Technical Specification Group Services and System Aspects ***TSGS#16(02)0313***

Meeting #16, Marco Island, USA, 10-13 June 2002

Source: **TSG SA WG2**
Title: **CRs on 23.121 and 23.221**
Agenda Item: **7.2.3**

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #16.
Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

S2 Tdoc #	Spec	CR #	rev	Rel	Title	cat	V in	V out	WI
S2-021510	23.121	64	2	R99	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection	F	3.5.0	3.6.0	TEI
S2-021511	23.221	31	2	Rel-4	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection	A	4.1.0	4.2.0	TEI4
S2-021512	23.221	32	2	Rel-5	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection	A	5.4.0	5.5.0	TEI5
S2-021300	23.221	33		Rel-5	CR related to the discussion in S2-021074.	F	5.4.0	5.5.0	IMS-CCR

3GPP TSG-SA2 Meeting #24
Madrid, Spain, 22-26.3.2002

S2-021300

CR-Form-v5

CHANGE REQUEST

⌘ **23.221** **CR** **33** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

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

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

Title:	⌘	SIP compression
Source:	⌘	Nokia
Work item code:	⌘	IMS-CCR
Date:	⌘	22.04.2002
Category:	⌘	**F**
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)

Reason for change:	⌘	CN1 informed that CN1 does not see a need for negotiation and the standardization of a default compression algorithm because the UDVM approach has been selected (S2-021074).
Summary of change:	⌘	The requirement for default compression algorithm is removed.
Consequences if not approved:	⌘	Inconsistent specifications

Clauses affected:	⌘	2, 9		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	24.229
Other comments:	⌘			

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

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

2 References

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

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[1] 3GPP TS 23.002: "Network Architecture".

[2] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[3] 3GPP TS 23.012: " Location management procedures"

[5] 3GPP TS 25.331: " Radio Resource Control (RRC) Protocol Specification"

[6] 3G TS 25.301: "Radio interface protocol architecture"

[7] 3G TS 25.303: "UE functions and inter-layer procedures in connected mode"

[8] 3GPP TR 21.905: "3G Vocabulary".

[9] 3GPP TS 25.413: " UTRAN Iu interface RANAP signalling"

[10] 3GPP TS 25.410: " UTRAN Iu Interface: General Aspects and Principles"

[11] 3G TS 23.228 "IP Multimedia Subsystem – Stage 2"

[12] 3G TS 43.051 "GERAN Overall Description"

[13] 3G TS 23.153 ,"Out of Band Transcoder Control - Stage 2".

[14] 3G TS 23.205, "Bearer Independent CS Core Network – Stage 2"

[15] 3G TR 25.931: " UTRAN Functions, examples on signalling procedures"

[16] RFC2766 "Network Address Translation - Protocol Translation (NAT-PT)", G. Tsirtsis, P. Srisuresh. February 2000.

[17] RFC2893 "Transition Mechanisms for IPv6 Hosts and Routers", R. Gilligan, E. Nordmark, August 2000.

[17a] RFC 3041: "Privacy Extensions for Stateless Address Autoconfiguration in IPv6", T. Narten, R. Daves, January 2001.

[18] 3G TS 25.401 "UTRAN Overall Description"

[19] 3G TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[20] 3G TS 45.008: "Radio subsystem link control"

[21] draft-manyfolks-ipv6-cellular-host-02.txt: ”Minimum IPv6 Functionality for a Cellular Host”, Work in progress

[22] 3G TS 24.229 “IP Multimedia Call Control Protocol based on SIP and SDP”

*** NEXT MODIFICATION ***

9 Efficient use of radio resource

This clause captures the technical requirements to ensure efficient use of the radio resource in the UMTS access network. The radio resource is considered to be a scarce resource and therefore every opportunity shall be taken to optimize its use.

It shall be possible to re-apply PS domain pre-release 5 mechanisms for efficient use of radio resource.

