

# Technical Specification Group Services and System Aspects **TSGS#14(01)0708**

Meeting #14, Kyoto, Japan, 17-20 December 2001

**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 #14.

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.

CR on Rel99 (v.3.4.0), 4 (v.4.3.0) and 5 (v. 5.4.0):

<b>S2 Tdoc #</b>	<b>Title</b>	<b>Spec</b>	<b>CR #</b>	<b>c a t</b>	<b>Rel</b>	<b>WI</b>
S2-013452	Deleting SIWF functionality	23.002	080	F	R99	TEI
S2-013453	Deleting SIWF functionality	23.002	081	A	Rel-4	TEI4
S2-013454	Deleting SIWF functionality	23.002	082	A	Rel-5	TEI5

CR on Rel-5 (input version is 5.4.0):

<b>S2 Tdoc #</b>	<b>Title</b>	<b>Spec</b>	<b>CR #</b>	<b>c a t</b>	<b>Rel</b>	<b>WI</b>
S2-012176	Editorial alignment of 23.002 on CSCF	23.002	070	D	Rel-5	IMS
S2-012207	Aligning MGW descriptions	23.002	072	D	Rel-5	IMS-CCR
S2-012775	Correction of abbreviation of CSCF	23.002	074	D	Rel-5	IMS-CCR
S2-013547	HSS section clean up	23.002	075r2	C	Rel-5	IMS-CCR
S2-013455	Correction of Gi reference point definition	23.002	079	F	Rel-5	TEI

**3GPP TSG SA WG2**  
**Cancun, Mexico, 26-30/11/2001**

**S2-013452**

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## CHANGE REQUEST

⌘ **23.002 CR 080** ⌘ rev        ⌘ Current version: **3.4.0** ⌘

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

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

<b>Title:</b>	⌘ Deleting SIWF functionality		
<b>Source:</b>	⌘ MCC		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 21.11.2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ REL-99
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)	

<b>Reason for change:</b>	⌘ TSG CN #13 informed S2#20 that they agreed to remove the S-IWF from their Specifications (see S2-012722). Consequently, S2#20 took the action to delete it from its Specs. This CR is part of this action.
<b>Summary of change:</b>	⌘ The Shared Interworking Function entities (S-IWFC and S-IWFC) and associated text are removed.
<b>Consequences if not approved:</b>	⌘ Inconsistencies between Stage 3 and Stage 2 Specifications.

<b>Clauses affected:</b>	⌘ 2, 4a.2 (deleted), 6a.2 (deleted)		
<b>Other specs affected:</b>	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ 23.054, 21.102, 29.002, 23.003	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

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## 2 References

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- [4] [void]
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- [14] GSM 08.02: "Digital cellular telecommunications system (Phase 2+); Base Station System - Mobile-services Switching Centre (BSS - MSC) interface Interface principles".
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- [17] GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface - Layer 3 specification".
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- [25] GSM 08.61: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors (half rate)".
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\*\*\* Next change\*\*\*

## 4a.2 (void) ~~The Shared InterWorking Function (SIWF) entity~~

~~Shared InterWorking Function (SIWF) is a network function that provides interworking for data/fax calls. SIWF consists of a SIWF Controller (SIWFC) functionality located in MSCs and SIWF Server(s) (SIWFS) located in the PLMN. An SIWFS contains IWF capabilities as described in subclause 4.1.2.3. An SIWFS can be accessed by several other network nodes e. g. any MSC in the same PLMN.~~

~~More information is provided in GSM 03.54.~~

\*\*\* Next change \*\*\*

## 6a.2 (void) ~~SIWFS-specific interface~~

### ~~6a.2.1 Interface between MSC and SIWFS (K-Interface)~~

~~The K interface is used between MSC and SIWFS and is specified in GSM Technical specification 03.54.~~

**3GPP TSG SA WG2**  
**Cancun, Mexico, 26-30/11/2001**

**S2-013453**

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# CHANGE REQUEST

⌘ **23.002 CR 081** ⌘ rev        ⌘ Current version: **4.3.0** ⌘

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

<b>Title:</b>	⌘ Deleting SIWF functionality		
<b>Source:</b>	⌘ MCC		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 21.11.2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)	

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<b>Clauses affected:</b>	⌘ 2, 4a.2 (deleted), 6a.2 (deleted)	
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- [34] 3GPP TR 41.001: "GSM Release specifications".
- [35] 3GPP TS 43.051: "GERAN Overall Description, Stage 2".

\*\*\* next Change \*\*\*

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**S2-013454**

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## CHANGE REQUEST

⌘ **23.002 CR 082** ⌘ rev        ⌘ Current version: **5.4.0** ⌘

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- [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 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."

