TSGS#27(05) 0257

Source: **SA3**

Title: **CRs to 33.107 on Lawful interception architecture and functions (Rel-7)**

Document for: **Approval**

Agenda Item: **7.3.3**

Meeting	SA Doc	TS No.	CR No	Rev	Rel	Cat	Subject	Vers. Current	Vers New	SA1 Doc
SP-28	SP-050257	33.107	051	1	Rel-7	F	Clarifications for the usage of the notion of a service in distributed IP networks	6.4.0	7.0.0	S3-050316
SP-28	SP-050257	33.107	053	-	Rel-7	C	Correlation for IMS intercption	6.4.0	7.0.0	S3-050201

CR-Form-v7.1

CHANGE REQUEST

⌘ **33.107** **CR** **051** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Clarifications for the usage of the notion of a service in distributed IP networks
Source:	⌘	SA3 LI
Work item code:	⌘	SEC-LI
Date:	⌘	07/04/2005
Category:	⌘	**F**
Release:	⌘	**Rel-7**

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:
Ph2 *(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)*
Rel-7 *(Release 7)*

Reason for change: ⌘

3GPP 33.106 reads:

- (Subclause 5.1.2): 3GMS shall provide access to the intercepted Content of Communications (CC) and the Intercept Related Information (IRI) of the mobile target on behalf of Law Enforcement Agencies (LEAs).
- (Subclause 5.1.3): The requirement for lawful interception is that all telecommunications services for the 3GMS standards should be capable of meeting the requirements within this document.

Traditional telecommunication services allocating a dedicated channel for the data, which is primarily the voice data. Therefore, the telephony was the most common service. For traditional telecommunication networks the concept of service is rather simple. Hence, it is obvious and simple to decide how to implement the LI interception requirements as well.

In UMTS system however and especially when IMS is employed the notion of service and the respective interception concept are rather complex. Therefore these need certain clarifications.

Let's look into multimedia session setup through PS domain of UMTS network. There are number of multimedia applications (e.g. VoIP, PoC, video streaming, etc.) already available that need the establishment of such sessions. Operator may define many more in near future and offer these new services to the customers.

In order to set up a multimedia session UE and SCSF exchange SIP messages

		via SGSN. For SGSN these are mere IP packets. That is, SGSN cannot tell SIP message from any other type of data. Once the session is established the given application (e.g. VoIP) end points will start exchanging user plane data (RTP/IP packets) via SGSN. Once again, for SGSN these are mere IP packets, and SGSN has no knowledge what kind of data is inside these IP packets. The reason is that SGSN provides only IETF IP layer service, which routs IP packets for the given IETF application layer (e.g. VoIP service). Hence, in order to meet LI requirements SGSN must provide interception for network layer service only. By doing that SGSN operator would provide LI for e.g. VoIP application layer service as well, because there is no VoIP server node anywhere in the network.
Summary of change:	⌘	Necessary additions are offered to Definitions and to Abbreviations. Note 1 was inserted under clause 4 “Functional architecture”, which adds brief clarifications on the distinctions between IP layer services and application layer services, and respective interception matters.
Consequences if not approved:	⌘	Multiple interpretations how to meet the requirement to intercept telecommunication services provided to UMTS customers. This ambiguity may have negative implications on applying LI framework to upcoming services on top of UMTS networks.

Clauses affected:	⌘	2, 3 and 4.				
		Y	**N**			
Other specs affected:	⌘		**X**	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘					

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] ETSI TS 101 331: "Telecommunications security; Lawful Interception (LI); Requirements of Law Enforcement Agencies".

[2] ETSI ES 201 158: "Lawful Interception; Requirements for network functions".

[3] ETSI ES 201 671: "Handover Interface for the lawful interception of telecommunications traffic".

[4] GSM 01.33: "Lawful Interception requirements for GSM".

[5] GSM 02.33: "Lawful Interception - stage 1".

[6] GSM 03.33: "Lawful Interception - stage 2".

[7] 3GPP TS 33.106: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3G Security; Lawful Interception Requirements".

[8] ANSI J-STD-025-A: "Lawfully Authorised Electronic Surveillance".

[9] IETF RFC 2806: "URLs for Telephone Calls ".

[10] 3GPP TS 23.060: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General Packet Radio Service (GPRS); Service description".

[11] 3GPP TS 33.108: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3G Security; Handover interface for Lawful Interception".