Additional requirements for efficient use of the radio spectrum for release 5 SIP signalling include the following:

- UMTS shall support mechanisms to optimize transport of SIP signaling packets over the radio interface, typically by compressing the SIP signaling messages and by compressing the IP and transport layer protocol headers that carry these SIP messages.
- The chosen solution(s) shall be extensible to facilitate the incorporation of new and improved compression algorithms in a backward compatible way as they become available.
- The chosen solution(s) should work in roaming scenarios.
- Application specific compression shall minimize impacts on existing UMTS release e.g. it could be defined between the UE and associated application server, e.g. at the SIP Client and at the first SIP Proxy.

Support of sip signaling compression ~~and negotiation~~ is mandatory in the UE and P-CSCF for IMS. The actual usage of compression is optional but highly preferable and is subject to operator policies. ~~However, if SIP signalling compression is used, a default algorithm shall be supported by the UE and the network elements involved in compression. The actual negotiation mechanism and default compression algorithm is subject for stage 3 decision.~~ See 24.229 for more details [22].

~~Editor’s NOTE: The location of the compression/decompression for each application is for further study.~~

3GPP TSG-SA2 Meeting #24 *Tdoc S2-021512*
Madrid, Spain, April 22-26, 2002 **rev of S2-021333**

CR-Form-v4

CHANGE REQUEST

⌘ **23.221** **CR** **32** rev⌘ **2** ⌘ Current version: 5.4.0 ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [**NO**] Access Network [**X**] Core Network [**NO**]

Title:	⌘	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection
Source:	⌘	Vodafone Ltd.
Work item code:	⌘	TEI
Date:	⌘	26/4/02
Category:	⌘	**A**
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)*
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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)

Reason for change:	⌘	The CS domain expects reliable message delivery. However this does not seem to be documented anywhere and could lead to manufacturers believing that the Cell FACH state is a suitable state in which to transfer CS domain signalling message. In addition, the requirements for handling CS domain signalling during handover do not seem to have been documented. The intention of this CR is to ensure that changes are NOT needed to the UE or to the MSC. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.
Summary of change:	⌘	The CS domain signalling requirements are added in a new section.
Consequences if not approved:	⌘	Use of the Cell FACH state could lead to high call failure rates, and, the associated behaviour for the mobile is undefined. MSC or RNC functionality that is not complaint to the behaviour described in this CR could lead to high call failure rates. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.

Clauses affected:	⌘	Section 2 and a new section, 6.11a, is added.
Other specs	⌘ [ ]	Other core specifications ⌘

Affected:	☐ Test specifications ☐ O&M Specifications	
Other comments:	⌘	

1 Scope

This document covers details the architectural requirements for the GSM in Iu mode and UMTS systems. In particular it details the high level requirements for the Circuit Switched (CS) Domain and the stage 2 procedures that span more than one domain/subsystem within UMTS and GSM. The reference model to which these procedures apply can be found within 3G TS 23.002 [1]. In addition, A mode to Iu mode handover for CS services is addressed. Detailed architectural requirements within the subsystems are contained within the remainder of the 23 series of specifications e.g. the requirements for the Packet Switched (PS) domain are contained within 3G TS 23.060 [2] and the requirements for the Bearer Independent CS Core Network are contained in 3G TS 23.205[14].

2 References

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

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[1] 3GPP TS 23.002: "Network Architecture".

[2] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[3] 3GPP TS 23.012: “ Location management procedures”

[5] 3GPP TS 25.331: “ Radio Resource Control (RRC) Protocol Specification”

[6] 3G TS 25.301: “Radio interface protocol architecture”

[7] 3G TS 25.303: “UE functions and inter-layer procedures in connected mode”

[8] 3GPP TR 21.905: "3G Vocabulary".

[9] 3GPP TS 25.413: “ UTRAN Iu interface RANAP signalling”

[10] 3GPP TS 25.410: “ UTRAN Iu Interface: General Aspects and Principles”

[11] 3G TS 23.228 “IP Multimedia Subsystem – Stage 2”

[12] 3G TS 43.051 “GERAN Overall Description”

[13] 3G TS 23.153 ,"Out of Band Transcoder Control - Stage 2".

[14] 3G TS 23.205, “Bearer Independent CS Core Network – Stage 2”

[15] 3G TR 25.931: “ UTRAN Functions, examples on signalling procedures”

[16] RFC2766 "Network Address Translation - Protocol Translation (NAT-PT)", G. Tsirtsis, P. Srisuresh. February 2000.

