

## CHANGE REQUEST

33.107 CR CR-Num rev - Current version: Initial draft for R00

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

<b>Title:</b>	Lawful Interception for CS domain		
<b>Source:</b>	Ericsson		
<b>Work item code:</b>	1331	<b>Date:</b>	2001-01-16
<b>Category:</b>	<b>B</b>	<b>Release:</b>	REL-4
	<p><i>Use <u>one</u> of the following categories:</i></p> <p><b>F</b> (essential correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (Addition of feature),</p> <p><b>C</b> (Functional modification of feature)</p> <p><b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	<p><i>Use <u>one</u> of the following releases:</i></p> <p><b>2</b> (GSM Phase 2)</p> <p><b>R96</b> (Release 1996)</p> <p><b>R97</b> (Release 1997)</p> <p><b>R98</b> (Release 1998)</p> <p><b>R99</b> (Release 1999)</p> <p><b>REL-4</b> (Release 4)</p> <p><b>REL-5</b> (Release 5)</p>	

<b>Reason for change:</b>	3GPP Release 4 architecture
<b>Summary of change:</b>	
<b>Consequences if not approved:</b>	

<b>Clauses affected:</b>	3.2, 4, 6, 6.1, 6.1.1, 6.1.2	
<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>		

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

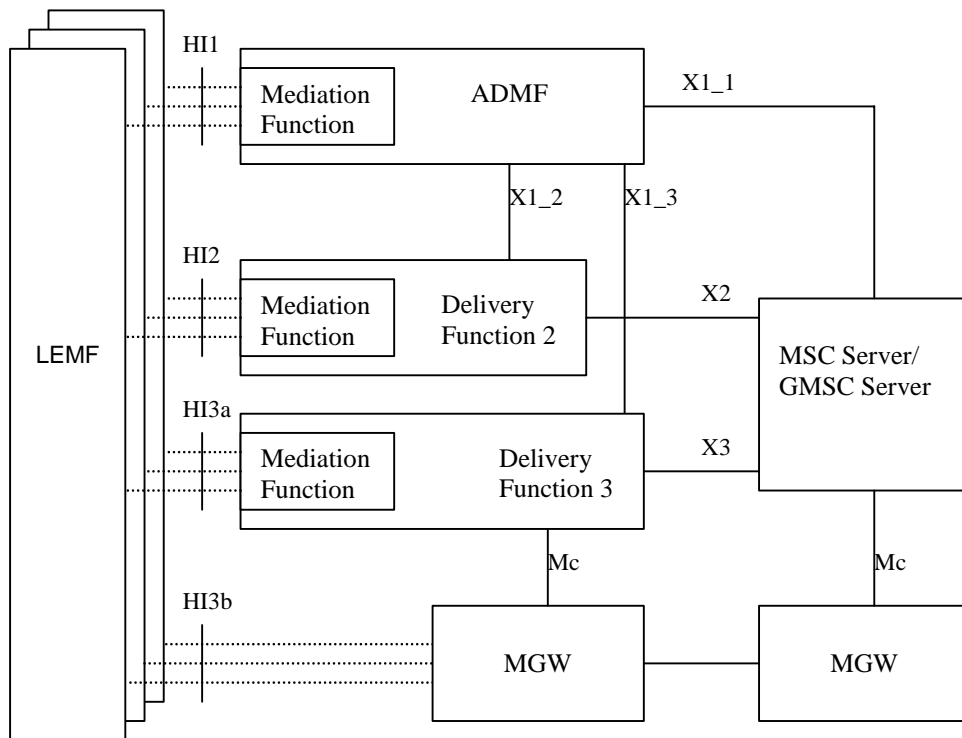
3GMS	3rd Generation Mobile Communication System
3G GGSN	3rd Generation Gateway GPRS Support Node
3G GSN	3rd Generation GPRS Support Node (GGSN/SGSN)
3G MSC	3rd Generation Mobile Switching Center (MSC, GMSC)
3G SGSN	3rd Generation Serving GPRS Support Node
3G UMSC	3rd Generation Unified Mobile Switching Centre
ADMF	Administration Function
CC	Content of Communication
CGI	Cell Global Identity
DF	Delivery Function
ECT	Explicit Call Transfer
GPRS	General Packet Radio Service
HI	Handover Interface
IA	Interception Area
IP	Internet Protocol
IRI	Intercept Related Information
LDI	Location Dependent Interception
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
INEs	Intercepting Network Elements (such as SGSN, MSC Server, GMSC Server, MGW, P CSCF, S CSCF)
MGW	Media Gateway
RA	Routing Area

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## 4 Functional architecture

### 4.1 Functional architecture for circuit switched services

The following picture contains the reference configuration for the lawful interception. The various entities and interfaces are described in more detail in the succeeding subclauses.



