Technical Specification Group Services and System Aspects **TSGS#18(02)0770**

Meeting #18, New Orleans, U.S.A., 9-12 December 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 #18.
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.

Tdoc #	Title	Spec	CR #	cat	Version in	REL	WI	S2 meeting
S2-023493	Scope of TS 23.002	23.002	111rev1	F	4.5.0	4	TEI4	S2-28
S2-023494	Scope of TS 23.002	23.002	112rev1	A	5.8.0	5	TEI5	S2-28
S2-023583	Corrections in the LCS figures	23.002	114rev1	F	4.5.0	4	LCS	S2-28
S2-023584	Corrections in the LCS figures	23.002	115rev1	F	5.8.0	5	LCS	S2-28
S2-023669	Corrections in the LCS descriptions of 23.002	23.002	107rev5	F	4.5.0	4	LCS	S2-28
S2-023670	Corrections in the LCS descriptions of 23.002	23.002	108rev4	F	5.8.0	5	LCS1	S2-28
S2-023057	Service architecture	23.002	106rev1	F	5.8.0	5	IMS-CCR	S2-27
S2-023268	PCF to PDF Changes	23.002	110	F	5.8.0	5	IMS-CCR	S2-28

CR-Form-v7

CHANGE REQUEST

| ⌘ | **23.002** CR **106** | ⌘ **rev** | **1** | ⌘ | Current version: | **5.8.0** | ⌘ |

*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: ⌘	Relocation of service architecture material from 23.228 to 23.002	
Source: ⌘	Lucent Technologies	
Work item code: ⌘	IMS-CCR	**Date:** ⌘ 14.10.2002
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)
  Rel-6   (Release 6)

Reason for change: ⌘	Some service architecture information from 23.228 belongs in 23.002.
Summary of change: ⌘	Move some text from 232.228 to 23.002
Consequences if not approved: ⌘	Developers will have difficulty finding relevant information

Clauses affected: ⌘		

	Y	N		
Other specs affected: ⌘	X		Other core specifications ⌘	TS 23.228 CR-211
			Test specifications	
			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.

5.5 Configuration of IM CN Subsystem entities

The configuration of IM CN Subsystem entities is presented in figure 6. In the figure, all the functions are considered implemented in different logical nodes. If two logical nodes are implemented in the same physical equipment, the relevant interfaces may become internal to that equipment.

Only the interfaces specifically linked to the IM subsystem are shown, i.e. all the SGSN, GGSN and HSS interfaces depicted in figure 1 are still supported by these entities even if not shown.
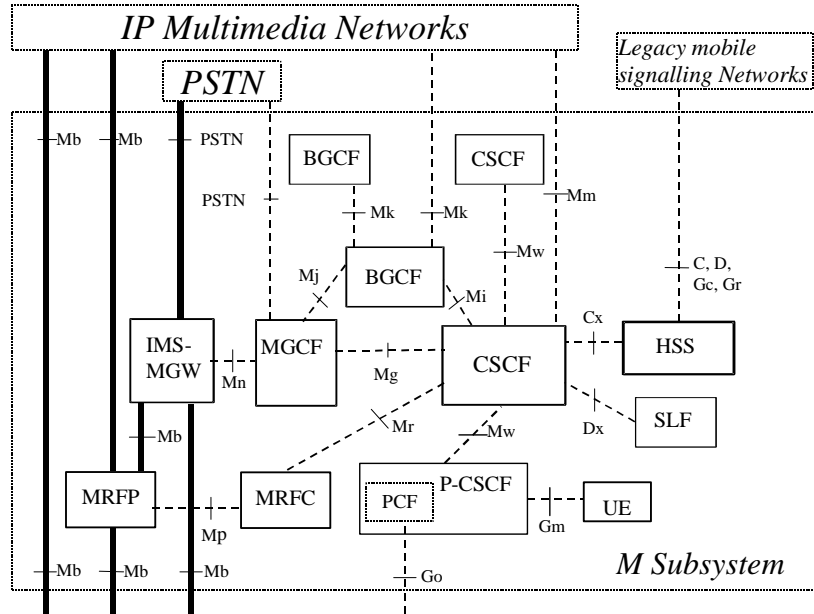
Figure 6: Configuration of IM Subsystem entities

The figure below depicts an overall view of the functional architecture for services.
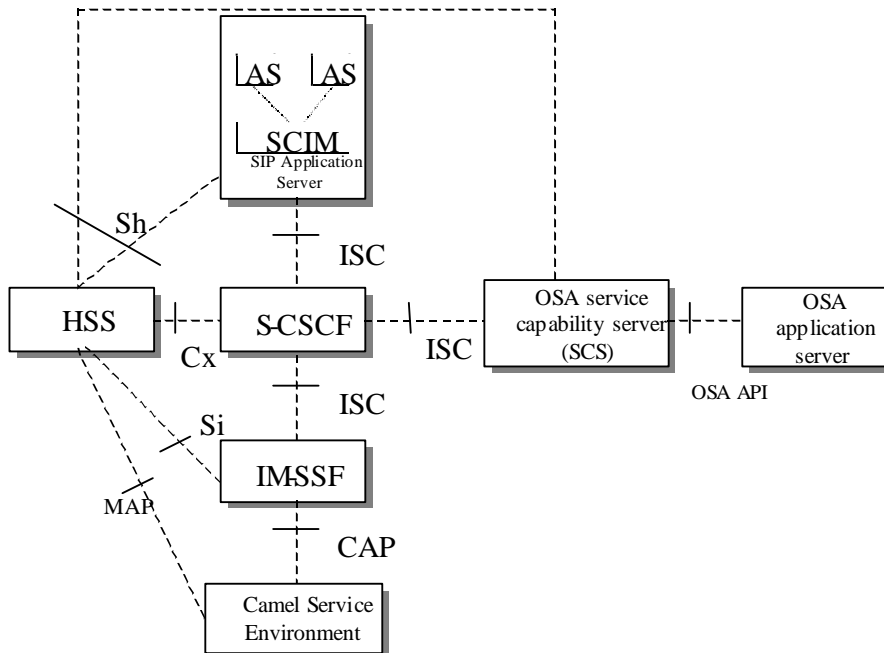
Figure 6a: Functional architecture for the provision of service in the IMS

Legend:
Bold lines: interfaces supporting user traffic;
Dashed lines: interfaces supporting only signalling.

The purpose of the IM SSF is to host the CAMEL network features (i.e. trigger detection points, CAMEL Service Switching Finite State Machine, etc) and to interwork with CAP.

The IM SSF and the CAP interface support legacy services only.

The application server may contain "service capability interaction manager" (SCIM) functionality and other application servers. The SCIM functionality is an application which performs the role of interaction management. The internal components are represented by the "dotted boxes" inside the SIP application server. The internal structure of the application server is outside the standards. The Sh interface shall have sufficient functionality to enable this scenario.

CR-Form-v7

CHANGE REQUEST

⌘   **23.002** CR **108**   ⌘ **rev** **4** ⌘   Current version: **5.8.0** ⌘

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:	⌘	Corrections in the LCS descriptions of 23.002
Source:	⌘	Nokia, Nortel Networks
Work item code: ⌘	LCS	***Date:*** ⌘ 05.12.2002

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)*
Rel-6   *(Release 6)*

Reason for change: ⌘	Architectural changes occurred from Release 99 to Release 4. Updates to 23.002 are needed to align this specification properly with current LCS specifications based on changes in the Radio Acess Networks, GERAN & RAN.
	In GERAN, an NSS-based SMLC is no longer supported from Release 4 and onwards.
	In UTRAN, in Release 4 the SMLC is integrated in the SRNC.

Summary of change: ⌘	Section 2: References updated, Added LCS stage 2 references for GERAN LCS, RAN, LCS
	Section 4a.3 LCS entities should refer to the current stage 2 specifications defined by TSG SA, TSG GERAN and TSG RAN.
	Section 4a.3.1 This section was updated according to RAN & GERAN LCS release 5 specifications and architecture. (TS 25.305 & TS43.059)
	Section 4a3.2 (GMLC) Removed 'GSM' from in front of PLMN
	Section 4a3.3 Void information about the LMU is included in section 4a.3.1
	Section 6a.3.1 Aligned all MAP LCS interfaces under one section heading as in 23.271. (Lg, Lh, and Lc (which was not included in this section))

		Section 6a.3.2 Removed – Ls interface not supported in Release 4 and onward.
		Section 6a.3.3 Removed – Ls interface not supported in Release 4 and onward.
		Section 6a.3.4 Move Lh i/f reference under section 6a.3.1
		Section 6a.3.5 Updated Lb i/f based on GERAN LCS specifications (UTRAN does not use Lb interface only integrated SMLC in Release 4)
		Section 6a.3.6 Updated based on UTRAN & GERAN LCS specifications
		Section 6a.3.7 Editorial
		Section 6a.3.9 Defined Uu interface for Stand-Alone LMU and UE, positioning entities associated with the SRNC. (LCS for over the UTRAN air interface)
		Section 6a.3.10 Defined Iu-pc interface
Consequences if not approved:	⌘	23.002 will have incorrect references and will not be aligned with current LCS architecture.