[17] RFC2893 ”Transition Mechanisms for IPv6 Hosts and Routers”, R. Gilligan, E. Nordmark, August 2000.

[18] 3G TS 25.401 ”UTRAN Overall Description”

[19] 3G TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[20] 3G TS 45.008: "Radio subsystem link control"

[21] draft-manyfolks-ipv6-cellular-host-02.txt: ”Minimum IPv6 Functionality for a Cellular Host”, Work in progress

Editor's Note: The above reference will need to be updated to reference the assigned RFC number, once the draft achieves RFC status within the IETF.

[22] 3GPP TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

6.11 Signalling connection establishment

A signalling connection between the UE and a CN node refers here to a logical connection consisting of an RRC connection between UE and the RAN and an Iu signalling connection between the RAN and the CN node. The signalling connection is used for transfer of higher layer (MM, CM) information between the UE and the CN node.

At a CM service request to one of the CN domain types and when no such connection exists towards the applicable CN domain type, the UE shall request establishment of a new signalling connection.

If no RRC connection exists, this is established in conjugation with (before) the transfer of the signalling establishment request. At the RRC connection establishment, an UE context is built up in the SRNC.

If an RRC connection is already established, the UE shall send the signalling establishment request using that RRC connection.

At reception of the signalling establishment request, the SRNC will establish an Iu connection towards the CN node indicated by the CN service domain type received from UE.

6.11a CS Domain Signalling Requirements (in particular relating to handover)

Correct operation of the Call Control, Mobility Management and Call Independent Supplementary Service protocols requires that downlink messages from the MSC shall not be lost, duplicated or delivered in error.

The RAN and Iu/A interfaces shall provide this functionality in all cases except for when the Iu/A interface SCCP connection is being changed, eg at SRNS relocation or inter-BSC (external) handover.

When the SCCP connection is being changed, the MSC shall buffer downlink CC, MM and CISS messages. Specifically, the MSC shall buffer messages from these protocols after transmission of a (BSSMAP) Handover Command or RANAP-Relocation Command message and until receipt of a Handover Complete, Relocation Complete, Handover Failure or Relocation Cancel message.

In the uplink, the UE is responsible for delivering the CS domain messages across the radio interface. Once the message has been received by part of the network, it is the network's responsibility to deliver the message to the MSC. This can result in duplicate message delivery to the CN. The RAN shall ensure that the protocol used between UE and RAN permits any duplicate messages that are delivered to the CN, to be correctly discarded by N(SD) mechanism specified in 3GPP TS 24.007 [22] for the uplink CC, MM and CISS messages.

6.12 Relations between SRNS relocation and location registration

This clause clarifies the need for separate handling of MM registration area (LA and RA) information in RRC idle mode respective in RRC connected mode. The following example illustrates relations between SRNC relocation, registration area

(LA/RA) change and LA/RA updates. As shown in the example, this is equally applicable for a combined MSC + SGSN as well as the 3G-MSC/VLR and 3G-SGSN.

NOTE 1: The example is based on the assumptions that one RNC can set up Iu connections to only one 3G_MSC/VLR (or combined MSC+SGSN) and only one 3G_SGSN (or combined MSC+ SGSN), and that the CN node is configured to only send page to the RNC(s) that is controlling cells within the relevant LA/RA.

Preconditions (see figure 6.7):

3GPP TSG-SA2 Meeting #24 *Tdoc S2-021511*
Madrid, Spain, April 22-26, 2002 **rev of S2-021332**

CR-Form-v4

CHANGE REQUEST

⌘ **23.221** **CR** **31** rev⌘ **2** ⌘ Current version: 4.1.0 ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [**NO**] Access Network [**X**] Core Network [**NO**]

Title:	⌘	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection
Source:	⌘	Vodafone Ltd.
Work item code:	⌘	TEI
Date:	⌘	26/4/02
Category:	⌘	**A/F**
Release:	⌘	REL-4

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)*
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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)