\*\*\* Next Change \*\*\*

## 4a.2 ~~(void) The Shared InterWorking Function (SIWF) entity~~

~~Shared InterWorking Function (SIWF) is a network function that provides interworking for data/fax calls. SIWF consists of a SIWF Controller (SIWFC) functionality located in MSCs and SIWF Server(s) (SIWFS) located in the PLMN. An SIWFS contains IWF capabilities as described in subclause 4.1.2.3. An SIWFS can be accessed by several other network nodes e. g. any MSC in the same PLMN.~~

~~More information is provided in GSM 03.54.~~

\*\*\* Next Change \*\*\*

## 6a.2 ~~(void) SIWFS-specific interface~~

### 6a.2.1 ~~Interface between MSC and SIWFS (K-Interface)~~

~~The K interface is used between MSC and SIWFS and is specified in GSM Technical specification 03.54.~~

**Source:** Motorola  
**Title:** Alignment of correct CSCF terminology  
**Agenda item:** R5 – 23.002  
**Document for:** DISCUSSION, DECISION

---

### **Introduction/Discussion**

There is an inconsistency in the usage of CSCF in 3GPP TS23.228v5.1.0 and TS23.002v5.3.0. In TS23.228 section 3.3 Abbreviation the CSCF is defined as Call Session Control Function, but in TS23.002 section 4a.7.1 the CSCF is defined as Call State Control Function. This contribution proposed to align the two specs with correct terminology. Attached is the CR to align 23.002 with the terminology in 23.228.

Other specs that need alignments are:

23.221v5.1.0 section 3.3 Abbreviation

Change the Call/Session Control Function to Call Session Control Function

23.228v5.1.0 section 3.3 Abbreviation

Remove the question mark after Call Session Control Function

### **Proposal**

It is recommended S2 accepted the proposed CR.

CR-Form-v4

## CHANGE REQUEST

⌘ **23.002 CR 070** ⌘ ev **-** ⌘ Current version: **5.3.0** ⌘

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

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

<b>Title:</b>	⌘ Alignment of CSCF terminology with TS23.228		
<b>Source:</b>	⌘ Motorola		
<b>Work item code:</b>	⌘ IMS	<b>Date:</b>	⌘ 8/27/2001
<b>Category:</b>	⌘ <b>D</b>	<b>Release:</b>	⌘
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>2</b> (GSM Phase 2)	
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R96</b> (Release 1996)	
	<b>B</b> (addition of feature),	<b>R97</b> (Release 1997)	
	<b>C</b> (functional modification of feature)	<b>R98</b> (Release 1998)	
	<b>D</b> (editorial modification)	<b>R99</b> (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP <a href="http://www.3gpp.org/Specs/TR_21.900">TR 21.900</a> .		<b>REL-4</b> (Release 4)
			<b>REL-5</b> (Release 5)

<b>Reason for change:</b>	⌘ To use consistent terminology of CSCF in 3GPP stage 2 specifications		
<b>Summary of change:</b>	⌘ Adopted the CSCF terminology in TS23.228 for TS23.002		
<b>Consequences if not approved:</b>	⌘ Inconsistence of terminology usage in 3GPP specs		

<b>Clauses affected:</b>	⌘ 4a.7.1 Call State Control Function (CSCF)		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

### 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](http://www.3gpp.org/3G_Specs/CRs.htm). Below is a brief summary:

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

| 4a.7.1 Call ~~State~~Session Control Function (CSCF)



## CHANGE REQUEST

⌘ **23.002 CR 072** ⌘ rev **-** ⌘ Current version: **5.3.0** ⌘

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

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

<b>Title:</b>	⌘ Aligning MGW descriptions		
<b>Source:</b>	⌘ Siemens		
<b>Work item code:</b>	⌘ IMS-CCR	<b>Date:</b>	⌘ 2001-08-17
<b>Category:</b>	⌘ <b>D</b>	<b>Release:</b>	⌘ REL-5
	Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)

<b>Reason for change:</b>	⌘ CR046 introduced a change to the MGW description in sub-clause 4.1.2.1.2. This change was not reflected in the IM-MGW description in sub-clause 4a.7.3.
<b>Summary of change:</b>	⌘ The text "i.e. DSOs" is deleted. (the text meant DS0s, however, DS0s do not apply to all 3GPP organisational partners, therefor CR046 removed the reference to DS0s.)
<b>Consequences if not approved:</b>	⌘ An error would remain in 23.002.

<b>Clauses affected:</b>	⌘ 4a.7.3		
<b>Other specs affected:</b>	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

**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](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.
- 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.

### 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 (i.e., DSOs) 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 may be required to support additional codecs and framing protocols, etc.

October 29 - November 2, 2001

Kobe, Japan

CR-Form-v3

## CHANGE REQUEST

⌘ **23.002 CR 074** ⌘ rev **-** ⌘ Current version: **5.4.0** ⌘

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

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

<b>Title:</b>	⌘ Correction of abbreviation of CSCF				
<b>Source:</b>	⌘ Ericsson				
<b>Work item code:</b>	⌘ IMS-CCR	<b>Date:</b>	⌘ 26/10/2001		
<b>Category:</b>	⌘ <b>D</b>	<b>Release:</b>	⌘ REL-5		
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)			

<b>Reason for change:</b>	⌘ Align abbreviations between 23.228 & 23.002				
<b>Summary of change:</b>	⌘ CSCF is Call Session Control Function				
<b>Consequences if not approved:</b>	⌘ Inconsistent abbreviation				

<b>Clauses affected:</b>	⌘ 4.a.7				
<b>Other specs Affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘			
<b>Other comments:</b>	⌘				

October 29 - November 2, 2001

Kobe, Japan

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

### 4a.7.1 Call Session~~State~~ 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; 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].