Clauses affected:	⌘	2, 4a.3, 4a.3.1, 4a.3.2, 4a3.3, 6a.3.1, 6.a3.2, 6a.3.3, 6a.3.4, 6a.3.5 6a.3.6, 6a.3.7, 6a.3.9, 6a.3.10
		Y **N**	
Other specs affected:	⌘	**X** Other core specifications ⌘ **X** Test specifications **X** O&M Specifications	
Other comments:	⌘	

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************First Modified Section ****************

2   References

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

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

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

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

[1]   [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]   3GPP TS 22.127: "Open Service Access (OSA)

[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".

[10d]   3GPP TS 43.059: "Functional Stage 2 Description of Location Services in GERAN"

[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]   3GPP TS 22.228: "Service requirements for the IP Multimedia Core Network Subsystem"

[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 RFC3261: "SIP: Session Initiation Protocol"

[62]   LIF TS 101 "Mobile Location Protocol Specification"(Location Interoperability Forum 2001) [Available at http://www.locationforum.org/public_document_area.htm]

[63]   3GPP TS29.198: "Open Service Access (OSA) Application Programming Interface (API)"

[64]   3GPP TS 33.210: "3G Security; Network Domain Security; IP network layer security"

[65] 3GPP TS 23.236: " Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[66] 3GPP TS 25.453: "UTRAN Iupc interface PCAP signalling"

*************** Next Modified Section *********************

4a.3 The Location Services (LCS) entities

This section describes the Location Services entities found in the Core Network and Radio Access Network that support positioning methods for the UE/MS.

For further details on LCS in UMTS and GSM from system and core network point view, see 3GPP TS 23.271 [56].

For further details on LCS in UTRAN, see 3GPP TS 25.305 [10b].

For further details on LCS in GERAN, see 3GPP TS 43.059 [10d].

4a.3.1 Location Services (LCS) entities in RAN

The RAN (UTRAN and GERAN) supports one or more UE/MS positioning methods to calculate the geographical position of the UE/MS and responds to the UE/MS location request received from the CN. The RAN may broadcast LCS assistance data to Ues/MSs under its coverage. In case this assistance data is ciphered, the ciphering key is provided by the CN to the UE/MS.

To support UE positioning methods, the RAN is made of several entities like:

BSC/SRNC: the BSC for GERAN and SRNC for UTRAN receive authenticated location requests from the CN:

- In UTRAN, the SRNC co-ordinates the positioning requests taking into account their priority and it selects the positioning method to fulfil the requested accuracy. It interfaces, when necessary, with the CRNC which mainly manages resources allocated to UE positioning operations and requests UE Positioning related measurements from its associated Node Bs and LMUs.

- In GERAN, the BSC passes the location request to the SMLC.

SMLC:

- The Serving Mobile Location Center (SMLC) function can be part of the RNC or be a SAS (Stand-Alone A-GPS SMLC) for UTRAN. The SMLC function can be part of the BSC or be in a separate SMLC server for GERAN.

- In UTRAN, the SMLC function provides GPS assistance data to the RNC and acts as a location calculation server if the location estimates are not to be calculated in the RNC.

- In GERAN, the SMLC function co-ordinates the positioning request, schedules resources required to perform positioning of a mobile, and calculates the final location estimate and accuracy. The SMLC may control a number of LMUs.

LMU: The Location Measurement Unit (LMU) entity makes measurements for one or more positioning methods.

Node B: Node B is a network element of UTRAN that may provide measurement results for position estimation and makes measurements of radio signals.

CBC: The Cell Broadcast Center, in GERAN, the SMLC function may interface a CBC in order to broadcast assistance data using existing cell broadcast capabilities.

For detail on Location services, entities and interfaces provided by UTRAN, see 3GPP TS 25.305 [10b].

For detail on Location services, entities and interfaces provided by GERAN, see 3GPP TS 43.059 [10d].

Serving Mobile Location Center (SMLC)

In GSM, the Serving Mobile Location Center (SMLC) node is responsible for managing the overall co-ordination and scheduling of resources required to perform positioning of a mobile, and calculating the final location estimate and accuracy. There may be more than one SMLC in a PLMN.

In UMTS, the SMLC functionality is integrated in SRNC.

In GSM, two types of SMLC are possible:

    NSS based SMLC: supports the Ls interface;

    BSS based SMLC: supports the Lb interface.

An NSS based SMLC supports positioning of a target MS via signaling on the Ls interface to the visited MSC. A BSS based SMLC supports positioning via signaling on the Lb interface to the BSC serving the target MS. Both types of SMLC may support the Lp interface to enable access to information and resources owned by another SMLC.

The SMLC/SRNC controls a number of LMUs for the purpose of obtaining radio interface measurements to locate or help locate MS subscribers in the area that it serves. The SMLC/SRNC is administered with the capabilities and types of measurement produced by each of its LMUs.

In GSM, signaling between an NSS based SMLC and LMU is transferred via the MSC serving the LMU using the Ls interface and either the Um interface for a Type A LMU or the Abis interface for a Type B LMU. Signaling between a BSS based SMLC and LMU is transferred via the BSC that serves or controls the LMU using the Lb interface and either the Um interface for a Type A LMU or the Abis interface for a Type B LMU.

In GSM, for Location Services, when a Cell Broadcast Center (CBC) is associated with a BSC, the SMLC may interface to a CBC in order to broadcast assistance data using existing cell broadcast capabilities. The SMLC shall behave as a user, Cell Broadcast Entity, to the CBC [8].

In UMTS, for Location Services the SRNC generates LCS assistance data. Broadcasting, encryption and charging of LCS assistance data in UMTS is for further study and will be specified in later releases.

4a.3.2　Gateway Mobile Location Center (GMLC)

The Gateway Mobile Location Center (GMLC) is the first node an external Location Application accesses in the GSM PLMN. The GMLC performs registration authorization and requests routing information from the HLR. There may be more than one GMLC in a PLMN.

4a.3.3　Void Location Measurement Unit (LMU)

An LMU makes radio measurements to support one or more positioning methods.

Two types of LMU are defined:

    Type A LMU: accessed over the normal GSM air interface;

    Type B LMU:accessed over the base station to controller interface (Abis in GSM and Iub in UMTS).

A type A LMU is accessed exclusively over the GSM air interface (Um interface): there is no wired connection to any other network element.

In GSM, a type A LMU has a serving BTS and BSC that provide signaling access to a controlling SMLC. With an NSS based SMLC, a type A LMU also has a serving MSC and VLR and a subscription profile in an HLR. A type A LMU always has a unique IMSI and supports all radio resource and mobility management functions of the GSM air interface that are necessary to support signaling using an SDCCH to the SMLC. A type A LMU supports those connection management functions necessary to support LCS signaling transactions with the SMLC and may support certain call control functions of to support signaling to an SMLC using a circuit switched data connection.

In UMTS, a type A LMU has signaling access to the SRNC. Type A LMU is not supported in UMTS release 1999.

In GSM, a Type B LMU is accessed over the Abis interface from a BSC. The LMU may be either a standalone network element addressed using some pseudo-cell ID or connected to or integrated in a BTS. Signaling to a Type B LMU is by means of messages routed through the controlling BSC for a BSS based SMLC or messages routed through a controlling BSC and MSC for an NSS based SMLC.

In UMTS, a Type B LMU is accessed over the Iub interface from an RNC. The LMU may be either a standalone network element addressed using some pseudo-cell ID or connected to or integrated in a Node B.

**************** Next Modified Section *********************

6a.3 LCS-specific interfaces

6a.3.1 LCS interfaces using MAP

The following interfaces are based on MAP in LCS.

- **Lh interface:** interface between GMLC and HLR. This interface is used by the GMLC to request the address of the visited MSC or SGSN for a particular target UE whose location has been requested. (see TS 29.002 [26]).

- **Lg interface:** interface between GMLC - MSC and GMLC - SGSN. This interface is used by the GMLC to convey a location request to the MSC or SGSN currently serving a particular target UE whose location was requested. The interface is used by the MSC or SGSN to return location results to the GMLC. (see TS 29.002 [26]).