[12] IETF RFC 3261: "SIP: Session Initiation Protocol".

[13] 3GPP TS 21.905: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications".

[14] 3GPP TS 23.234: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP system to Wireless Local Area Network (WLAN) Interworking; System Description".

[15] IETF RFC 1122: "Requirements for Internet Hosts -- Communication Layers".

[16] IETF RFC 1123: "Requirements for Internet Hosts -- Application and Support".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [13] and the following apply.

Application layer: As defined by Internet Engineering Task Force (IETF) in [16].

~~**Network Based Interception:** Interception that is invoked at a network access point regardless of Target Identity.~~

~~**Subject Based Interception:** Interception that is invoked using a specific Target Identity.~~

~~**Target Identity:** A technical identity that uniquely identifies a target of interception. One target may have one or several identities.~~

IP layer: As defined by Internet Engineering Task Force (IETF) in [15]

Interception Area: is a subset of the network service area comprised of a set of cells which defines a geographical zone.

Location Dependent Interception: is interception of a target mobile within a network service area that is restricted to one or several Interception Areas (IA).

Other LI specific definitions are given in 3GPP TS 33.108 [11].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [13] and the following apply:

3GPP MS	3rd Generation Mobile Communication System
3G GGSN	3rd Generation Gateway GPRS Support Node
3G GSN	3rd Generation GPRS Support Node (GGSN/SGSN)
3G MSC	3rd Generation Mobile Switching Center
3G SGSN	3rd Generation Serving GPRS Support Node
3G UMSC	3rd Generation Unified Mobile Switching Centre
AAA	Authentication, Authorization, and Accounting
ADMF	Administration Function
AN	Access Network
AP	Access Provider
BM-SC	Broadcast-Multicast Service Centre
CC	Content of Communication
CS	Circuit Switched
CSCF	Call Session Control Function
DF	Delivery Function
ECT	Explicit Call Transfer
FTP	File Transfer Protocol
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
GSN	GPRS Support Node (SGSN or GGSN)
HI	Handover Interface
IA	Interception Area
ICEs	Intercepting Control Elements (3G MSC Server, 3G GMSC Server, P-CSCF, S-CSCF, SGSN, GGSN, HLR, AAA Server, PDG
IETF	Internet Engineering Task Force
IMEI	International Mobile station Equipment Identity
IMS	IP Multimedia Core Network Subsystem
IMSI	International Mobile Subscriber Identity

INEs	Intercepting Network Elements (3G MSC Server, 3G GMSC Server, P-CSCF, S-CSCF, SGSN, GGSN, MGW, HLR, AAA Server, PDG)
IP	Internet Protocol
IRI	Intercept Related Information
I-WLAN	Interworking WLAN (3GPP WLAN interworking subnetwork)
LAN	Local Area Network
LDI	Location Dependent Interception
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
MBMS	Multimedia Broadcast/Multicast Service
MSISDN	Mobile Subscriber ISDN Number
NO	Network Operator
PDG	Packet Data Gateway
PoC	Push to talk over Cellular
PS	Packet Switched
RA	Routing Area
RAI	Routing Area Identity
SAI	Service Area Identity
SGSN	Serving GPRS Support Node
SIP	Session Initiation Protocol
SMS	Short Message Service
TEL URL	"tel" URL, as defined in [9]
UE	User Equipment
UMTS	Universal Mobile Telecommunication System
URI	Universal Resource Identifier
URL	Universal Resource Locator
VoIP	Voice over IP
WLAN	Wireless LAN

4 Functional architecture

The following figures contain the reference configuration for the lawful interception. The circuit-switched configuration is shown in figure 1a. The packet-switched configuration is shown in figure 1b. Intercept configurations for HLR and IMS are shown in figures 1c and 1d. The WLAN interworking configuration is shown in figure 1e. The various entities and interfaces are described in more detail in the succeeding clauses.

PS domain of the UMTS system (GSN and Multimedia Packet Data services) and 3GPP-WLAN interworking network provide UMTS/GSM customer's mobile equipment (UE) with connectivity service to another end of the communication. Another end of the communication may be a network element (server) or another UE. Therefore, UMTS system provides IP layer [15] services. Hence, UMTS NO/AP is responsible only for IP layer interception of CC data. In addition to CC data, the LI solution for UMTS offers generation of IRI records from respective control plane (signalling) messages. The IP layer connectivity service is needed to support application layer [16] service provision to UMTS/GSM customers. For instance, the following are examples of application layer services: email service; web browsing service, FTP service, audio services (e.g. VoIP, PoC), other multimedia services (MBMS, video telephony), etc. Majority of the application layer services require addition of respective server functionality to the network. Note that it is not necessary that such application layer SP should be the same commercial entity as the UMTS AP/NO in question.

