

Technical Specification Group Services and System Aspects **TSGS#16(02)0310**

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

Source: TSG SA WG2
Title: CRs on 23.002
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.

All CRs apply to Rel-5 (input version is 5.6.0)

S2 Tdoc #	Spec	CR #	rev	Rel	Title	cat	V in	V out	S2#24	WI
S2-021394	23.002	095	2	Rel-5	Alignment with TS23.271	F	5.6.0	5.7.0	S2#24	LCS1
S2-021454	23.002	092	2	Rel-5	General updates due to Intra Domain Connection of RAN nodes to multiple CN nodes	F	5.6.0	5.7.0	S2#24	IUFLEX
S2-021431	23.002	94	1	Rel-5	Security Gateway	F	5.6.0	5.7.0	S2#24	IMS-CCR

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3GPP TSG-SA-WG2 Meeting #24

Tdoc: S2-021394
(S2-021383, S2-021215)

Madrid, Spain, 22nd – 26th April 2002

CR-Form-v3

CHANGE REQUEST

⌘ **23.002 CR 095** ⌘ rev **2** ⌘ Current version: **5.6.0** ⌘

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:	⌘ Alignment with TS23.271		
Source:	⌘ NTT DoCoMo		
Work item code:	⌘ LCS1	Date:	⌘ 2002-APR-15
Category:	⌘ F	Release:	⌘ Rel-5
<i>Use <u>one</u> of the following categories:</i>		<i>Use <u>one</u> of the following releases:</i>	
F (essential correction)		2 (GSM Phase 2)	
A (corresponds to a correction in an earlier release)		R96 (Release 1996)	
B (Addition of feature),		R97 (Release 1997)	
C (Functional modification of feature)		R98 (Release 1998)	
D (Editorial modification)		R99 (Release 1999)	
Detailed explanations of the above categories can be found in 3GPP TR 21.900.		REL-4 (Release 4)	
		REL-5 (Release 5)	

Reason for change:	⌘ In the TS23.271v5.2.0, signalling on Le interface is defined. However, the current TS23.002 does not include the definition of signalling on Le interface.
Summary of change:	⌘ Definition of signalling on Le interface and reference for Le interface are added.
Consequences if not approved:	⌘ Sufficient information on LCS is not included in TS23.002

Clauses affected:	⌘ 2, 4a.3, 6a.3
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/>
	<input type="checkbox"/> Test specifications
	<input type="checkbox"/> 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/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://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

<< First Modification Section >>

2 References

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

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

- [1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [1a] 3GPP TR 21.905: "3G Vocabulary".
- [2] 3GPP TS 22.016: "Digital cellular telecommunications system (Phase 2+); International Mobile station Equipment Identities (IMEI)".
- [2a] 3GPP TS 22.060: "Digital cellular telecommunications system (Phase 2+); General Packet radio Service (GPRS); Service Description; Stage 1".
- [2b] 3GPP TS 22.071: "Digital cellular telecommunications system (Phase 2+); Location Services (LCS); Service Description; Stage 1".
- [2c] 3GPP TS 22.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); Service description, Stage 1".
- [3] 3GPP TS 23.003: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".
- [4] [void]
- [5] 3GPP TS 23.008: "Digital cellular telecommunications system (Phase 2+); Organisation of subscriber data".
- [6] 3GPP TS 23.009: "Digital cellular telecommunications system (Phase 2+); Handover procedures".
- [7] 3GPP TS 23.012: "Digital cellular telecommunications system (Phase 2+); Location registration procedures".
- [8] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
- [9] [void]
- [9a] 3GPP TS 23.060: "Digital cellular telecommunication system (Phase 2+); General Packet Radio Service (GPRS); Service Description; Stage 2".
- [10] 3GPP TS 23.068: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS) stage 2".
- [10a] GSM 03.64: "Digital cellular telecommunication system (Phase 2+); Overall Description of the General Packet Radio Service (GPRS) Radio Interface; Stage 2".
- [10b] 3GPP TS 23.071: "Digital cellular telecommunications system (Phase 2+); Location Services (LCS); Functional Description; Stage 2".

