in the CN.

In the case of Inter-3G_MSC relocation, 3G_MSC-A links out the transcoder.

In the Inter-3G_MSC relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE during the call, before, during and after a basic or subsequent relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - RNS interface for the RANAP procedures. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE.

During a successful relocation the order to perform location reporting at change of Service Area is not transferred to the target RNS. In the Intra-3G_MSC-A relocation case, the 3G_MSC-A re-issues the Location Reporting Control towards the target RNS. In the Inter-3G_MSC relocation case, 3G_MSC-A keeps the control of the Location Report Control procedure. However, re-issuing the Iu-LOCATION-REPORTING-CONTROL messages due to subsequent Intra-3G_MSC-B relocations is the responsibility of 3G_MSC-B.

During a basic relocation, 3G_MSC-A initiates and controls all the relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation Cancel from RNS-A).

During a subsequent relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic relocation paragraph and towards 3G_MSC-B as described above in subsequent relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in 3GPP TS 09 08 [7] are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system UMTS to GSM handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system UMTS to GSM handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation Cancel from RNS-A).

During a subsequent inter-system UMTS to GSM handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

During a basic inter-system GSM to UMTS handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system GSM to UMTS handover back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Handover Failure from BSS-A).

During a subsequent inter-system GSM to UMTS handover to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards MSC-B as described above in subsequent inter-system handover paragraph.

3G_MSC-A may assign a priority level defined as RAB parameter in 3GPP TS 25.413 [11] for each bearer. In case of relocation of a multicall configuration the 3G_MSC-B or the target RNC shall select the bearers to be handed over according to the priority level, if the target cell is not able to accommodate all bearers. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) 3G MSC-A shall send the SNA information to 3G_MSC-B except for emergency calls.

If 3G_MSC-A supports the optional supplementary service Multicall (See 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the Intra-3G_MSC relocation case, the 3G-MSC-A tries to relocate all bearers to a new RNS.
- In the basic relocation case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B. If 3G_MSC-A receives an indication that the 3G_MSC-B does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the subsequent relocation to a third 3G_MSC-B' case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B'. If 3G_MSC-A receives an indication that the 3G_MSC-B' does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries again to relocate the selected bearer.
- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the basic inter-system UMTS to GSM handover case, the 3G_MSC-A shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.
- In all cases described above, 3G_MSC-A shall release some calls which has been carried by the bearers failed to set up in new RNS or the bearers not to be handed over.

********** NEXT MODIFICATION **********

4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure. 3G_MSC-B notifies MSC-A or 3G_MSC-A of intra-3G_MSC-B InterSystem handover and intra GSM handovers, by using the A-HANDOVER-PERFORMED message.

In case of intra-3G_MSC-B SRNS relocation, if security algorithms have been changed:

a) When encapsulated BSSAP is used on the E interface, the A-HANDOVER-PERFORMED message shall be sent.

b) When encapsulated RANAP is used on the E interface, the Iu-LOCATION-REPORT message shall be sent.

On reception of an order to perform location reporting at change of Service Area from 3G_MSC-A, 3G_MSC-B shall be responsible to re-issue the Iu-LOCATION-REPORTING-CONTROL message after subsequent Intra-3G_MSC-B relocations/handovers. This shall be performed immediately after the successful completion of the Relocation Resource Allocation procedure.

In both cases, the selected UMTS algorithm(s) shall be indicated in the MAP-PROCESS-ACCESS-SIGNALLING request.

In a network implementing the "Flexible Iu interface for handover/relocation" option, in the Intra-3G_MSC handover/relocation case, 3G_MSC-B may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For subsequent inter-MSC handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-B can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

The role of 3G_MSC-B is also to provide transcoder resources.

In the Inter-3G_MSC relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the BSSMAP information received on the A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its BSSs to the extent that 3G_MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between 3G_MSC-B and BSS-B is under the responsibility of 3G_MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

At intra-PLMN handover/relocation, 3G_MSC-B shall send Service Handover related information to the BSC/RNC if and only if this Service Handover information is received from 3G_MSC-A. 3G_MSC-B shall not modify Service Handover related information received from a 3G_MSC-A within the same PLMN.

For network sharing (see 3GPP TS 25.401 [20], subclause 7.2.3) when SNA information is received by 3G_MSC-B from 3G_MSC-A, 3G MSC-B shall send the SNA information to the RNS.

If 3G_MSC-B does not support the optional supplementary service Mutlicall (see 3GPP TS 23.135) and 3G_MSC-A requests to relocate multiple bearers, 3G_MSC-B shall indicate that it does not support multiple bearers to 3G_MSC-A.

If 3G_MSC-B supports the optional supplementary service Multicall (see 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the basic relocation case, the 3G_MSC-B shall be able to allocate a Handover Number for each bearer. The 3G_MSC-B shall also be able to select some bearers to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] so that the number of bearers will fulfill the maximum number of bearers supported by the 3G_MSC-B. If a selection has to be made between bearers of the same priority level, then the selection criteria are implementation dependent.

- In the Intra-3G_MSC relocation case, the 3G_MSC-B tries to relocate all bearers to a new RNS.

- In the subsequent relocation back to the 3G_MSC-A or to a third 3G_MSC-B' case, the 3G_MSC-B tries to request to the 3G_MSC-A to relocate all bearers to the 3G_MSC-A or to the 3G_MSC-B'.

- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the subsequent inter-system UMTS to GSM handover back to the 3G_MSC-A or to a third MSC-B' case, the 3G_MSC-B shall be able to select one bearer to be handed over according to 3GPP TS 22.129 [9] and tries to handover the selected bearer.

3GPP TSG CN WG4 Meeting #15 **N4-021101**
Helsinki, Finland, 29th July – 2nd August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.003** **CR** **050** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

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

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

Title:	⌘	Support for Shared Network in connected mode: definition of SNA
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	09/07/2002
Category:	⌘	**B**
Release:	⌘	REL-5

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:

2	*(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)*

Reason for change:	⌘	RAN#3 has agreed on a solution for the support of Shared Networks in connected mode in Release 5. See TR R3:012 available in LS N4-020865 (R3-021816). The agreed solution is based on the concept of SNA, which is basically a collection of Location Areas. A set of allowed SNA's is associated to each IMSI serie. The set of allowed SNA's, the SNA Access Information, is signalled to the Radio Network when a call is setup, so that the Radio Network can decide whether a subscriber can be handed over when moving to a new Location Area, i.e. if he has authorization to get service in that Location Area. During the Handover procedure the anchor MSC has to inform the non-anchor MSC about the SNA Access Information of the subscriber so that non-anchor MSC shall be able to forward this information to the Radio Network when performing subsequent intra-MSC handovers.
Summary of change:	⌘	The concept and format of Shared Network Area is defined
Consequences if not approved:	⌘	The concept of SNA would be used in other TS's without a proper defintion

Clauses affected:	⌘	12, 12.6

Y N

Other specs	⌘	**X**	Other core specifications	⌘	29.002 CR 466 29.010 CR 058 23.009 CR 080
affected:		**X**	Test specifications		
		X	O&M Specifications		
Other comments:	⌘	The notation for the concatenation operator has been changed throughout section 12 from “+” to “||”			

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

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

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

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

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

12 Identification of PLMN, RNC, Service Area, CN domain, Shared Network Area

The following clauses describe identifiers that are used by both CN and UTRAN across the Iu interface. For identifiers that are solely used within UTRAN, see 3GPP TS 25.401.

NOTE: in the following, the double vertical bar notation || indicates the concatenation operator.

12.1 PLMN Identifier

A Public Land Mobile Network is uniquely identified by its PLMN identifier. PLMN-Id is made of Mobile Country Code (MCC) and Mobile Network Code (MNC).

- **PLMN-Id = MCC || MNC**

The MCC and MNC are predefined within a UTRAN, and set in the RNC via O&M.

12.2 CN Domain Identifier

A CN Domain Edge Node is identified within UTRAN by its CN Domain Identifier. The CN Domain identifier is used over UTRAN interfaces to identify a particular CN Domain Edge Node for relocation purposes. The CN Domain identifier for Circuit Switching (CS) is made of the PLMN-Id and the LAC, whereas for Packet Switching (PS) it is made of the PLMN-Id, the LAC, and the RAC of the first accessed cell in the target RNS.

The two following CN Domains Identifiers are defined:

- **CN CS Domain-Id = PLMN-Id || LAC**
- **CN PS Domain-Id = PLMN-Id || LAC || RAC**

The LAC and RAC are defined by the operator, and set in the RNC via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

12.3 CN Identifier

A CN node is uniquely identified within a PLMN by its CN Identifier (CN-Id). CN-Id together with the PLMN identifier is used to globally identify the CN node. CN-Id together with the PLMN-Id is used as CN node identifier in RANAP signalling over the Iu interface.

Global CN-Id = PLMN-Id || CN-Id

The CN-Id is defined by the operator, and set in the nodes via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

12.4 RNC Identifier

An RNC node is uniquely identified within UTRAN by its RNC Identifier (RNC-Id). RNC-Id together with the PLMN identifier is used to globally identify the RNC. RNC-Id or the RNC-Id together with the PLMN-Id is used as RNC

identifier in UTRAN Iub, Iur and Iu interfaces. SRNC-Id is the RNC-Id of the SRNC. C-RNC-Id is the RNC-Id of the controlling RNC. D-RNC-Id is the RNC Id of the drift RNC.

- **Global RNC-Id = PLMN-Id ~~|~~|+ RNC-Id**

The RNC-Id is defined by the operator, and set in the RNC via O&M

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

12.5 Service Area Identifier

The Service Area Identifier (SAI) is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN.

The Service Area Code (SAC) together with the PLMN-Id and the LAC will constitute the Service Area Identifier.

- **SAI = PLMN-Id ~~|~~|+ LAC ~~|~~|+ SAC**

The SAC is defined by the operator, and set in the RNC via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413. 3GPP TS 25.423 and 3GPP TS 25.419 define the usage of this identifier in RNSAP and SABP signalling.

A cell may belong to one or two Service Areas. In the case that it belongs to two Service Areas, one is applicable in the BC domain and the other is applicable in both the CS and PS domains.

The broadcast (BC) domain requires that Service Area consist of one cell. This does not limit the usage of Service Area for other domains. Refer to 3GPP TS 25.410 for a definition of the BC domain.

12.6 Shared Network Area Identifier

The Shared Network Area Identifier (SNA-Id) is used to identify an area consisting of one or more Location Areas. Such an area is called a Shared Network Area and can be used to grant access rights to parts of a Shared Network to a UE in connected mode (see 3GPP TS 25.401).

The Shared Network Area Identifier consists of the PLMN-Id followed by the Shared Network Area Code (SNAC).

- **SNA-Id = PLMN-Id ~~|~~|+ SNAC**

The SNAC is defined by the operator.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

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