NOTE 1: For instance in MBMS a BM-SC and especially content providing server may be operated by different commercial entity than UMTS network.

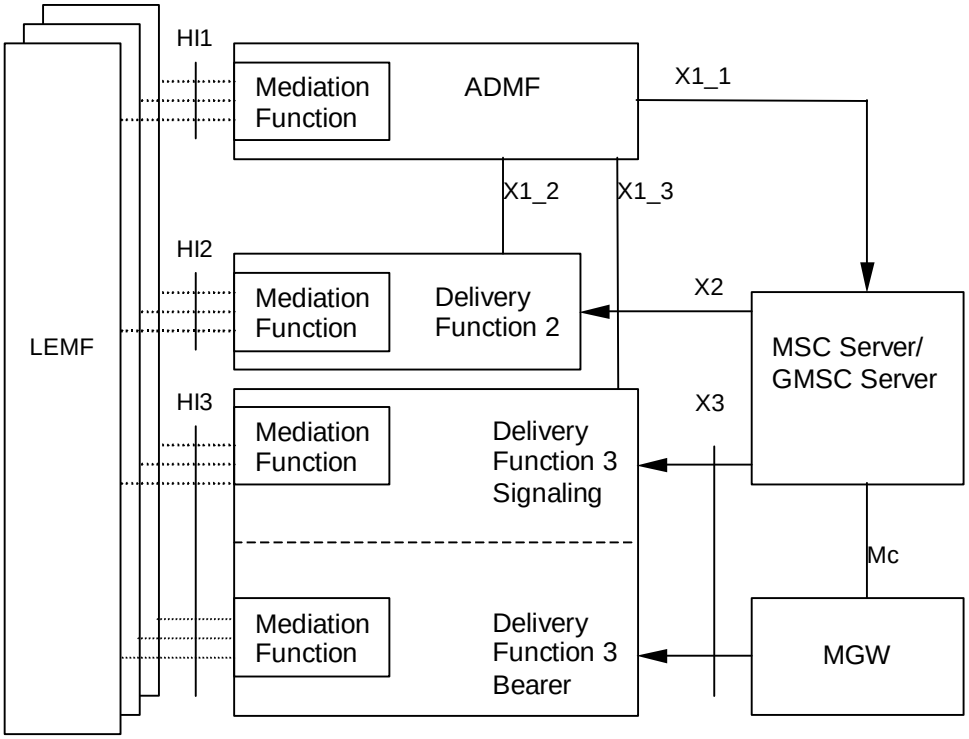

Figure 1a: Circuit switched intercept configuration

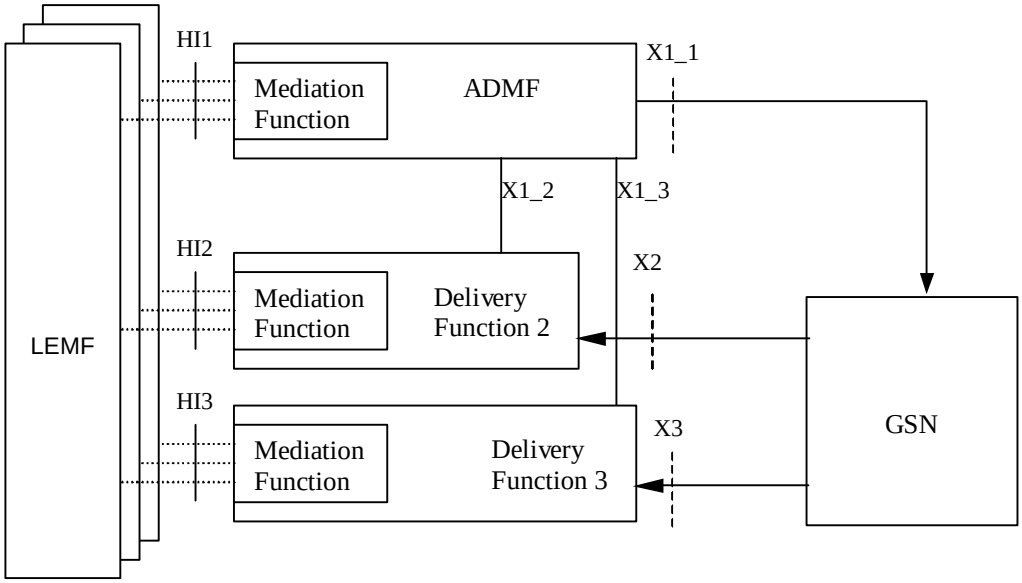

Figure 1b: Packet Switched Intercept configuration

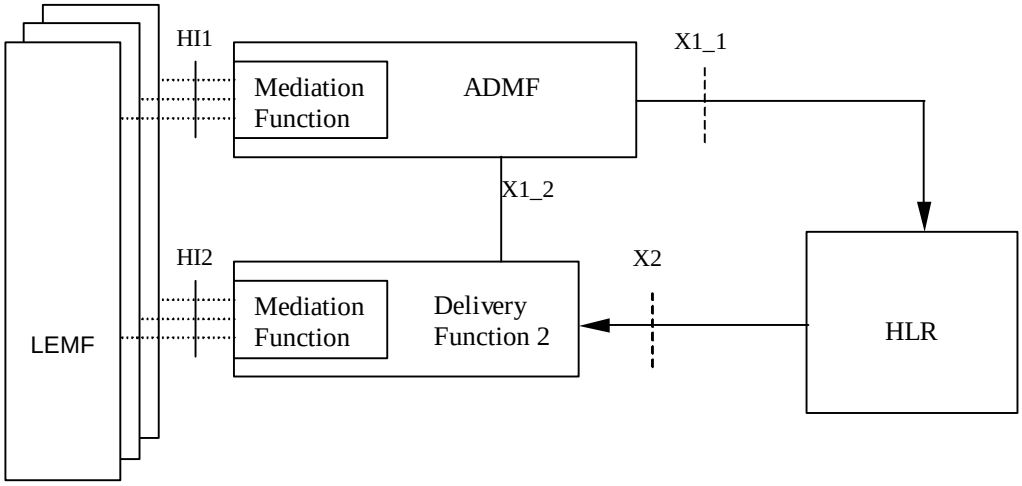

Figure 1c: HLR Intercept configuration

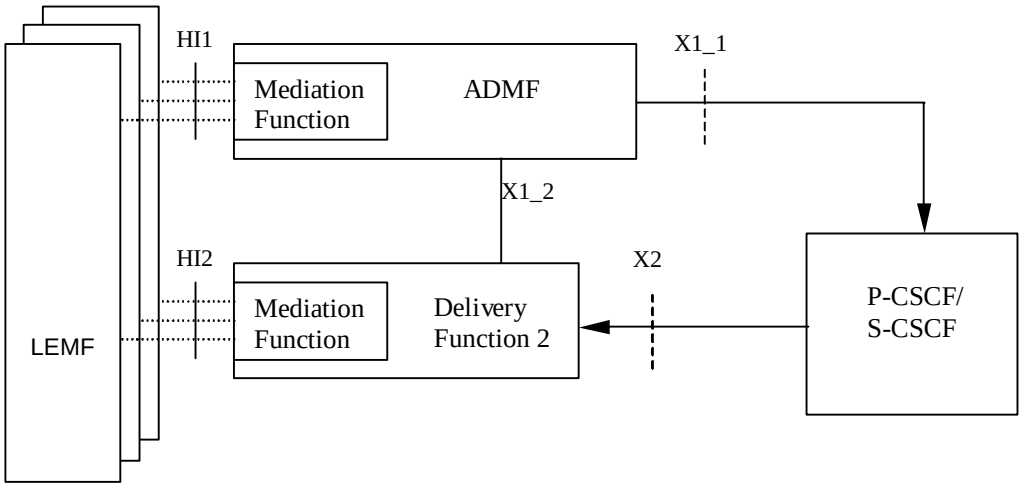

Figure 1d: IMS-CSCF Intercept configuration

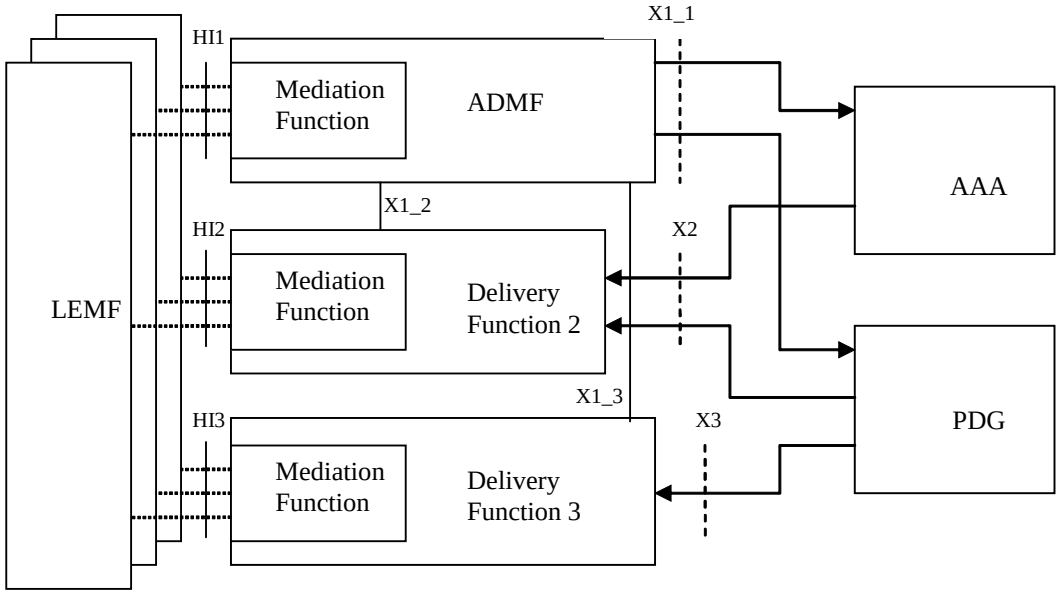

Figure 1e: WLAN Interworking Intercept configuration

The reference configuration is only a logical representation of the entities involved in lawful interception and does not mandate separate physical entities. This allows for higher levels of integration.

Regional Mediation Functions, which may be transparent or part of the administration and delivery functions, are used to convert information on the HI1, HI2 and HI3 interfaces in