- [10c] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2".
- [11] ITU-T Recommendation Q.1214 (05/1995): "Distributed Functional Plane for Intelligent Network CS-1"
- [11a] 3GPP TS 23.101: "General UMTS Architecture".
- [11b] 3GPP TS 23.110: "Access Stratum (AS): Services and Functions".
- [12] GSM 04.02 R98: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [13] GSM 08.01: "Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface General aspects".
- [14] GSM 08.02: "Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Interface principles".
- [14a] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [14b] 3GPP TS 25.41x-series on definition of the Iu interface.
- [15] GSM 08.04: "Digital cellular telecommunications system (Phase 1); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".
- [16] GSM 08.06: "Digital cellular telecommunications system (Phase 2+); Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [17] GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface - Layer 3 specification".
- [18] 3GPP TS 28.020: "Digital cellular telecommunications system (Phase 2+); Rate adaption on the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [19] GSM 08.51: "Digital cellular telecommunications system (Phase 2+); Base Station Controller - Base Transceiver Station (BSC - BTS) interface - General aspects".
- [20] GSM 08.52: "Digital cellular telecommunications system (Phase 2+); Base Station Controller - Base Transceiver Station (BSC - BTS) interface - Interface principles".
- [21] GSM 08.54: "Digital cellular telecommunications system (Phase 2+); Base Station Controller (BSC) to Base Transceiver Station (BTS) interface - Layer 1 structure of physical circuits".
- [22] GSM 08.56: "Digital cellular telecommunications system (Phase 2+); Base Station Controller (BSC) to Base Transceiver Station (BTS) - Layer 2 specification".
- [23] GSM 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controller (BSC) to Base Transceiver Station (BTS) interface - Layer 3 specification".
- [24] GSM 08.60: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors".
- [25] GSM 08.61: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors (half rate)".
- [26] 3GPP TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".
- [27] GSM 09.03 R98: "Digital cellular telecommunications system (Phase 2+); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".

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- [28] 3GPP TS 29.004: "Digital cellular telecommunications system (Phase 2+); Interworking between the Public Land Mobile Network (PLMN) and the Circuit Switched Public Data Network (CSPDN)".
- [29] 3GPP TS 29.005: "Digital cellular telecommunications system (Phase 2+); Interworking between the Public Land Mobile Network (PLMN) and the Packet Switched Public Data Network (PSPDN) for Packet Assembly/Disassembly facility (PAD) access".
- [30] 3GPP TS 29.006: "Digital cellular telecommunications system (Phase 2+); Interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services".
- [31] 3GPP TS 29.007: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
- [32] 3GPP TS 29.010: "Digital cellular telecommunications system (Phase 2+); Information element mapping between Mobile Station - Base Station System and BSS - Mobile-services Switching Centre (MS - BSS - MSC) - Signalling procedures and the Mobile Application Part (MAP)".
- [33] 3GPP TS 29.011: "Digital cellular telecommunications system (Phase 2+); Signalling interworking for supplementary services".
- [34] 3GPP TS 23.228: "IP Multimedia (IM) Subsystem - Stage 2".
- [35] 3GPP TR 41.001: "GSM Release specifications".
- [36] 3GPP TR 43.051: "GERAN Overall Description, Stage 2".
- [37] 3GPP TS 23.226: "Global Text Telephony Stage 2."
- [38] 3GPP TS 26.226: "Cellular Text Telephone Modem, general description."
- [xx] LIF TS 101 "Mobile Location Protocol Specification"(Location Interoperability Forum 2001)
[Available at http://www.locationforum.org/public_document_area.htm]
- [xy] 3GPP TS29.198: "Open Service Access (OSA) Application Programming Interface (API)"

<<Next Modified Section>>

4a.3 The Location Services (LCS) entities

For further details on LCS in GSM, see GSM 03.71.

For further details on LCS in UMTS and GSM from system and core network point view, see TS 23.2471.

For further details on LCS in GERAN, see TS 43.059

For further details on LCS in UTRAN, see TS 25.305.

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<<Next Modified Section>>

6a.3 LCS-specific interfaces

6a.3.1 Interface between MSC and GMLC (Lg-interface)

The MSC -GMLC interface is used to exchange data needed by the MSC to perform subscriber authorization and allocate network resources. The GMLC provides the IMSI and requested Quality of Service information.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP). See TS 29.002.

6a.3.2 Interface between MSC and SMLC (Ls-interface)

The MSC -SMLC interface is used to exchange data needed by the SMLC to select a positioning method and compute a location estimate. The MSC provides the MS's location capabilities and requested Quality of Service information.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP). See TS 29.002.

6a.3.3 Interface between SMLC and MSC/VLR (Ls-interface)

In GSM, an NSS based SMLC supports positioning of a target MS via signaling on the Ls interface to the visited MSC.

Signalling on this interface uses BSSAP-LE, which is specified in GSM 09.31.