- **Lc interface:** between GMLC and gsmSCF, CAMEL. This interface is used to get location information for CAMEL based services. (see TS 29.002 [26]).

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 [26]).

6a.3.2 Void 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 [26]).

6a.3.3 Void 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 Void 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 [26]).

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

In GERAN, a 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 TS 49.031[50]

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

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 TS 49.031 [50].

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 GERAN, a SMLC 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 TS 49.031[50], and SMLCPP, which is specified in TS 48.031[47].

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

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 TS 49.031 [50], and SMLCPP, which is specified in TS 48.031 [47].

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 TS 44.071 [55].

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

Signalling on this interface may use Mobile Location Protocol (MLP) [62] and Open Service Access Application Programming Interface (OSA-API) [63].

6a.3.9   Interface between RNS and Stand-Alone LMU, UE (Uu-interface)

The Uu interface is used to communicate among the UE Positioning entities associated with the SRNC, the UEs and the stand-alone LMU. The Uu interface may pass measurement requests and results to and from the UE or the stand-alone LMU. UE Positioning operations at the Uu interface are generally defined in the 24- and 25-series of 3GPP Technical Specifications.

6a.3.10   Interface between SRNC and SAS (Stand-Alone A-GPS SMLC) (Iupc-interface)

The Iupc interface defined for LCS is specified in TS 25.453 [66].

**************END of Modifications***********

CR-Form-v7

CHANGE REQUEST

⌘ **23.002** CR **107** ⌘ rev **5** ⌘ Current version: **4.5.0** ⌘

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

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

Title: ⌘	Corrections in the LCS descriptions of 23.002	
Source: ⌘	Nokia, Nortel Networks	
Work item code: ⌘	LCS	***Date:*** ⌘ 5.12.2002
Category: ⌘ **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)*
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: ⌘	Architectural changes occurred from Release 99 to Release 4. Updates to 23.002 are needed to align this specification properly with current LCS specifications based on changes in the Radio Acess Networks, GERAN & RAN. In GERAN, an NSS-based SMLC is no longer supported from Release 4 and onwards. In UTRAN, in Release 4 the SMLC is integrated in the SRNC.
Summary of change: ⌘	Section 2: References updated, Added LCS stage 2 references for GERAN LCS, RAN, LCS Section 4a.3 LCS entities should refer to the current stage 2 specifications defined by TSG SA, TSG GERAN and TSG RAN. Section 4a.3.1 This section was updated according to RAN & GERAN LCS release 4 specifications and architecture. (TS 25.305 & TS43.059) Section 4a3.2 (GMLC) Removed 'GSM' from in front of PLMN Section 4a3.3 Void information about the LMU is included in section 4a.3.1 Section 6a.3.1 Aligned all MAP LCS interfaces under one section heading as in 23.271. (Lg, Lh, and Lc (which was not included in this section)) Section 6a.3.2 Removed – Ls interface not supported in Release 4 and onward. Section 6a.3.3 Removed – Ls interface not supported in Release 4 and onward.

<table>
<tr><td></td><td></td><td colspan="2">Section 6a.3.4 Move Lh i/f reference under section 6a.3.1

Duplicate Section 6a.3.4 should be Section 6a.3.5 Updated based on GERAN LCS specifications (UTRAN does not use Lb interface only integrated SMLC in Release 4)

Section 6a.3.6 Updated based on UTRAN & GERAN LCS specifications

Section 6a.3.7 Editorial

Section 6a.3.8 Defined Uu interface for Stand-Alone LMU and UE, positioning entities associated with the SRNC. (LCS for over the UTRAN air interface)</td></tr>
<tr><td>***Consequences if not approved:***</td><td>⌘</td><td colspan="2">23.002 will have incorrect references and will not be aligned with current LCS architecture.</td></tr>
</table>

<table>
<tr><td>***Clauses affected:***</td><td>⌘</td><td colspan="4">2, 4a.3, 4a.3.1, 4a.3.2, 4a3.3, 6a.3.1, 6.a3.2, 6a.3.3, 6a.3.4, 6a.3.5 6a.3.6, 6a.3.7, 6a.3.8</td></tr>
<tr><td></td><td></td><td>Y</td><td>N</td><td></td><td></td></tr>
<tr><td rowspan="3">***Other specs affected:***</td><td rowspan="3">⌘</td><td></td><td>X</td><td>Other core specifications</td><td>⌘</td></tr>
<tr><td></td><td>X</td><td>Test specifications</td><td></td></tr>
<tr><td></td><td>X</td><td>O&M Specifications</td><td></td></tr>
<tr><td>***Other comments:***</td><td>⌘</td><td colspan="4"></td></tr>
</table>

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

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

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

***********First Modified Section ***************

2 References

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

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

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

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

[1] 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". void

[10c]   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)".

[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 TR 41.001: "GSM Release specifications".

[35]   3GPP TS 43.051: "GERAN Overall Description, Stage 2"

[36]   3GPP TS 25.305: "Functional Stage 2 Description of UE Positioning in UTRAN".

[37]   3GPP TS 43.059: "Functional Stage 2 Description of Location Services in GERAN"

[38]   3GPP TS 23.271: "Functional Stage 2 Description of Location Services"

[39]   3GPP TS 49.031 : "Location Services (LCS);Base Station System Application Part LCS Extension (BSSAP-LE) "

[40]   3GPP TS 48.031: "Location Services (LCS); Serving Mobile Location Centre - Serving Mobile Location Centre (SMLC - SMLC); SMLCPP specification"

[41]   3GPP TS 44.071 : "Location Services (LCS); Mobile radio interface layer 3 Location Services (LCS) specification"

************** Next Modified Section ********************

4a.3 The Location Services (LCS) entities

This section describes the Location Services entities found in the Core Network and Radio Access Network that support positioning methods for the UE/MS.

For further details on LCS in from a system and core network point view, see 3GPP TS 23.271[38].

For further details on LCS in UTRAN, see 3GPP TS 25.305.[36].

For further details on LCS in GERAN, see 3GPP TS 43.059 [37].

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

For further details on LCS in UMTS from system and core network point view, see TS 23.171.

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

4a.3.1 Location Services (LCS) entities in RAN

Serving Mobile Location Center (SMLC)

The RAN (UTRAN and GERAN) supports one or more UE/MS positioning methods to calculate the geographical position of the UE/MS and responds to the UE/MS location request received from the CN. The RAN may broadcast LCS assistance data to UEs/MSs under its coverage. In case this assistance data is ciphered, the ciphering key is provided by the CN to the UE/MS.

To support UE positioning methods, the RAN is made of several entities like:

BSC/SRNC: the BSC for GERAN and SRNC for UTRAN receive authenticated location requests from the CN:

- In UTRAN, the SRNC co-ordinates the positioning requests taking into account their priority and it selects the positioning method to fulfil the requested accuracy. It interfaces, when necessary, with the CRNC which mainly manages resources allocated to UE positioning operations and requests UE Positioning related measurements from its associated Node Bs and LMUs.

- In GERAN, the BSC passes the location request to the SMLC.

SMLC:

- The Serving Mobile Location Center (SMLC) function is part of the RNC for UTRAN. The SMLC function can be part of the BSC or be a separate SMLC server for GERAN.

- In UTRAN, the SMLC function provides GPS assistance data to the RNC and acts as a location calculation server if the location estimates are not to be calculated in the RNC.

- In GERAN, the SMLC function co-ordinates the positioning request, schedules resources required to perform positioning of a mobile, and calculates the final location estimate and accuracy. The SMLC may control a number of LMUs.

LMU: The Location Measurement Unit (LMU) entity makes measurements for one or more positioning methods.

Node B: Node B is a network element of UTRAN that may provide measurement results for position estimation and makes measurements of radio signals.

CBC: The Cell Broadcast Center, for GERAN, the SMLC function may interface a CBC in order to broadcast assistance data using existing cell broadcast capabilities.

For detail on Location services, entities and interfaces provided by UTRAN, see 3GPP TS 25.305 [36].

For detail on Location services, entities and interfaces provided by GERAN, see 3GPP TS 43.059 [37].

In GSM, the Serving Mobile Location Center (SMLC) node is responsible for managing the overall co-ordination and scheduling of resources required to perform positioning of a mobile, and calculating the final location estimate and accuracy. There may be more than one SMLC in a PLMN.

In UMTS, the SMLC functionality is integrated in SRNC.

In GSM, two types of SMLC are possible:

NSS based SMLC: supports the Ls interface;

BSS based SMLC: supports the Lb interface.