the format described in various national or regional specifications. For example, if ES 201 671 [3] or J-STD-025 [8] is used, then the adaptation to HI1, HI2 and HI3 will be as defined in those specifications.

There is one Administration Function (ADMF) in the network. Together with the delivery functions it is used to hide from the 3G ICEs that there might be multiple activations by different Law Enforcement Agencies (LEAs) on the same target. The administration function may be partitioned to ensure separation of the provisioning data from different agencies.

See the remaining clauses of this document for definitions of the X1_1, X1_2, X1_3, X2 and X3 interfaces.

Interception at the Gateways is a national option.

In figure 1a DF3 is responsible for two primary functions:

- Call Control (Signalling) for the Content of Communication (CC); and
- Bearer Transport for the CC.

HI3 is the interface towards the LEMF. It must be able to handle the signalling and the bearer transport for CC.

In figures 1a, 1b and 1e, the HI2 and HI3-interfaces represent the interfaces between the LEA and two delivery functions. The delivery functions are used:

- to distribute the Intercept Related Information (IRI) to the relevant LEA(s) via HI2 (based on IAs, if defined);
- to distribute the Content of Communication (CC) to the relevant LEA(s) via HI3 (based on IAs, if defined).

In figures 1c and 1d the HI2 interface represents the interface between the LEA and the delivery function. The delivery function is used to distribute the Intercept Related Information (IRI) to the relevant LEA(s) via HI2.

NOTE 2~~1~~:With reference to figure 1c, CC interception does not apply to HLR.

NOTE 3~~2~~: For IMS, figure 1d relates to the provision of IRI for SIP messages handled by the CSCF. Interception of CC for this case can be done at the GSN under a separate activation and invocation, according to the architecture in Figure 1b (see also clause 7.A.1).