In UMTS, the Ls interface is not standardized, because the SMLC functionality is included in SRNC.

6a.3.4 Interface between GMLC and HLR (Lh-interface)

This interface is used by the GMLC to retrieve the VMSC location and IMSI for a particular mobile.

Signalling on this interface uses the Mobile Application Part (MAP), which in turn uses the services of Transaction Capabilities (TCAP). See TS 29.002.

6a.3.5 Interface between BSC and SMLC (Lb-interface)

In GSM, a BSS based SMLC supports positioning via signaling on the Lb interface to the BSC serving the target MS.

Signalling on this interface uses BSSAP-LE, which is specified in GSM 09.31.

In UMTS, the Lb interface is not standardized, because the SMLC functionality is included in SRNC.

6a.3.6 Interface between Peer SMLCs (Lp-interface)

In GSM, both NSS and BSS-based SMLCs may support the Lp interface to enable access to information and resources owned by another SMLC.

Signalling on this interface uses BSSAPP-LE, which is defined in GSM 09.31, and SMLCPP, which is specified in GSM 08.31.

In UMTS, the SMLC functionality is included in SRNC and the Iur interface shall include the Lp interface type of functionality.

6a.3.7 Interface between BTS and LMU (Um-interface)

The Um/Uu interface specific to LCS is defined in 24.071.

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6a.3.8 Interface between GMLC and External LCS Client (Le-interface)

~~Signalling on this interface may use Mobile Location Protocol (MLP) [xx] and Open Service Access Application Programming Interface (OSA-API) [xy], which is defined in TS29.198.~~

CHANGE REQUEST

⌘ **23.002 CR 092** ⌘ ev **2** ⌘ Current version: **5.6.0** ⌘

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:	⌘ General updates due to Intra Domain Connection of RAN nodes to multiple CN nodes		
Source:	⌘ L.M. Ericsson		
Work item code:	⌘ IUFLEX	Date:	⌘ 25 th April 2002
Category:	⌘ F	Release:	⌘ REL-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ 3GPP SA#13 approved 3GPP TS 23.236 v.5.0.0 for "Intra Domain Connection of RAN nodes to multiple CN nodes". The impacts from this TS must be incorporated into 3GPP TS 23.002.
Summary of change:	⌘ General updates due to Intra Domain Connection of RAN nodes to multiple CN nodes.
Consequences if not approved:	⌘ Incomplete description of the network architecture in 3GPP TS 23.002.

Clauses affected:	⌘ 2, 3.16, 4.1.1.2, 4.1.2.1, 4.2.1, 4.2.2		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

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

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

2 References

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- 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] [void]
- [1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.016: " International Mobile station Equipment Identities (IMEI)".
- [2a] 3GPP TS 22.060: " General Packet radio Service (GPRS); Service description; Stage 1".
- [2b] 3GPP TS 22.071: " Location Services (LCS); Service description; Stage 1".
- [2c] 3GPP TS 22.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); Service description, Stage 1".
- [3] 3GPP TS 23.003: " Numbering, addressing and identification".
- [4] [void]
- [5] 3GPP TS 23.008: " Organization of subscriber data".
- [6] 3GPP TS 23.009: " Handover procedures".
- [7] 3GPP TS 23.012: " Location Management Procedures".
- [8] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
- [9] [void]
- [9a] 3GPP TS 23.060: " General Packet Radio Service (GPRS); Service description; Stage 2".
- [10] [void]
- [10a] 3GPP TS 43.064: "Digital cellular telecommunication system (Phase 2+); General Packet Radio service (GPRS); Overall description of the GPRS radio interface; Stage 2".
- [10b] 3GPP TS 25.305: "Stage 2 Functional Specification of UE Positioning in UTRAN"
- [10c] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2".
- [11] ITU-T Recommendation Q.1214 (05/1995): "Distributed Functional Plane for Intelligent Network CS-1"
- [11a] 3GPP TS 23.101: "General UMTS Architecture".
- [11b] 3GPP TS 23.110: "UMTS Access Stratum); Services and Functions".
- [12] 3GPP TS 24.002: " GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration".