An NSS based SMLC supports positioning of a target MS via signaling on the Ls interface to the visited MSC. A BSS based SMLC supports positioning via signaling on the Lb interface to the BSC serving the target MS. Both types of SMLC may support the Lp interface to enable access to information and resources owned by another SMLC.

The SMLC/SRNC controls a number of LMUs for the purpose of obtaining radio interface measurements to locate or help locate MS subscribers in the area that it serves. The SMLC/SRNC is administered with the capabilities and types of measurement produced by each of its LMUs.

In GSM, signaling between an NSS based SMLC and LMU is transferred via the MSC serving the LMU using the Ls interface and either the Um interface for a Type A LMU or the Abis interface for a Type B LMU. Signaling between a BSS based SMLC and LMU is transferred via the BSC that serves or controls the LMU using the Lb interface and either the Um interface for a Type A LMU or the Abis interface for a Type B LMU.

In GSM, for Location Services, when a Cell Broadcast Center (CBC) is associated with a BSC, the SMLC may interface to a CBC in order to broadcast assistance data using existing cell broadcast capabilities. The SMLC shall behave as a user, Cell Broadcast Entity, to the CBC [8].

In UMTS, for Location Services the SRNC generates LCS assistance data. Broadcasting, encryption and charging of LCS assistance data in UMTS is for further study and will be specified in later releases.

4a.3.2   Gateway Mobile Location Center (GMLC)

The Gateway Mobile Location Center (GMLC) is the first node an external Location Application accesses in the GSM PLMN. The GMLC performs registration authorization and requests routing information from the HLR. There may be more than one GMLC in a PLMN.

4a.3.3   Void Location Measurement Unit (LMU)

An LMU makes radio measurements to support one or more positioning methods.

Two types of LMU are defined:

Type A LMU: accessed over the normal GSM air interface;

Type B LMU:accessed over the base station to controller interface (Abis in GSM and Iub in UMTS).

A type A LMU is accessed exclusively over the GSM air interface (Um interface): there is no wired connection to any other network element.

In GSM, a type A LMU has a serving BTS and BSC that provide signaling access to a controlling SMLC. With an NSS based SMLC, a type A LMU also has a serving MSC and VLR and a subscription profile in an HLR. A type A LMU always has a unique IMSI and supports all radio resource and mobility management functions of the GSM air interface that are necessary to support signaling using an SDCCH to the SMLC. A type A LMU supports those connection management functions necessary to support LCS signaling transactions with the SMLC and may support certain call control functions of to support signaling to an SMLC using a circuit switched data connection.

In UMTS, a type A LMU has signaling access to the SRNC. Type A LMU is not supported in UMTS release 1999.

In GSM, a Type B LMU is accessed over the Abis interface from a BSC. The LMU may be either a standalone network element addressed using some pseudo-cell ID or connected to or integrated in a BTS. Signaling to a Type B LMU is by means of messages routed through the controlling BSC for a BSS based SMLC or messages routed through a controlling BSC and MSC for an NSS based SMLC.

In UMTS, a Type B LMU is accessed over the Iub interface from an RNC. The LMU may be either a standalone network element addressed using some pseudo-cell ID or connected to or integrated in a Node B.

*************** Next Modified Section *********************

6a.3 LCS-specific interfaces

6a.3.1 LCS interfaces using MAP

The following interfaces are based on MAP in LCS.

- **Lh interface:** interface between GMLC and HLR. This interface is used by the GMLC to request the address of the visited MSC or SGSN for a particular target UE whose location has been requested. (see TS 29.002 [26]).

- **Lg interface:** interface between GMLC - MSC and GMLC - SGSN. This interface is used by the GMLC to convey a location request to the MSC or SGSN currently serving a particular target UE whose location was requested. The interface is used by the MSC or SGSN to return location results to the GMLC. (see TS 29.002 [26]).

- **Lc interface:** between GMLC and gsmSCF, CAMEL. This interface is used to get location information for CAMEL based services. (see TS 29.002 [26]).

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 Void 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.3.43 Void 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.3.43 Void 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.3.45 Interface between BSC and SMLC (Lb-interface)

In GERANGSM, 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-TS 409.031-[39]

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

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

In GERANSM, both NSS and BSS-baseda 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 GSMTS 049.031[39], and SMLCPP, which is specified in TS GSM 048.031[40].

In UMTSUTRAN, 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 TS 44.071[41].

6a.3.8   Interface between RNS and Stand-Alone LMU, UE (Uu-interface)

The Uu interface is used to communicate among the UE Positioning entities associated with the SRNC, the UEs and the stand-alone LMU. The Uu interface may pass measurement requests and results to and from the UE or the stand-alone LMU. UE Positioning operations at the Uu interface are generally defined in the 24- and 25-series of 3GPP Technical Specifications.

CR-Form-v7

CHANGE REQUEST

⌘	**23.002** CR **115**	⌘**rev** **1** ⌘	Current version: **5.8.0** ⌘

*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:	⌘	Corrections in the LCS figures

Source:	⌘	SA2 LCS session

Work item code:⌘	LCS		*Date:* ⌘	14.11.2002

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)*
Rel-6 *(Release 6)*

Reason for change:	⌘	Architectural changes occurred from Release 99 to Release 4. Updates to 23.002 are needed to align the LCS figures in this specification properly with current LCS specifications based on changes in the Radio Acess Networks, GERAN & RAN.

Summary of change:⌘	Section 5.2.1 Confirguration of LCS architecture diagram updated to reflect GERAN LCS entities. Section 5.2.2 Confirguration of LCS architecture diagram updated to reflect UTRAN LCS entities.

Consequences if not approved:	⌘	The LCS figures in 23.002 would be incorrect.

Clauses affected:	⌘	5.2.1, 5.2.2

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

Other comments:	⌘	

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

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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 ****************

5.2 Configuration of LCS entities

5.2.1 Configuration of LCS entities for~~in~~ G~~ERAN~~SM

The configuration of LCS entities for ~~GSM~~ GERAN are is presented in figure 2. In the figure, all the functions are considered implemented in different logical nodes. If two logical nodes are implemented in the same physical equipment, the relevant interfaces may become internal to that equipment.
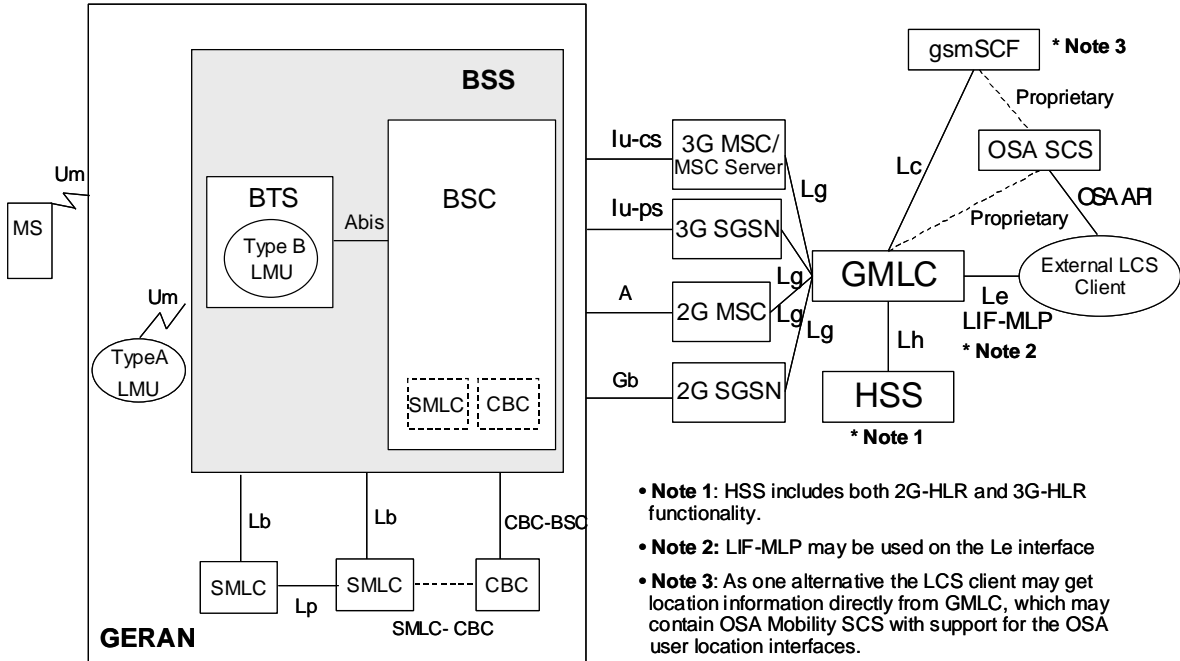