**3GPP TSG-SA WG2 meeting #21**  
**Cancun, Mexico, 26<sup>th</sup> – 30<sup>th</sup> November 2001**

**Tdoc S2-013457**

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**3GPP TSG-CN1 Meeting #20bis**  
**Seattle, Washington, USA, 13.-15. November 2001**

***Tdoc N1-011763***

**Title:** Liaison Statement on configuration hiding between S-CSCF and MGCF  
**Source:** CN1  
**To:** SA2  
**Cc:**

**Contact Person:**

**Name:** Keith Drage  
**Tel. Number:** +44 7799658151  
**E-mail Address:** [drage@lucent.com](mailto:drage@lucent.com)

**Attachments:** None

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**1. Overall Description:**

CN1 is writing SIP procedural text for the THIG function. TS 23.228 describes that the configuration of the network, in particular the number of S-CSCFs needs to be hidden. The S-CSCF and MGCF may be in different networks, and thus hiding should appear between these two entities.

The only functionality that describes provision of the THIG function at the moment is the I-CSCF. Reading TS 23.002 and TS 23.228 it is apparently not possible to insert an I-CSCF between S-CSCF and MGCF.

The BGCF does appear between these two entities. The BGCF has no description for providing THIG.

**2. Actions:**

**To SA2 group.**

**ACTION:** CN1 asks SA2 whether configuration hiding of S-CSCFs is required between S-CSCF and MGCF when they are in different networks, and which entity provides that functionality. Appropriate clarifications are requested in TS 23.228.

**3. Date of Next CN1 Meetings:**

CN1_21	26th – 30th November 2001	Cancun, Mexico.
CN1_SIPadhoc	14th – 18th January 2002	Phoenix, USA

## CHANGE REQUEST

⌘ **23.002 CR 79** ⌘ rev **-** ⌘ Current version: **5.4.0** ⌘

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

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

<b>Title:</b>	⌘ Correction of Gi reference point definition		
<b>Source:</b>	⌘ Siemens		
<b>Work item code:</b>	⌘ IMS-CCR	<b>Date:</b>	⌘ 16/11/2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ REL-5
	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (Addition of feature),  <b>C</b> (Functional modification of feature)  <b>D</b> (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><b>2</b> (GSM Phase 2)  <b>R96</b> (Release 1996)  <b>R97</b> (Release 1997)  <b>R98</b> (Release 1998)  <b>R99</b> (Release 1999)  <b>REL-4</b> (Release 4)  <b>REL-5</b> (Release 5)</p>

<b>Reason for change:</b>	⌘ When introduced for GPRS the Gi was rather seen as the interface to external packet data networks. Meanwhile the architecture extended and the GGSN interfaces not only to external networks but also to intra operator backbones and thereby to other PLMN entities like application servers or IMS nodes.  The description shall reflect this. And, throughout chapter 7 reference point shall replace interface.
<b>Summary of change:</b>	⌘ Clarification of the Gi as a reference point between GGSN and packet data networks
<b>Consequences if not approved:</b>	⌘ Confusion about Gi usage and whether the GGSN may connect to operator internal packet data networks or not

<b>Clauses affected:</b>	⌘ 7	
<b>Other specs Affected:</b>	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	

## 7 Reference points between the PLMN and other ~~Interface to external networks~~

The reference points between the PLMN and other ~~interfaces with fixed~~ networks, including dedicated networks, are described in the 09-series of GSM Technical Specifications and in the 29-series of ~~TS~~ Technical Specifications.

### 7.1 Reference point ~~Interface between the~~ fixed networks ~~and~~ the MSC

The MSC is based on a normal ISDN exchange. It has, for call control, the same reference points ~~interface~~ as the fixed network exchanges. The signalling reference point ~~interface~~ considered in the GSM Technical Specifications is related to the signalling system No. 7 User Parts TUP and ISUP associated to the circuits used for incoming and outgoing calls.

### 7.2 Reference point ~~Interface between~~ GGSN ~~and~~ packet ~~external~~ data networks (Gi reference point ~~interface~~)

This is the reference point between the GGSN and a packet data network. ~~interface connects the PLMN to~~ It may be an operator external public or private packet data network or an intra operator packet data network, e.g. for provision of IMS services.

### 7.3 Reference point ~~Interface between~~ GMLC ~~and~~ external LCS Client (Le reference point ~~interface~~)

~~At this~~ reference point ~~interface connects the PLMN to the~~ external LCS Clients request services from the PLMN.