- [13] 3GPP TS 48.001: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; General aspects".
- [14] 3GPP TS 48.002: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Interface principles".
- [14a] 3GPP TS 25.410: "UTRAN Iu Interface: general aspects and principles".
- [15] 3GPP TS 48.004: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".
- [16] 3GPP TS 48.006: " Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [17] 3GPP TS 48.008: " Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".
- [18] [void]
- [19] 3GPP TS 48.051: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; General aspects".
- [20] 3GPP TS 48.052: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Interface principles".
- [21] 3GPP TS 48.054: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 1 structure of physical circuits".
- [22] 3GPP TS 48.056: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 2 specification".
- [23] 3GPP TS 48.058: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 3 specification".
- [24] 3GPP TS 48.060: " In-band control of remote transcoders and rate adaptors for full rate traffic channels".
- [25] 3GPP TS 48.061: " In-band control of remote transcoders and rate adaptors for half rate traffic channels".
- [26] 3GPP TS 29.002: " Mobile Application Part (MAP) specification".
- [27] [void]
- [28] [void]
- [29] [void]
- [30] [void]
- [31] 3GPP TS 29.007: " General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
- [32] 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)".
- [33] 3GPP TS 29.011: " Signalling interworking for supplementary services".
- [34] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [35] 3GPP TR 41.103: "GSM Release 5 specifications".
- [36] 3GPP TR 43.051: "Technical Specification Group GSM/EDGE Radio Access Network; Overall description, Stage 2".

- [37] 3GPP TS 23.226: "Global Text Telephony (GTT); Stage 2."
- [38] 3GPP TS 26.226: "Cellular Text Telephone Modem; General Description"
- [39] 3GPP TS 23.016:"Subscriber data management; Stage 2"
- [40] 3GPP TS 23.066: "Support of Mobile Number Portability (MNP); Technical realization; Stage 2"
- [41] 3GPP TS 43.068: "Voice Group Call Service (VGCS); Stage 2"
- [42] 3GPP TS 43.069: "Voice Broadcast Service (VBS); Stage 2"
- [43] 3GPP TS 23.205: "Bearer independent circuit switched core network; Stage 2"
- [44] 3GPP TS 48.014: "Base Station System (BSS) – Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1"
- [45] 3GPP TS 48.016: "Base Station System (BSS) – Serving GPRS Support Node (SGSN) interface; Network service"
- [46] 3GPP TS 48.018: "Base Station System (BSS) – Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)"
- [47] 3GPP TS 48.031: "Serving Mobile Location Centre – Serving Mobile Location Centre (SMLC – SMLC); SMLCPP specification"
- [48] 3GPP TS 29.016: "Serving GPRS Support Node (SGSN) – Visitor Location Register (VLR); Gs interface network service specification"
- [49] 3GPP TS 29.018: "Serving GPRS Support Node (SGSN) – Visitor Location Register (VLR); Gs interface Layer 3 specification"
- [50] 3GPP TS 49.031: "Network Location Services (LCS); Base Station System Application Part LCS extension (BSSAP-LE)"
- [51] 3GPP TS 29.060: "GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface"
- [52] ITU-T Recommendation H.248: "Gateway Control Protocol"
- [53] ITU-T Recommendation E.164: "The International public telecommunication numbering plan"
- [54] ITU-T Recommendation H.323: "Packet-based multimedia communications systems "
- [55] 3GPP TS 44.071: " Mobile radio interface layer 3 Location Services (LCS) specification "
- [56] 3GPP TS 23.271: "Functional stage 2 description of LCS"
- [57] ITU-T Recommendation I.363-2 : "B-ISDN ATM Adaptation Layer (AAL) type 2 specification"
- [58] ITU-T Recommendation H.245: "Control protocol for multimedia communication"
- [59] IETF RFC768:"User Datagram Protocol"
- [60] IETF RFC1889: "RTP: A Transport Protocol for Real-Time Applications"
- [61] IETF RFC2543: "SIP: Session Initiation Protocol"
- [62] 3GPP TS 23.236: " Intra Domain Connection of RAN Nodes to Multiple CN Nodes".

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

3 Definitions and abbreviations

In addition to the abbreviations given in the remainder of this clause others are listed in TR 21.905 [1a].

The definitions of the entities of the mobile system are given in the next subclause.

...

3.16 Pool-area

A pool area is an area where Intra Domain Connection of RAN Nodes to Multiple CN Nodes is applied. Within a pool-area an MS may roam without need to change the serving Core Network (CN) node. A pool-area is served by one or more CN nodes in parallel.

...

**** NEXT MODIFICATION ****

4.1.1.2 The Visitor Location Register (VLR)

A mobile station roaming in an MSC area or within a pool-area is controlled by the a Visitor Location Register in charge of this area. When a Mobile Station (MS) enters a new location area it starts a registration procedure. The An MSC in charge of that area notices this registration and transfers to the a Visitor Location Register the identity of the location area where the MS is situated. If this MS is not yet registered in the VLR, the VLR and the HLR exchange information to allow the proper handling of calls involving the MS.