- **Note 1**: HSS includes both 2G-HLR and 3G-HLR functionality.
- **Note 2**: LIF-MLP may be used on the Le interface
- **Note 3**: As one alternative the LCS client may get location information directly from GMLC, which may contain OSA Mobility SCS with support for the OSA user location interfaces.
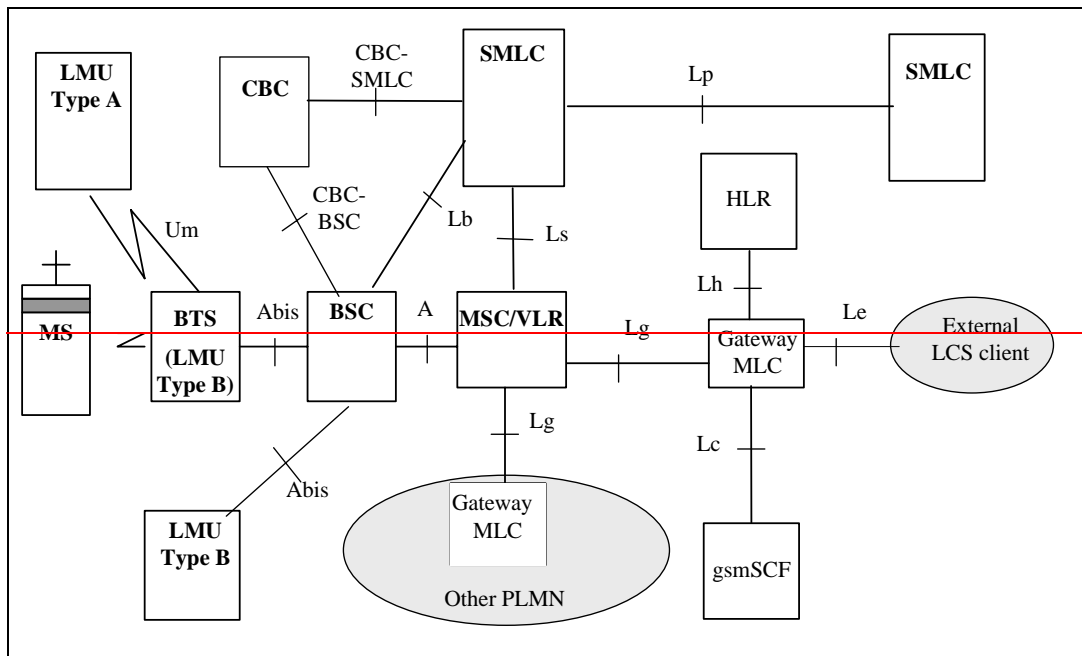
Figure 2: Configuration of LCS entities for~~in~~ a G~~ERAN~~SM PLMN

5.2.2 Configuration of LCS entities forin UTRAN

The basic configuration of UTRAN UMTS LCS is presented in figure 3. The SMLC funtionality is integrated in SRNC. There is no SMLC entity in this figure because the SMLC functionality of UTRAN is integrated in SRNC.

NOTE: The usage of CBC for LCS assistance data in UMTS is for further study. The assistance data is generated in SRNC.

- Note 1: HSS includes both 2G-HLR and 3G-HLR functionality.

- Note 2: LIF-MLP may be used on the Le interface

- Note 3: As one alternative the LCS client may get location information directly from GMLC, which may contain OSA Mobility SCS with support for the OSA user location interfaces.
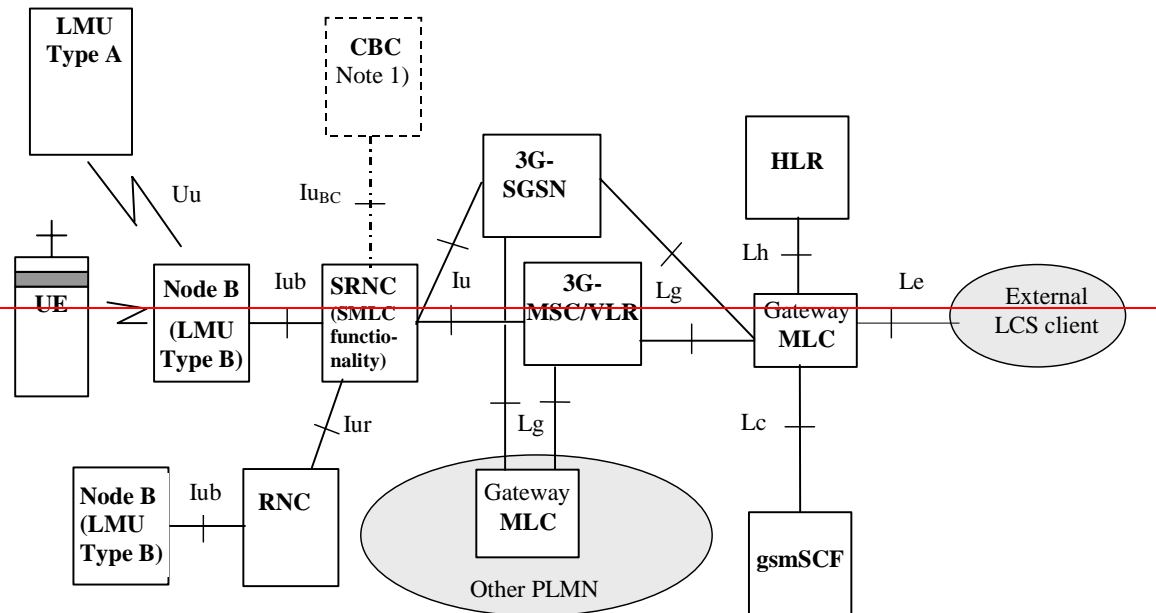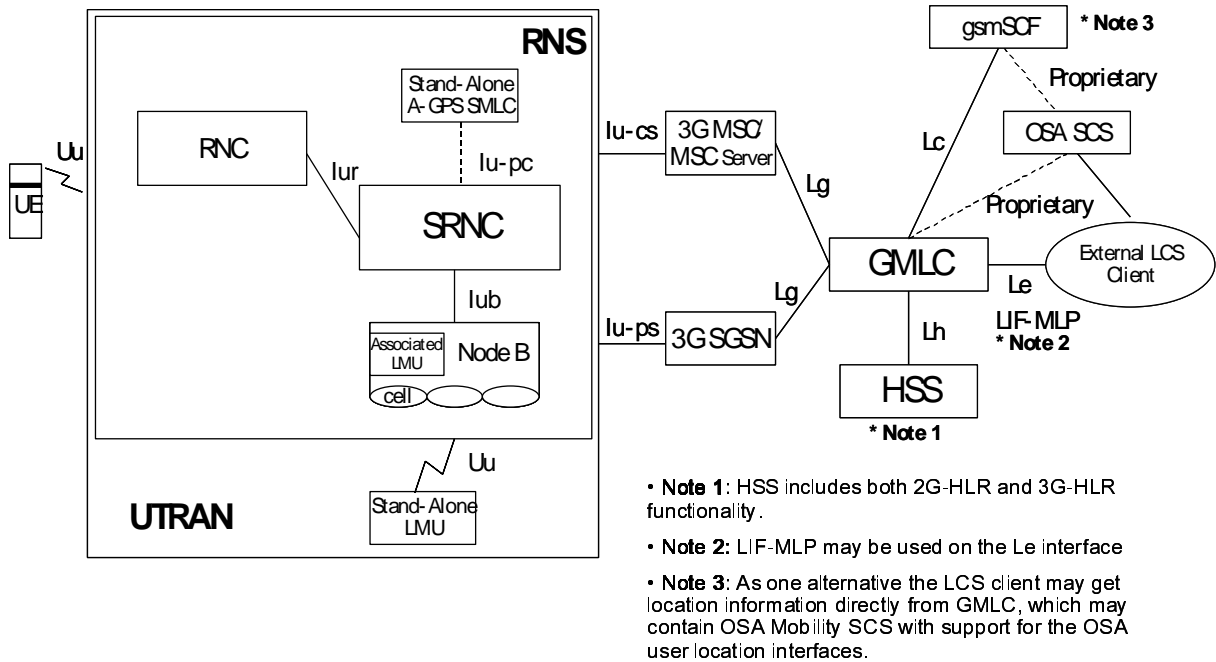
Figure 3: Configuration of a LCS entities forin a UMTS UTRAN PLMN

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CHANGE REQUEST

| ⌘ | **23.002** CR | **114** | ⌘ **rev** | **1** | ⌘ | Current version: | **4.5.0** | ⌘ |

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

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

Title:	⌘	Corrections in the LCS figures
Source:	⌘	SA2 LCS session

Work item code: ⌘	LCS		*Date:* ⌘	14.11..2002

Category:	⌘	**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)
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:	⌘	Architectural changes occurred from Release 99 to Release 4. Updates to 23.002 are needed to align the figures in this specification properly with current LCS specifications based on changes in the Radio Acess Networks, GERAN & RAN.
Summary of change:	⌘	Section 5.2.1 Confirguration of LCS architecture diagram updated to reflect GERAN LCS entities. The Le interface is not standardized in Rel-4. Section 5.2.2 Confirguration of LCS architecture diagram updated to reflect UTRAN LCS entities. The Le interface is not standardized in Rel-4.
Consequences if not approved:	⌘	The LCS figures in 23.002 would be incorrect.