Reason for change:	⌘	The CS domain expects reliable message delivery. However this does not seem to be documented anywhere and could lead to manufacturers believing that the Cell FACH state is a suitable state in which to transfer CS domain signalling message. In addition, the requirements for handling CS domain signalling during handover do not seem to have been documented. The intention of this CR is to ensure that changes are NOT needed to the UE or to the MSC. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.
Summary of change:	⌘	The CS domain signalling requirements are added in a new section.
Consequences if not approved:	⌘	Use of the Cell FACH state could lead to high call failure rates, and, the associated behaviour for the mobile is undefined. MSC or RNC functionality that is not complaint to the behaviour described in this CR could lead to high call failure rates. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.
Clauses affected:	⌘	Section 2 and a new section, 6.11a, is added.

Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘	This is a “mirror CR” to an R’99 change to 23.121.		

1 Scope

This document covers details the architectural requirements for the GSM in Iu mode and UMTS systems. In particular it details the high level requirements for the Circuit Switched (CS) Domain and the stage 2 procedures that span more than one domain/subsystem within UMTS and GSM. The reference model to which these procedures apply can be found within 3G TS 23.002 [1]. In addition, A mode to Iu mode handover for CS services is addressed. Detailed architectural requirements within the subsystems are contained within the remainder of the 23 series of specifications e.g. the requirements for the Packet Switched (PS) domain are contained within 3G TS 23.060 [2] and the requirements for the Bearer Independent CS Core Network are contained in 3G TS 23.205[14].

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This specification may contain references to pre-Release-4 GSM specifications. These references shall be taken to refer to the **Error! Style not defined.** version where that version exists. Conversion from the pre-Release-4 number to the Release 4 (onwards) number is given in subclause 6.1 of 3GPP TR 41.001.

[1] 3GPP TS 23.002: "Network Architecture".

[2] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[3] 3GPP TS 23.012: “ Location management procedures”

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[6] 3G TS 25.301: “Radio interface protocol architecture”

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[8] 3GPP TR 21.905: "3G Vocabulary".

[9] 3GPP TS 25.413: “ UTRAN Iu interface RANAP signalling”

[10] 3GPP TS 25.410: “ UTRAN Iu Interface: General Aspects and Principles”

[11] void

[12] 3G TS 43.051 “GERAN Overall Description”

[13] 3G TS 23.153 ,"Out of Band Transcoder Control - Stage 2".

[14] 3G TS 23.205, “Bearer Independent CS Core Network – Stage 2”

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[16] RFC2766 "Network Address Translation - Protocol Translation (NAT-PT)", G. Tsirtsis, P. Srisuresh. February 2000.

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NOTE 1: The example is based on the assumptions that one RNC can set up Iu connections to only one 3G_MSC/VLR (or combined MSC+SGSN) and only one 3G_SGSN (or combined MSC+ SGSN), and that the CN node is configured to only send page to the RNC(s) that is controlling cells within the relevant LA/RA.

Preconditions (see figure 6.7):

3GPP TSG-SA2 Meeting #24
Madrid, Spain, April 22-26, 2002

Tdoc S2-021510
rev of S2-021331

CR-Form-v4

CHANGE REQUEST

⌘ **23.121** **CR** **64** rev⌘ **2** ⌘ Current version: **3.5.1** ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [**N O**] Access Network [**X**] Core Network [**N O**]

Title:	⌘	CS domain signalling requirements: MSC and RNC behaviour relating to handover and cell reselection
Source:	⌘	Vodafone Ltd.
Work item code:	⌘	TEI
Date:	⌘	26/4/02
Category:	⌘	**F**
Release:	⌘	R99

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A *(corresponds to a correction in an earlier release)*
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2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The CS domain expects reliable message delivery. However this does not seem to be documented anywhere and could lead to manufacturers believing that the Cell FACH state is a suitable state in which to transfer CS domain signalling message. In addition, the requirements for handling CS domain signalling during handover do not seem to have been documented. The intention of this CR is to ensure that changes are NOT needed to the UE or to the MSC. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.
Summary of change:	⌘	The CS domain signalling requirements are added in a new section.
Consequences if not approved:	⌘	Use of the Cell FACH state could lead to high call failure rates, and, the associated behaviour for the mobile is undefined. MSC or RNC functionality that is not complaint to the behaviour described in this CR could lead to high call failure rates. If the concept of this CR is rejected, then very substantial changes will be required to UEs and MSCs.
Clauses affected:	⌘	Section 2 and a new section, 4.3.10a, is added.

Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

1 Scope

The present document covers issues related to the evolution of the GSM platform towards UMTS with the overall goal of fulfilling the UMTS service requirements, the support of the UMTS role model, support of roaming and support of new functionality, signalling systems and interfaces.

2 References

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- 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.

[1] 3GPP TS 22.001 : « Services Principles ».

[2] 3GPP TS 23.002: "Network Architecture".

[3] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[4] ETSI TC-SMG GSM 11.14: "Specification of Subscriber Identity Module – Mobile Equipment (SIM – ME) Interface for SIM Application Toolkit".

[5] (void)

[6] 3GPP TS 23.101: "3rd Generation mobile system Release 1999 Specifications"

[7] (void)

[8] UMTSYY.01, UE-UTRAN Radio Interface Protocol Architecture – Stage 2.

[9] UMTSYY.03, Description of UE states and Procedures in Connected Mode.

[10] C. Perkins, Editor, RFC 2002, "IP Mobility Support", October 1996.

[11] B. Aboba and M. Beadles, RFC 2486, "The Network Access Identifier", January 1999.

[12] Pat R. Calhoun and Charles E. Perkins, "Mobile IP Network Address Identifier Extension", February 1999. Work in progress (http://www.ietf.org/internet-drafts/draft-ietf-mobileip-mn-nai-00.txt).

[13] http://www.ietf.org/html.charters/mobileip-charter.html

[14] 3GPP TR 21.905: "3G Vocabulary".

[15] 3GPP TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

4.3.10 Signalling connection establishment

A signalling connection between the UE and a CN node refers here to a logical connection consisting of an RRC connection between UE and UTRAN and an Iu signalling connection between UTRAN and the CN node. The signalling connection is used for transfer of higher layer (MM, CM) information between the UE and the CN node.
At a CM service request to one of the CN service domains, UE will only request establishment of a new signalling connection when no such connection exists towards the applicable CN service domain.
If no RRC connection exists, this is established in conjugation with (before) the transfer of the signalling establishment request. At the RRC connection establishment, an UE context is built up in the SRNC.
If an RRC connection is already established, the UE will send the signalling establishment request using that RRC connection.
At reception of the signalling establishment request, the SRNC will establish an Iu connection towards the CN node indicated by the CN service domain type received from UE.

4.3.10a CS Domain Signalling Requirements (in particular relating to handover)

Correct operation of the Call Control, Mobility Management and Call Independent Supplementary Service protocols requires that downlink messages from the MSC shall not be lost, duplicated or delivered in error.

The RAN and Iu/A interfaces shall provide this functionality in all cases except for when the Iu/A interface SCCP connection is being changed, eg at SRNS relocation or inter-BSC (external) handover.

When the SCCP connection is being changed, the MSC shall buffer downlink CC, MM and CISS messages. Specifically, the MSC shall buffer messages from these protocols after transmission of a (BSSMAP) Handover Command or RANAP-Relocation Command message and until receipt of a Handover Complete, Relocation Complete, Handover Failure or Relocation Cancel message.

In the uplink, the UE is responsible for delivering the CS domain messages across the radio interface. Once the message has been received by part of the network, it is the network's responsibility to deliver the message to the MSC. This can result in duplicate message delivery to the CN. The RAN shall ensure that the protocol used between UE and RAN permits any duplicate messages that are delivered to the CN, to be correctly discarded by N(SD) mechanism specified in 3GPP TS 24.007 [15] for the uplink CC, MM and CISS messages.

4.3.11 Relations between SRNS relocation and Location registration

This chapter is included in order to clarify the need for separate handling of MM registration area (LA and RA) information in RRC idle mode respective in RRC

connected mode. The following example illustrates relations between SRNC relocation, registration area (LA/RA) change and location/routing area updates. As shown in the example, this is equally applicable for a UMSC as well as the 3G-MSC/VLR and 3G-SGSN.