A VLR may be in charge of one or several MSC areas.

The VLR contains also the information needed to handle the calls set-up or received by the MSs registered in its data base (for some supplementary services the VLR may have to obtain additional information from the HLR). The following elements are included:

- the International Mobile Subscriber Identity (IMSI);
- the Mobile Station International ISDN number (MSISDN);
- the Mobile Station Roaming Number (MSRN), see TS 23.003 [3] for allocation principles;
- the Temporary Mobile Station Identity (TMSI), if applicable;
- the Local Mobile Station Identity (LMSI), if used;
- the location area where the mobile station has been registered;
- the identity of the SGSN where the MS has been registered. Only applicable to PLMNs supporting GPRS and which have a Gs interface between MSC/VLR and SGSN;
- the last known location and the initial location of the MS.

The VLR also contains supplementary service parameters attached to the mobile subscriber and received from the HLR. The organisation of the subscriber data is outlined in TS 23.008 [5].

**** NEXT MODIFICATION ****

4.1.2.1 The Mobile-services Switching Centre (MSC)

The Mobile-services Switching Centre (MSC) constitutes the interface between the radio system and the fixed networks. The MSC performs all necessary functions in order to handle the circuit switched services to and from the mobile stations.

In order to obtain radio coverage of a given geographical area, a number of BSS and/or RNS ~~base-stations~~ are normally required; i.e. each MSC would thus have to interface to one or more BSS(s) and/or RNS(s) ~~several base-stations~~. In addition several MSCs may be required to cover a country.

When Intra Domain Connection of RAN Nodes to Multiple CN Nodes is applied, all the MSCs serving a pool-area share the responsibility to serve the MSs located in the pool-area. All these MSCs interface to all the BSS(s) and/or RNS(s) forming the pool-area.

The Mobile-services Switching Centre is an exchange, which performs all the switching and signalling functions for mobile stations located in a geographical area designated as the MSC area. When Intra Domain Connection of RAN Nodes to Multiple CN Nodes is applied, one or more MSCs serve a pool-area, but each individual MS is served by only one out of these MSCs, as described in TS 23.236 [62]. The main difference between a MSC and an exchange in a fixed network is that the MSC has to take into account the impact of the allocation of radio resources and the mobile nature of the subscribers and has to perform in addition, at least the following procedures:

- procedures required for the location registration (see TS 23.012 [7]);
- procedures required for handover (see TS 23.009 [6]).

NOTE: When this improves the readability (e.g. when dealing with inter-releases handover), the term 2G-MSC can be used to refer to an MSC Release 98 or prior, and the term 3G-MSC can be used to refer to an MSC Release 99 or later.

When needed, the MSC can be implemented in two different entities: the MSC Server, handling only signalling, and the CS-MGW, handling user's data. A MSC Server and a CS-MGW make up the full functionality of a MSC.

**** NEXT MODIFICATION ****

4.2.1 The Base Station System (BSS)

The Base Station System (BSS) is the system of base station equipments (transceivers, controllers, etc...) which is viewed by the MSC through a single A and/or Iu-CS interface as being the entity responsible for communicating with Mobile Stations in a certain area. Similarly, in PLMNs supporting GPRS, the BSS is viewed by the SGSN through a single Gb or Iu-PS interface. When Intra Domain Connection of RAN Nodes to Multiple CN Nodes is applied, a BSS may connect to several MSCs by several A and/or Iu-CS interfaces, and a BSS may connect to several SGSNs by several Gb and/or Iu-PS interfaces. The functionality for the A interface is described in TS 48.002 [14] and for the Gb interface in TS 23.060 [9a]. The functionality for the Iu-CS interface is described in TS 25.410 [14a] and for the Iu-PS interface in TS 23.060 [9a].

The radio equipment of a BSS may support one or more cells. A BSS may consist of one or more base stations. Where an Abis-interface is implemented, the BSS consists of one Base Station Controller (BSC) and one or more Base Transceiver Station (BTS). The split of functions between BSS and CN for a Iu interface is described in the 25-series of UMTS Technical Specifications.

The split of functions between BSS and CN for a A/Gb interface is described in the 48-series of GSM Technical Specifications. The split of functions between BSS and CN for a Iu interface is described in the 25-series of UMTS Technical Specifications.