Clauses affected:	⌘	5.2.1, 5.2.2

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

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:
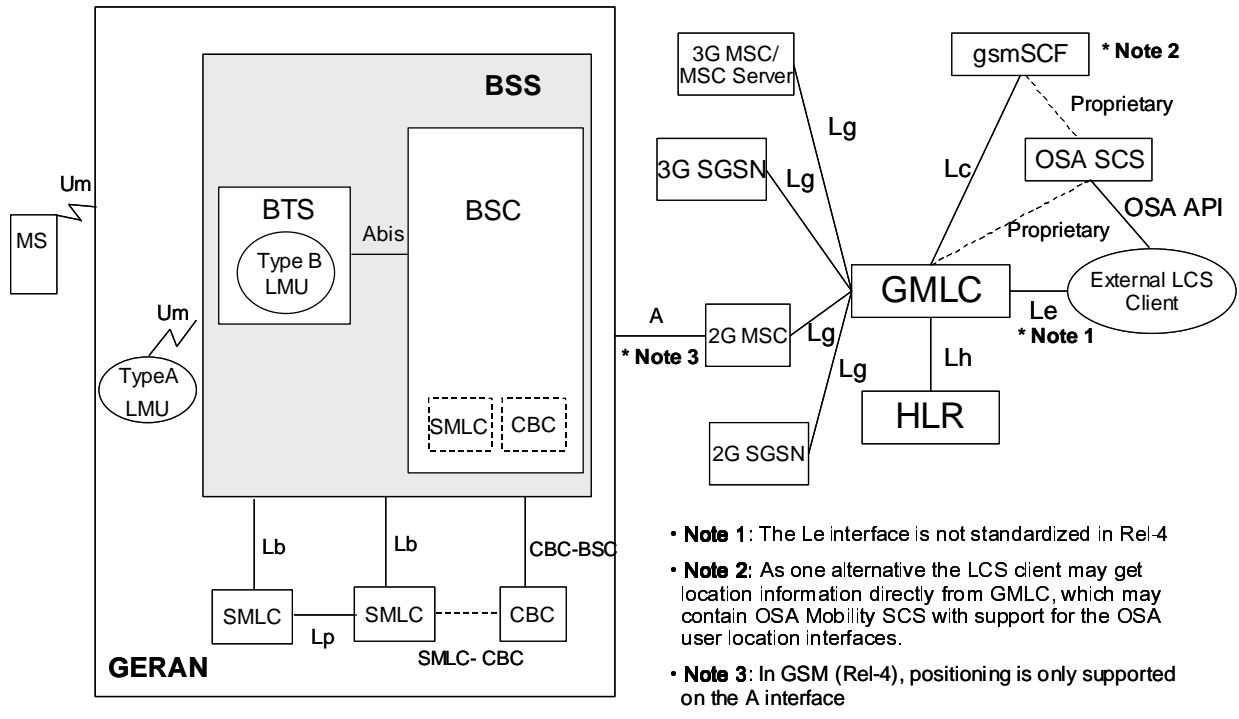
1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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

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

************First Modified Section ***************

5.2   Configuration of LCS entities

5.2.1   Configuration of LCS entities forin GERANSM

The configuration of LCS entities for GERANSM are is presented in figure 2. In the figure, all the functions are considered implemented in different logical nodes. If two logical nodes are implemented in the same physical equipment, the relevant interfaces may become internal to that equipment.
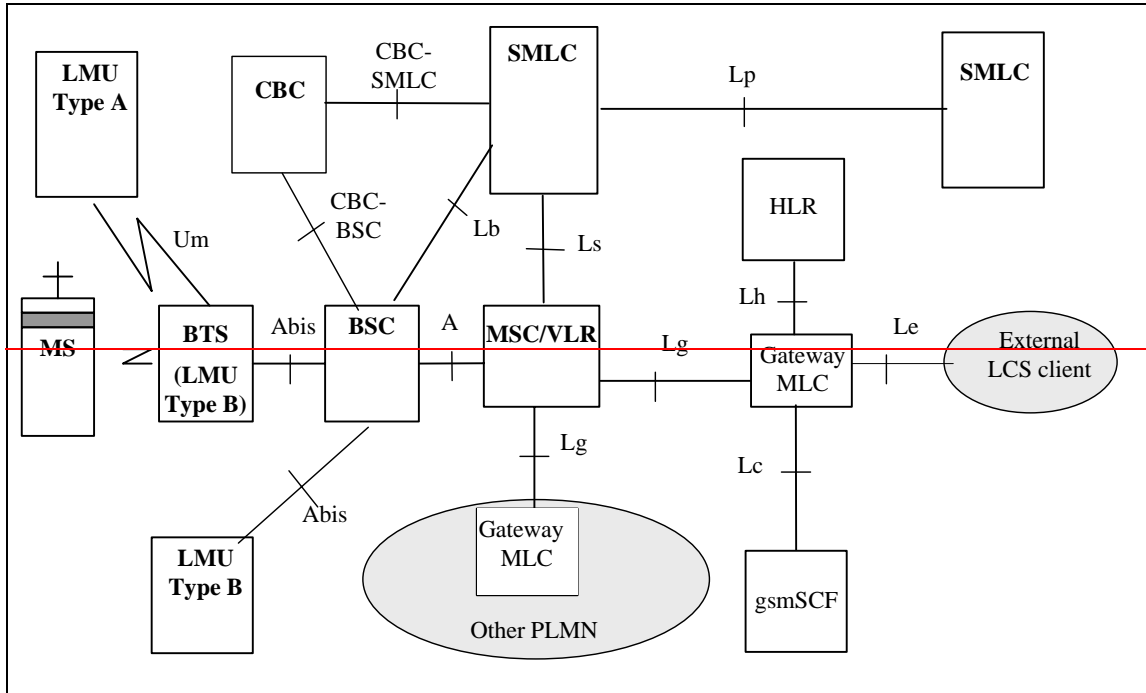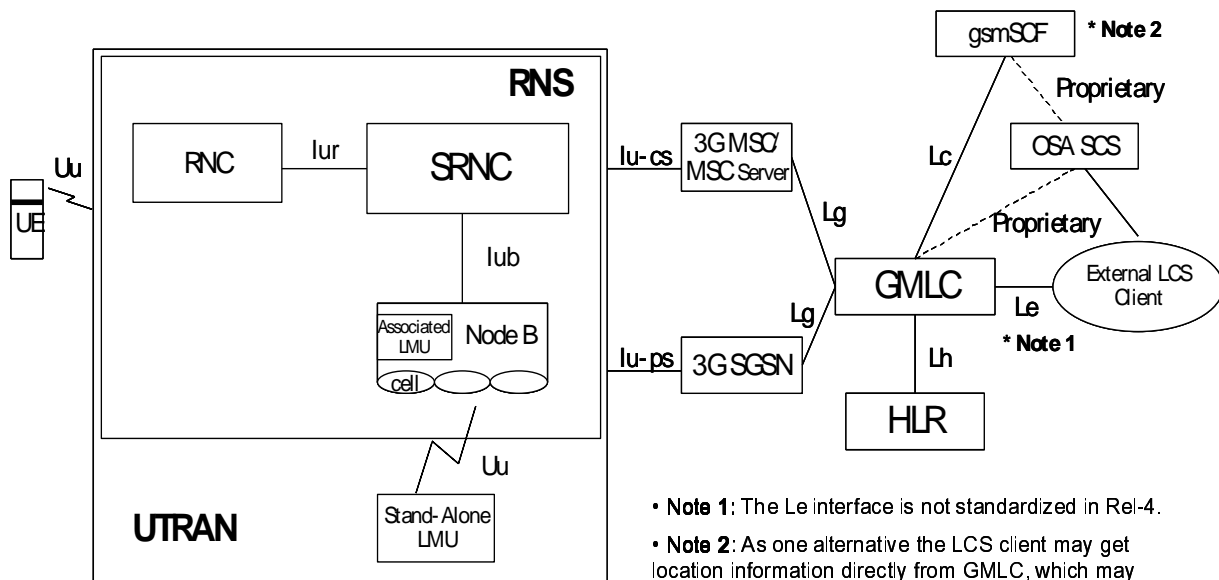

- **Note 1**: The Le interface is not standardized in Rel-4
- **Note 2**: As one alternative the LCS client may get location information directly from GMLC, which may contain OSA Mobility SCS with support for the OSA user location interfaces.
- **Note 3**: In GSM (Rel-4), positioning is only supported on the A interface

Figure 2: Configuration of LCS entities in a GERANSM PLMN

5.2.2   Configuration of LCS entities forin UTRANMTS

The basic configuration of UMTS UTRAN LCS is presented in figure 3. There is noThe- SMLC entity infunctionality this figure because the SMLC functionality of UTRAN is integrated in SRNC.