**Figure 1a: Reference configuration for circuit switched services**

The reference configuration is only a logical representation of the entities and interfaces involved in lawful interception and does not mandate separate physical entities and interfaces. 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 or J-STD-25 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 INEs 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.

The HI2 and HI3a-interfaces represent the interfaces between the LEA and two delivery functions. The HI3b-interface represent the interface between the LEMF and MGW. The Mc-interface between the DF3 and MGW is used to handle the bearers towards the LEA(s). The Mc-interface between the MSC server and MGW is used to handle the bearer towards the MGW controlled by DF3.

The delivery functions are used:

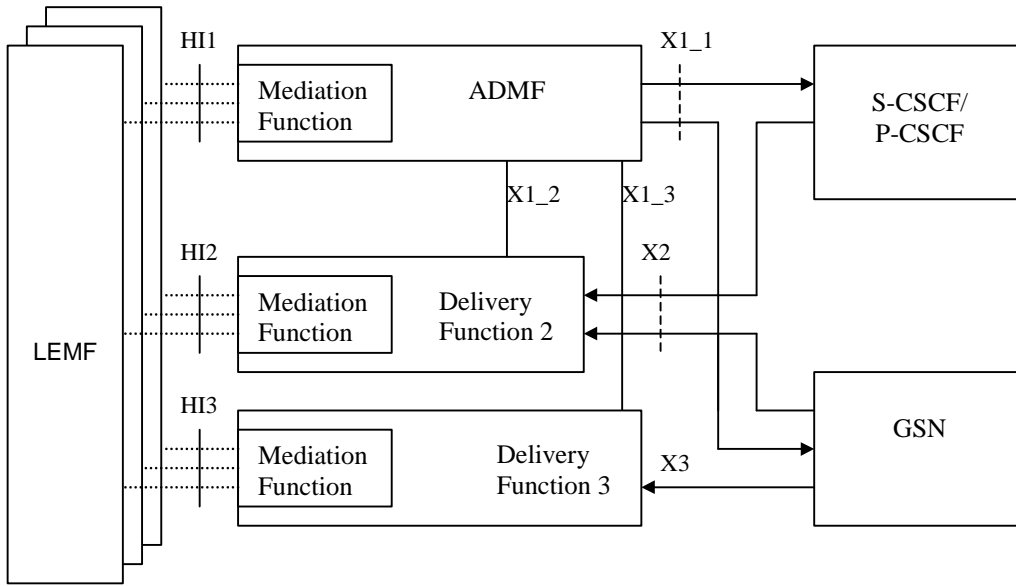
- to distribute the Intercept Related Information (IRI) to the relevant LEA(s) via HI2 (based on IA, if defined);
- to distribute the Content of Communication (CC) to the relevant LEA(s) via HI3b (based on IAs, if defined).

See the remaining sections of this document for definitions of the X1\_1, X1\_2, X1\_3, X2 and X3 interfaces.

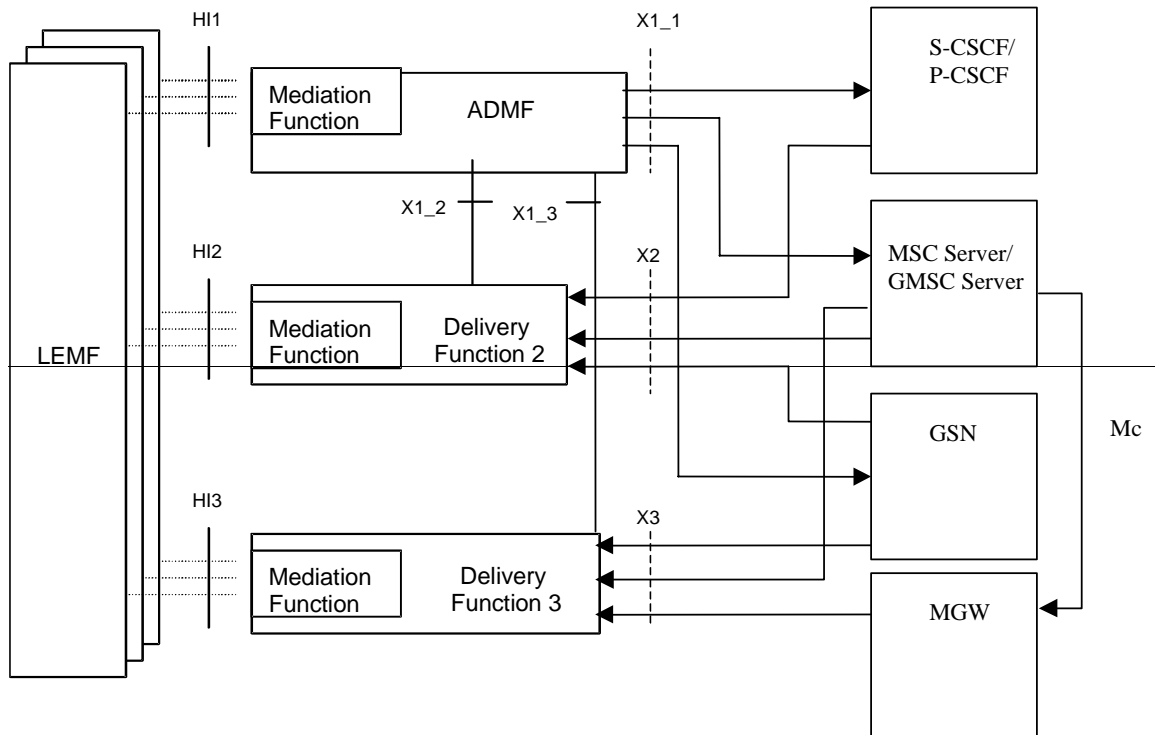
Interception at the Gateways is a national option.