NOTE 1: The example is based on the assumptions that one RNC can set up Iu connections to only one 3G_MSC/VLR (or UMSC) and only one 3G_SGSN (or UMSC), and that the CN node is configured to only send page to the RNC(s) that is controlling cells within the relevant LA/RA.

Preconditions:

- LA1 (Location Area 1) is handled by 3G_MSC/VLR1 (or UMSC1) and LA2 is handled by 3G_MSC/VLR2 (or UMSC2);
- RA1 (Routing Area 1) is handled by 3G_SGSN1 (or UMSC1) and RA2 is handled by 3G_SGSN2 (or UMSC2);
- UE is registered in LA1 in 3G_MSC/VLR1 and in RA1 in 3G_SGSN1;
- the UE is in PS-CONNECTED state and a signalling connection exists between UE and 3G_SGSN1;
- the UE is in CS-IDLE state and no signalling connection exists between UE and 3G_MSC/VLR1;
- RNC1 is acting as SRNC and RNC2 is acting as DRNC;
- UE is in RRC cell connected state and with dedicated channels established to cells within both RNC1 and RNC2. UE does not listening to the PCH;
- the registration area information sent to the UE indicates LA1 and RA1.

The UE can always (at least in normal working states) identify the present available registration area (LA respective RA) associated with the respective CN service domain. The determination of the present area differs depending on the state of the UE. For UE in RRC idle mode (UE with no ongoing communication with the network) it is the cell selection mechanism in the UE that is used. For UE in RRC connected mode it is the UTRAN that determines the area (although a change can implicit be initiated by the UE).
It is the network that supplies the MM system information to the UE. For UE in RRC idle mode the MM system information is provided by the system information broadcasting function. For UE in RRC connected mode, the MM system information is supplied by the SRNC to the UE at each change of this information. This leads to that in RRC connected mode, the MM registration area (e.g. LA and RA) information sent on broadcast channel is not used.

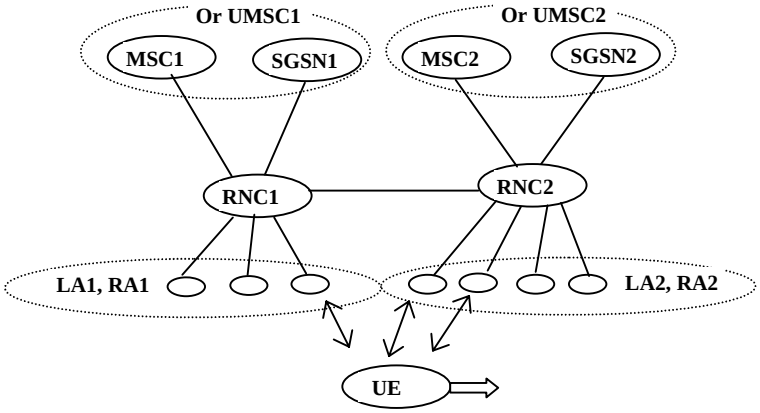

Figure 4.14: Illustration of the preconditions in the described example

In figure 4.14 MSC stands for 3G_MSC/VLR and SGSN for 3G_SGSN.
The UE moves now further towards right, leaving the coverage area of cells controlled by RNC1, and resulting in that the UE has dedicated channel(s) established to cell(s) within only RNC2. This may result in the following sequence of events:

- the SRNC (RNC1) may decide to perform an SRNC relocation resulting in that the RNC2 becomes SRNC. The change of SRNC will in this example also imply a change of SGSN (or UMSC) with an update of the UE location registration for the PS service domain;

- after this SRNC relocation or combined with this procedure, the MM registration area information sent to the UE is changed and indicates now LA2 and RA2;

NOTE 2: The MM registration area information need not be sent for every SRNS relocation, nor does it preclude MM registration area information being sent in other occasions.

- the changed MM registration area information will result in that the UE initiates a location update, which results in a registration change from LA1 in 3G_MSC/VLR1 to LA2 in 3G_MSC/VLR2.

The area information can not be changed to indicate LA2 unless SRNC relocation has been performed. This since the location update signalling will be sent from the UE, by using the established RRC connection to SRNC, and then to the 3G_MSC/VLR to which the SRNC belongs.