NOTE: The usage of CBC for LCS assistance data in UMTS is for further study. The assistance data is generated in SRNC.

- **Note 1**: The Le interface is not standardized in Rel-4.
- **Note 2**: As one alternative the LCS client may get location information directly from GMLC, which may contain OSA Mobility SCS with support for the OSA user location interfaces.
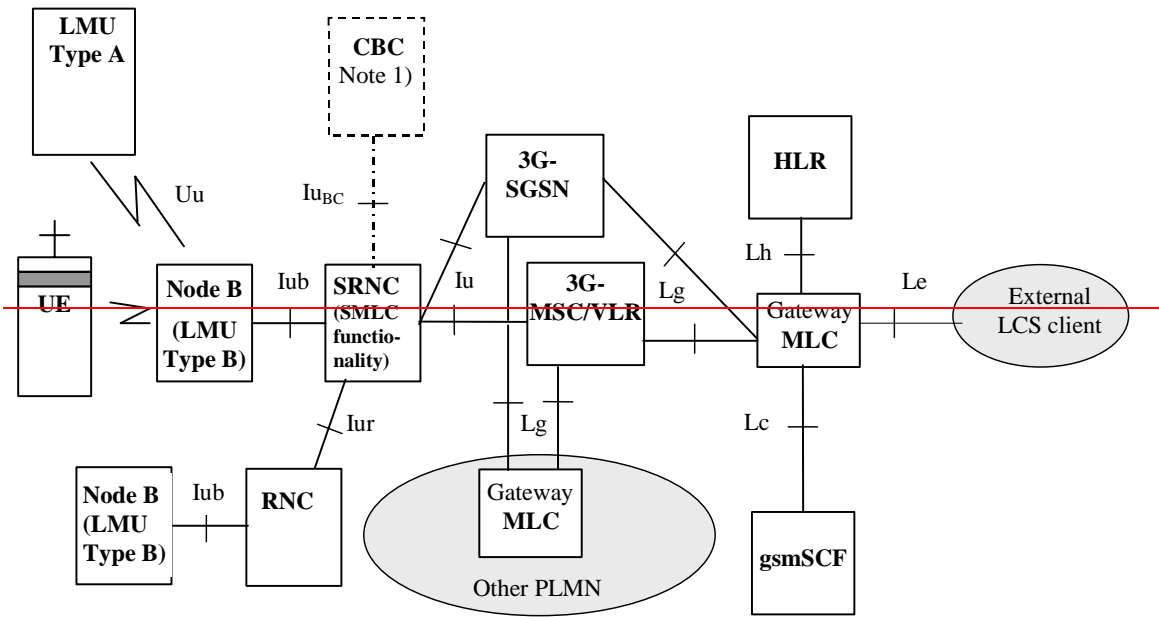
Figure 3: Configuration of a LCS entities forin a UTRANMTS PLMN

3GPP TSG-SA2 Meeting #27 *Tdoc* ⌘ *S2-023494*
Bangkok, Thailand, November 11-15, 2002

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CHANGE REQUEST

⌘ **23.002** CR **112** ⌘rev **1** ⌘ Current version: **5.8.0** ⌘

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:	⌘	Clarification of scope section in TS 23.002
Source:	⌘	Nokia
Work item code: ⌘	TEI5	*Date:* ⌘ 11.11.2002

Category: ⌘ **A**

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.

Release: ⌘ Rel-5

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:	⌘	TS 23.002 currently contains a mixture of information regarding the 3GPP system core networks and radio access networks. 23.002 belongs to SA2 and should contain an overview of all 3GPP systems including the relevant level of detail on the core network and access network aspects
Summary of change:	⌘	Changes to clarify the scope section of TS 23.002
Consequences if not approved:	⌘	The scope of TS 23.002 does not reflect the content of the specification. The uncertainty remains regarding the scope and role of TS 23.002.
Clauses affected:	⌘	Introduction, 1

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

Other comments:	⌘	This is a mirror CR of CR#111

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 and only set of changes >>

Introduction

This document presents the possible architectures of the Universal Mobile Telecommuncation System (UMTS) , covering both UTRAN and GERAN radio access techonologies.

Clause 3 of the document contains the definition of the PLMN entities.

Clause 4 of the document contains the description of the basic entities of the PLMN, and clause 4a contains the description of the specific entities of the PLMN.

Clause 5 of the document contains the configuration of the PLMN.

Clauses 6, 6a and 7 of the document contain the PLMN's basic and specific interfaces and reference points and the PLMN's interfaces towards other networks.

1 Scope

This document offers an overview of the PLMN and its architectures and configuration. The configuration and the functional entities of the PLMN and the interfaces between them are described on a general level in order to cope with possible implementations. These descriptions include interfaces between and within the core networks, the access networks, the user equipment, different service platforms, different domains and subsystems, and functional entities within domains and subsystems.

This document covers different architectural aspects with varying level of detail. In general, other specifications shall be referred to for further details; these specifications enable the reader to acquire the full understanding of a system or service feature.

Note that this document does not cover, or even list, all features of PLMNs.

3GPP TSG-SA2 Meeting #27   *Tdoc ⌘ S2-023493*
Bangkok, Thailand, November 11-15, 2002

CR-Form-v7

CHANGE REQUEST

| ⌘ | **23.002** CR **111** | ⌘**rev** | **1** | ⌘ | Current version: | **4.5.0** | ⌘ |

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

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

Title:	⌘	Clarification of scope section in TS 23.002
Source:	⌘	Nokia

Work item code:⌘	TEI4		**Date:** ⌘	11.11.2002

Category:	⌘	**F**		**Release:** ⌘	Rel-4

Use <u>one</u> 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 <u>one</u> 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:	⌘	TS 23.002 currently contains a mixture of information regarding the 3GPP system core networks and radio access networks. 23.002 belongs to SA2 and should contain an overview of all 3GPP systems including the relevant level of detail on the core network and access network aspects

Summary of change:	⌘	Changes to clarify the Scope clause Added text to the Introduction clause

Consequences if not approved:	⌘	The scope of TS 23.002 does not reflect the content of the specification. The uncertainty remains regarding the scope and role of TS 23.002.

Clauses affected:	⌘	1

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

Other comments:	⌘	Mirror CR for Rel5 is provided in CR#112

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 and only set of changes >>

Introduction

This document presents the possible architectures of the Universal Mobile Telecommuncation System (UMTS), covering both UTRAN and GERAN radio access techonologies.

Clause 3 of the document contains the definition of the PLMN entities.

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Clauses 6, 6a and 7 of the document contain the PLMN's basic and specific interfaces and reference points and the PLMN's interfaces towards other networks.

1 Scope

This document offers an overview of the PLMN and its architectures and configuration. The configuration and the functional entities of the PLMN and the interfaces between them are described on a general level in order to cope with possible implementations. These descriptions include interfaces between and within the core networks, the access networks, the user equipment, different service platforms, different domains and subsystems, and functional entities within domains and subsystems.

This document covers different architectural aspects with varying level of detail. In general, other specifications shall be referred to for further details; these specifications enable the reader to acquire the full understanding of a system or service feature.

Note that this document does not cover, or even list, all features of PLMNs.