## 4.2 Functional architecture for packet data services

The following picture contains the reference configuration for the lawful interception. The various entities and interfaces are described in more detail in the succeeding subclauses.



**Figure 1b: Reference configuration for packet data services**



**Figure 1: Reference configuration**

Editor’s note: functional definition of DF3 (control and bearer functions) is for further study.

The reference configuration is only a logical representation of the entities and interfaces involved in lawful interception and does not mandate separate physical entities and interfaces. 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 or J-STD-25 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 INEs 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.

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).

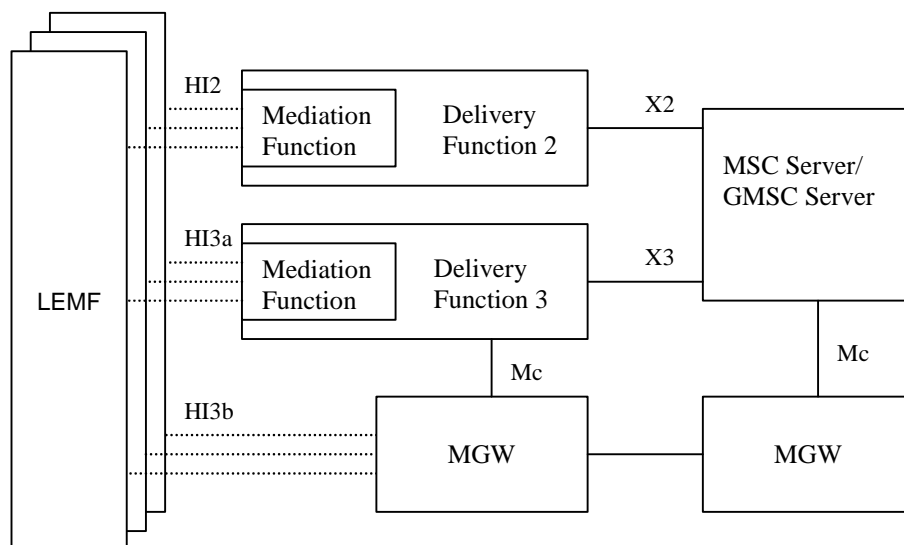
See the remaining sections of this document for definitions of the X1\_1, X1\_2, X1\_3, X2 and X3 interfaces.

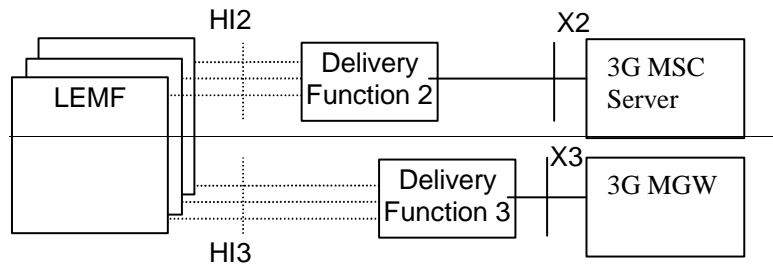
Interception at the Gateways is a national option.

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

## 6 Invocation of Lawful Interception for Circuit Switched Services

Figure 11 shows an extraction from the reference configuration in figure 1a which is relevant for the invocation of the lawful interception.





**Figure 11: Functional model for Lawful Interception invocation**

Editors note: update picture.

The HI2 and HI3a interfaces represent the interfaces between the LEMF and two delivery functions. The HI3b-interface represent the interface between the LEMF and MGW. These Both interfaces are e-subject to national requirements. They are included for completeness, but are beyond the scope of standardization in this document.