TSG-SA WG1 #38 **S3-050201**
Geneva, Switzerland, 26th to 29th April 2005 **Agenda Item:**

3GPP TSG-SA 3 LI Meeting #17 ***Tdoc S3LI05_045r3***
Sophia Antipolis, France, 05 – 07. April 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **33.107** **CR** **053** ⌘ **rev** **-** ⌘ Current version: **6.4.0** ⌘

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

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

Title:	⌘	Correlation for IMS intercption
Source:	⌘	SA 3 LI
Work item code:	⌘	SEC1-LI
Date:	⌘	6/04/2005
Category:	⌘	**C**
Release:	⌘	Rel-7

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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	No definition for correlation of LI within IMS
Summary of change:	⌘	Clarification for correlation for SIP communication
Consequences if not approved:	⌘	Different interpretation leads to different implementation

Clauses affected:	⌘	7.A.3

Other specs affected:	⌘	Y	N		⌘
			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.

7A Invocation of Lawful Interception for Packet Data Multi-media Service

7A.1 Provision of content of communications

Interception of the content of communications for GSN packet data services is explained in clause 7.2. No additional content of communications intercept requirements are identified. (to be confirmed pending completion of multi-media stage 2 specifications) Activation and invocation of multi-media service does not produce interception of content of communications, which must be intercepted at the GSN under a separate activation and invocation.

7A.2 Provision of IRI

SIP messaging is reported as Intercept Related Information for the interception of multi-media service. As shown in figure 22 below, all SIP messages executed on behalf of a target subscriber are subject to intercept at the P CSCF and S CSCF. Based upon network configuration, the ADMF shall provision P CSCFs, or S CSCFs, or both P CSCFs and S CSCFs with SIP URI or TEL URL target identifiers. These resulting intercepted SIP messages shall be sent to DF2 for mediation prior to transmittal across the HI2 interface.

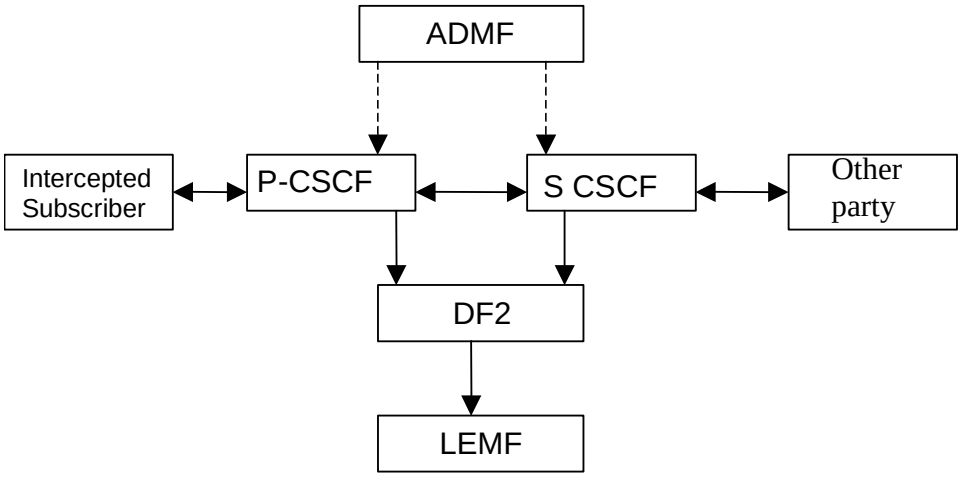

Figure 22: Provision of Intercept Related Information for multi-media

7A.3 Multi-media events

- All SIP messages to or from a targeted subscriber, and all SIP messages executed on behalf of a targeted subscriber for multi-media session control are intercepted by the P CSCF and S CSCF and sent to DF2. The target identifier used to trigger the intercept will also be sent with the SIP message. P CSCF event reports may be redundant with S CSCF event reports when the P CSCF and S CSCF reside in the same network, however, this standard does not require nor prohibit redundant information from being reported to DF2.

- The IRI should be sent to DF2 with a reliable transport mechanism.

- ~~The use of a~~ Ce~~orrelation ID~~) for SIP to bearer ~~correlation~~ shall ~~is~~ be supported within the domain of one provider. ~~not defined in this release.~~

- An intercepted SIP event sent to DF2 is shown below:
  - Observed SIP URI
  - Observed TEL URL
  - Event Time and Date
  - Network element identifier
  - SIP Message Header
  - SIP Message Payload

7A.4 Multi-media Call State Control Service Scenarios

Annex C shows examples of the delivery of intercepted events and product under various call scenarios.

7A.5 Push to talk over Cellular (PoC)

PoC is a service of the IMS Domain and interception is done according the definitions in clause 7A.3. Interception of CC is available with the current implementations in the GSNs.