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CHANGE REQUEST

| ⌘ | **23.002** CR **110** | ⌘rev | **-** | ⌘ | Current version: | **5.8.0** | ⌘ |

*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: ⌘	PCF to PDF Changes
Source: ⌘	Lucent Technologies
Work item code: ⌘	IMS-CCR **Date:** ⌘ 11.11.2002
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)
  Rel-6   (Release 6)

Reason for change: ⌘	It was agreed to use the Policy Decision Function teminology for compatibiltiy with other access networks.
Summary of change: ⌘	Replace the term Policy Control Function with Policy Decision Function throughout the document.
Consequences if not approved: ⌘	Confusion between the 3GPP and other architectures.

Clauses affected: ⌘	5.5 and 6a.7.9		
	Y	**N**	
Other specs ⌘	X		Other core specifications ⌘ 23.207, 23.228, 24.228, 24.229, 29.207, 29.208
affected:			Test specifications
			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.
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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

******************First Change*****************

## 5.5	Configuration of IM CN Subsystem entities

The configuration of IM CN Subsystem entities is presented in figure 6. In the figure, all the functions are considered implemented in different logical nodes. If two logical nodes are implemented in the same physical equipment, the relevant interfaces may become internal to that equipment.

Only the interfaces specifically linked to the IM subsystem are shown, i.e. all the SGSN, GGSN and HSS interfaces depicted in figure 1 are still supported by these entities even if not shown.
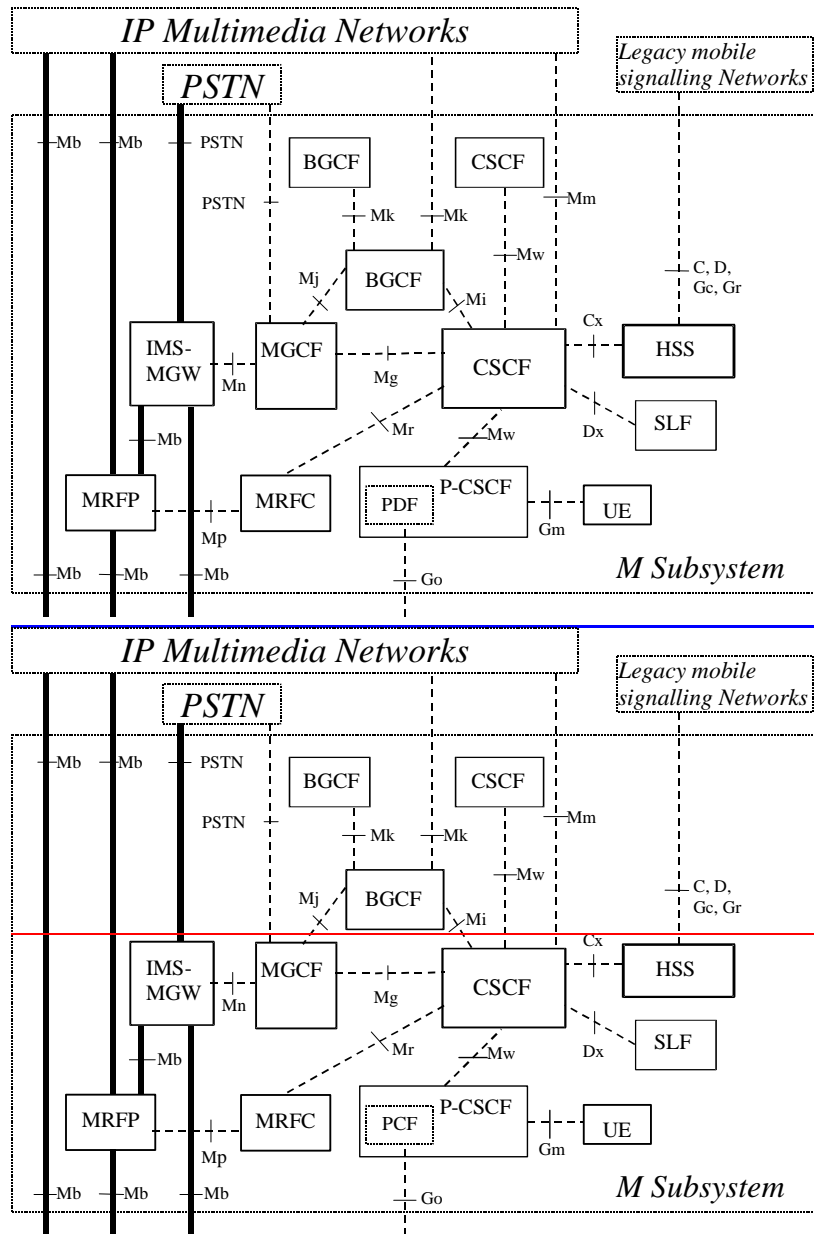
Figure 6: Configuration of IM Subsystem entities

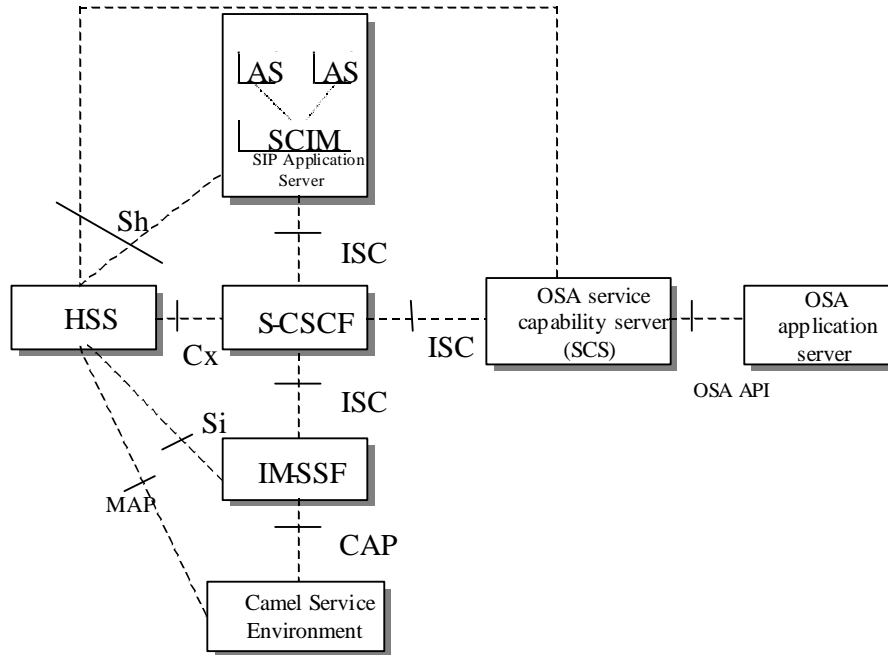The figure below depicts an overall view of the functional architecture for services.

Figure 6a: Functional architecture for the provision of service in the IMS

Legend:
Bold lines: interfaces supporting user traffic;
Dashed lines: interfaces supporting only signalling.

5.6 Configuration of Signalling Gateway Function

The Signalling gateway function is used to interconnect different signalling networks i.e. SCTP/IP based signalling networks and SS7 signalling networks. The application layer (e.g. ISUP, BICC, MAP or CAP) is not affected. The signalling gateway function may be implemented as a stand alone entity or inside another entity.
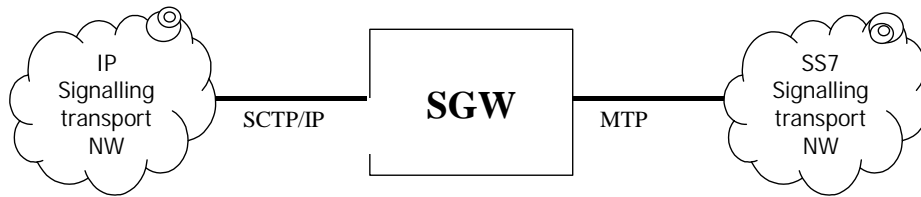
Figure 7: Configuration of a signalling gateway function

Note: SS7 application transport and SCTP/IP adaption protocols are not shown.

*****************Next Change****************

6a.7.8 [void]

6a.7.9 Reference Point GGSN – ~~PCF~~PDF (Go Reference Point)

This interface allows the ~~Policy Control Function~~Policy Decision Function (~~PCF~~PDF) to apply policy to the bearer usage in the GGSN.

The ~~Policy Control Function~~Policy Decision Function (~~PCF~~PDF) is a logical entity of the P-CSCF. If the ~~PCF~~PDF is implemented in a separate physical node, the interface between the ~~PCF~~PDF and the P-CSCF is not standardized.

6a.7.10 Reference Point CSCF – BGCF (Mi reference point)

This reference point allows the Serving CSCF to forward the session signalling to the Breakout Gateway Control Function for the purpose of interworking to the PSTN networks.

The Mi reference point is based on external specifications i.e. SIP [61].