NOTE: The mobile station shall operate using **only the following modes**:

- a. **A / G_b mode**, e.g. for pre-Release 4 terminals, or for Release 4 terminals when connected to a BSS with no Iu interface towards the Core Network.
- b. **Iu mode** (i.e. Iu-CS and Iu-PS), e.g. for Release 4 terminals when connected to a BSS with Iu interfaces towards the Core Network

No other modes (e.g. A/Iu-PS or Iu-CS/Gb) shall be allowed.

See also TS 43.051 [36].

**** NEXT MODIFICATION ****

4.2.2 The Radio Network System (RNS)

The Radio Network System (RNS) is the system of base station equipments (transceivers, controllers, etc...) which is viewed by the MSC through a single Iu-interface as being the entity responsible for communicating with Mobile Stations in a certain area. Similarly, in PLMNs supporting GPRS, the RNS is viewed by the SGSN through a single Iu-

PS interface. When Intra Domain Connection of RAN Nodes to Multiple CN Nodes is applied, an RNS may connect to several MSCs by several Iu-CS interfaces, and an RNS may connect to several SGSNs by several Iu-PS interfaces. The functionality for the Iu-CS interface is described in TS 25.410 [14a] and for the Iu-PS interface in TS 23.060 [9a]. The radio equipment of a RNS may support one or more cells. A RNS may consist of one or more base stations. The RNS consists of one Radio Network Controller (RNC) and one or more Node B.

The split of functions between RNS and CN is described in the 25-series of UMTS Technical Specifications.

**** END OF MODIFICATIONS ****

CHANGE REQUEST

⌘ **23.002 CR 94** ⌘ rev **-1** ⌘ Current version: **5.6.0** ⌘

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:	⌘ Security Gateway		
Source:	⌘ Nokia, Sonera		
Work item code:	⌘ IMS-CCR	Date:	⌘ 1724.04.2002
Category:	⌘ B F	Release:	⌘ REL-5
	<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>

Reason for change:	⌘ Security gateway entity is described in detail in TS 33.210 but TS 23.002 does not contain any description of the entity.
Summary of change:	⌘ A definition of the security gateway is added.
Consequences if not approved:	⌘ The overall description is not consistent.

Clauses affected:	⌘ New clause is added		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘ <input type="checkbox"/>	⌘ <input type="checkbox"/>
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

How to create CRs using this form:

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

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

2 References

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

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

- [1] [void]
- [1a] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.016: " International Mobile station Equipment Identities (IMEI)".
- [2a] 3GPP TS 22.060: " General Packet radio Service (GPRS); Service description; Stage 1".
- [2b] 3GPP TS 22.071: " Location Services (LCS); Service description; Stage 1".
- [2c] 3GPP TS 22.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL); Service description, Stage 1".
- [3] 3GPP TS 23.003: " Numbering, addressing and identification".
- [4] [void]
- [5] 3GPP TS 23.008: " Organization of subscriber data".
- [6] 3GPP TS 23.009: " Handover procedures".
- [7] 3GPP TS 23.012: " Location Management Procedures".
- [8] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
- [9] [void]
- [9a] 3GPP TS 23.060: " General Packet Radio Service (GPRS); Service description; Stage 2".
- [10] [void]
- [10a] 3GPP TS 43.064: "Digital cellular telecommunication system (Phase 2+); General Packet Radio service (GPRS); Overall description of the GPRS radio interface; Stage 2".
- [10b] 3GPP TS 25.305: "Stage 2 Functional Specification of UE Positioning in UTRAN"
- [10c] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2".
- [11] ITU-T Recommendation Q.1214 (05/1995): "Distributed Functional Plane for Intelligent Network CS-1"
- [11a] 3GPP TS 23.101: "General UMTS Architecture".
- [11b] 3GPP TS 23.110: "UMTS Access Stratum); Services and Functions".
- [12] 3GPP TS 24.002: " GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration".
- [13] 3GPP TS 48.001: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; General aspects".

- [14] 3GPP TS 48.002: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Interface principles".
- [14a] 3GPP TS 25.410: "UTRAN Iu Interface: general aspects and principles".
- [15] 3GPP TS 48.004: " Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Layer 1 specification".
- [16] 3GPP TS 48.006: " Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS - MSC) interface".
- [17] 3GPP TS 48.008: " Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".
- [18] [void]
- [19] 3GPP TS 48.051: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; General aspects".
- [20] 3GPP TS 48.052: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Interface principles".
- [21] 3GPP TS 48.054: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 1 structure of physical circuits".
- [22] 3GPP TS 48.056: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 2 specification".
- [23] 3GPP TS 48.058: " Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 3 specification".
- [24] 3GPP TS 48.060: " In-band control of remote transcoders and rate adaptors for full rate traffic channels".
- [25] 3GPP TS 48.061: " In-band control of remote transcoders and rate adaptors for half rate traffic channels".
- [26] 3GPP TS 29.002: " Mobile Application Part (MAP) specification".
- [27] [void]
- [28] [void]
- [29] [void]
- [30] [void]
- [31] 3GPP TS 29.007: " General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".
- [32] 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)".
- [33] 3GPP TS 29.011: " Signalling interworking for supplementary services".
- [34] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [35] 3GPP TR 41.103: "GSM Release 5 specifications".
- [36] 3GPP TR 43.051: "Technical Specification Group GSM/EDGE Radio Access Network; Overall description, Stage 2".
- [37] 3GPP TS 23.226: "Global Text Telephony (GTT); Stage 2."
- [38] 3GPP TS 26.226: "Cellular Text Telephone Modem; General Description"

- [39] 3GPP TS 23.016: "Subscriber data management; Stage 2"
- [40] 3GPP TS 23.066: "Support of Mobile Number Portability (MNP); Technical realization; Stage 2"
- [41] 3GPP TS 43.068: "Voice Group Call Service (VGCS); Stage 2"
- [42] 3GPP TS 43.069: "Voice Broadcast Service (VBS); Stage 2"
- [43] 3GPP TS 23.205: "Bearer independent circuit switched core network; Stage 2"
- [44] 3GPP TS 48.014: "Base Station System (BSS) – Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1"
- [45] 3GPP TS 48.016: "Base Station System (BSS) – Serving GPRS Support Node (SGSN) interface; Network service"
- [46] 3GPP TS 48.018: "Base Station System (BSS) – Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)"
- [47] 3GPP TS 48.031: "Serving Mobile Location Centre – Serving Mobile Location Centre (SMLC – SMLC); SMLCPP specification"
- [48] 3GPP TS 29.016: "Serving GPRS Support Node (SGSN) – Visitor Location Register (VLR); Gs interface network service specification"
- [49] 3GPP TS 29.018: "Serving GPRS Support Node (SGSN) – Visitor Location Register (VLR); Gs interface Layer 3 specification"
- [50] 3GPP TS 49.031: "Network Location Services (LCS); Base Station System Application Part LCS extension (BSSAP-LE)"
- [51] 3GPP TS 29.060: "GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface"
- [52] ITU-T Recommendation H.248: "Gateway Control Protocol"
- [53] ITU-T Recommendation E.164: "The International public telecommunication numbering plan"
- [54] ITU-T Recommendation H.323: "Packet-based multimedia communications systems "
- [55] 3GPP TS 44.071: " Mobile radio interface layer 3 Location Services (LCS) specification "
- [56] 3GPP TS 23.271: "Functional stage 2 description of LCS"
- [57] ITU-T Recommendation I.363-2 : "B-ISDN ATM Adaptation Layer (AAL) type 2 specification"
- [58] ITU-T Recommendation H.245: "Control protocol for multimedia communication"
- [59] IETF RFC768: "User Datagram Protocol"
- [60] IETF RFC1889: "RTP: A Transport Protocol for Real-Time Applications"
- [61] IETF RFC2543: "SIP: Session Initiation Protocol"
- [62] 3GPP TS 33.210: "3G Security; Network Domain Security; IP network layer security"

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

4a.7 IP Multimedia (IM) Core Network (CN) Subsystem entities

4a.7.1 Call Session Control Function (CSCF)

The CSCF can act as Proxy CSCF (P-CSCF), Serving CSCF (S-CSCF) or Interrogating CSCF (I-CSCF). The P-CSCF is characterised by being the first contact point for the UE within the IM subsystem (IMS); the S-CSCF actually handles the session states in the network; the I-CSCF is mainly the contact point within an operator's network for all IMS connections destined to a subscriber of that network operator. Further definitions of the P-, S- and I-CSCF are provided in [34].

4a.7.2 Media Gateway Control Function (MGCF)

The MGCF:

- Controls the parts of the call state that pertain to connection control for media channels in an IM-MGW.
- Communicates with CSCF.
- Selects the CSCF depending on the routing number for incoming calls from legacy networks.
- Performs protocol conversion between ISUP and the IM subsystem call control protocols.
- Out of band information assumed to be received in MGCF and may be forwarded to CSCF/IM-MGW.

4a.7.3 IP Multimedia - Media Gateway Function (IM-MGW)

Note: In this document the term Media Gateway Function (MGW) is used when there is no need to differentiate between the CS domain entity and the IP Multimedia CN Subsystem entity. When referring specifically to the CS domain entity the term CS-MGW is used. When referring specifically to the IP Multimedia CN Subsystem entity, the term IM-MGW is used.

A IM-MGW may terminate bearer channels from a switched circuit network and media streams from a packet network (e.g., RTP streams in an IP network). The IM-MGW may support media conversion, bearer control and payload processing (e.g. codec, echo canceller, conference bridge), it:

- Interacts with the MGCF for resource control.
- Owns and handles resources such as echo cancellers etc.
- May need to have codecs.

The IM-MGW will be provisioned with the necessary resources for supporting UMTS/GSM transport media. Further tailoring (i.e packages) of the H.248 [52] may be required to support additional codecs and framing protocols, etc.

4a.7.4 Multimedia Resource Function Controller (MRFC)

The MRFC:

- Controls the media stream resources in the MRFP.
- Interprets information coming from an AS and S-CSCF (e.g session identifier) and control MRFP accordingly.
- Generates CDRs .

4a.7.4a Multimedia Resource Function Processor (MRFP)

The MRFP:

- Controls bearers on the Mb reference point.
- Provides resources to be controlled by the MRFC.
- Mixes incoming media streams (e.g. for multiple parties).
- Sources media streams (for multimedia announcements).
- Processes media streams (e.g. audio transcoding, media analysis).

4a.7.5 Subscription Locator Function (SLF)

The SLF:

- Is queried by the I-CSCF during the Registration and Session Setup to get the name of the HSS containing the required subscriber specific data. Furthermore the SLF is also queried by the S-CSCF during the Registration.
- Is accessed via the Dx interface

The SLF is not required in a single HSS environment. An example for a single HSS environment is a server farm architecture.

4a.7.6 Breakout Gateway Control Function (BGCF)

The Breakout Gateway control function (BGCF) selects the network in which PSTN breakout is to occur and - within the network where the breakout is to occur - selects the MGCF.

4a.7.7 Application Server (AS)

An Application Server (AS) i.e., SIP Application Server, OSA Application Server, or CAMEL IM-SSF, offers value added IM services and resides either in the user's home network or in a third party location. The third party could be a network or simply a stand-alone AS.

The Serving-CSCF to AS interface is used to provide services. Two cases were identified:

- Serving-CSCF to an AS in Home Network.
- Serving-CSCF to an AS in a trusted External Network (e.g., Third Party or Visited). The S-CSCF does not provide authentication and security functionality for secure direct third party access to the IM Subsystem. The OSA framework provides a standardized way for third party access to the IM Subsystem.

An Application Server may influence and impact the SIP session on behalf of the services supported by the operator's network. An AS may host and execute services.

4a.8 Signalling Gateway Function (SGW)

The SGW performs the signalling conversion (both ways) at transport level between the SS7 based transport of signaling used in pre-Rel 4 networks, and the IP based transport of signalling possibly used in post-R99 networks (i.e. between Sigtran SCTP/IP and SS7 MTP). The SGW does not interpret the application layer (e.g. MAP, CAP, BICC, ISUP) messages but may have to interpret the underlying SCCP or SCTP layer to ensure proper routing of the signaling.

4a.9 Global Text Telephony Specific entities

Interworking between cellular text modem (CTM) and text telephony standards (e.g. V.18) used in external networks can be supported by three methods:

- Routing calls through a CTM Special resource function (CTM-SRF) in the core network. The CTM-SRF is linked in to the call path via CAMEL procedures. Depending on operator configuration the CTM-SRF may also be linked in to the call path for Emergency calls.
- A CTM / Text telephone converting function included along the speech call path selected by the network after an indication from the terminal that CTM is required.
- A CTM / Text telephone converting function included in all speech call paths.

Further information of the support for text telephony is found in TS 23.226 [37].

For further details of CTM, see TS 26.226. [38]

4a.X Security Gateway (SEG)

The UMTS network domain shall be logically and physically divided into security domains in order to protect IP based control plane signalling. These security domains typically coincide with operator borders.

The interface between different security domains is protected by Security Gateways (SEGs). The SEGs are responsible for enforcing the security policy of a IP security domain towards other SEGs in the destination IP security domain. All NDS/IP traffic shall pass through a SEG before entering or leaving a security domain. The security policy between security domains is subject to interdomain agreements. This may differ from the security policy within the same security domain, which is optional to implementation and unilaterally decided by the security domain operator. For further details of SEG, see TS 33.210 [62].