The delivery functions 2 is are used:

- to convert the information on the X2-interface to the corresponding information on the HI2-interface;
- ~~to convert the information on the X3-interface to the corresponding information on the HI3-interface;~~
- to distribute the intercept related information to the relevant LEA(s) (based on IAs, if defined);
- ~~to distribute the intercept product to the relevant LEA(s) (based on IAs, if defined).~~

The delivery function 3 is used:

- to convert the information on the X3-interface to the corresponding information on the HI3a-interface;
- to handle the bearers towards the LEA(s) via the Mc-interface.

In case a call is selected based on several identities (MSISDN, IMSI, IMEI) of the same target, the 3G MSC will deliver ~~CC and IRI only once~~ to the DF2 and order the DF3 to set up the stublines only once. ~~DF2 and DF3 will then distribute the information and the DF3 will set up the stublines~~ to the relevant LEA that requested interception on a particular target identity.

For the delivery of the CC and IRI, the 3G MSC Server provides a correlation number and target identity to the DF2 and DF3 which is used there in order to select the different LEAs to which the product shall be delivered.

NOTE: If interception has been activated for both parties of the call both CC and IRI will be delivered for each party as separate intercept activity.

For Location Dependent Interception, the location dependency check occurs at the establishment of each call. Subsequent dependency checks for simultaneous calls are not required, but can be a national option.

If a target is marked using an IA in the 3G MSC Server, the 3G MSC Server shall perform a location dependency check at call set-up. Only if the target's location matches the IA is call the intercepted.

If a target is marked using an IA in the DF2, the DF2 shall perform a location dependency check at reception of the first IRI for the call. Only if the target's location matches the IA for certain LEAs is IRI the relayed to these LEAs. All subsequent IRIs for the call are sent to the same LEAs.

If a target is marked using an IA in the DF3, the DF3 shall perform a location dependency check at reception of the CC. Only if the target's location matches the IA for certain LEAs is the CC relayed to these LEAs.

## 6.1 Provision of Intercept Product - Circuit Switched

Figure 12 shows the access method for the delivering of CC shall be bridged/ T-connection (see figure 12).

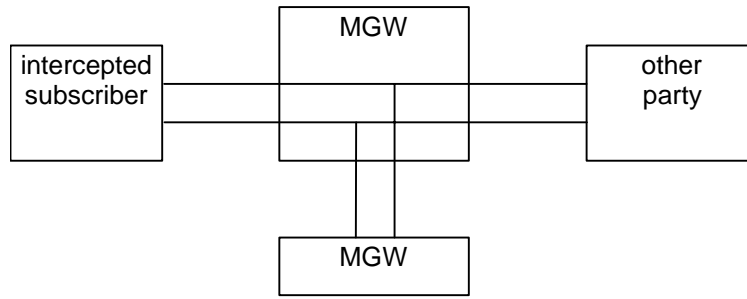
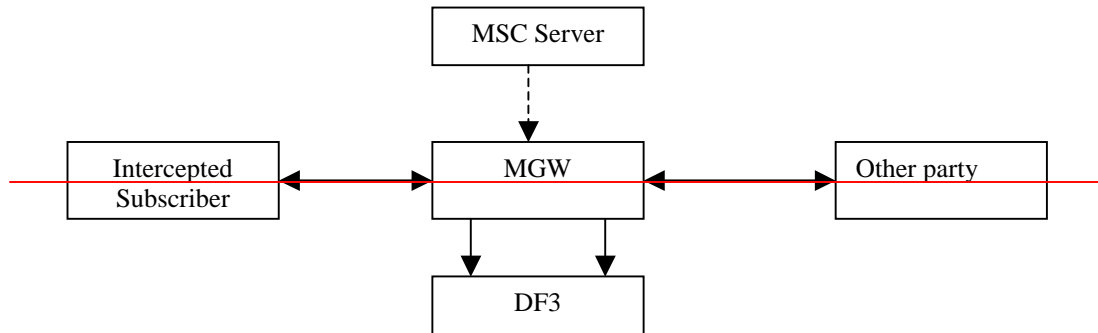


Figure 12: Bridged Acces



### 6.1.1 Delivery configuration to the LEMF

Figure 13 shows the configuration for circuit switched calls. The signals of both parties of the configuration to be intercepted are delivered separately to the requesting function LEMF. The ~~requesting~~ ~~delivery~~ function itself has no impact on the connection between the subscribers.

The two stublines towards the LEMF are established in parallel to the call set up. For both stublines the address is used which has been provided during activation.

NOTE: For data calls it is necessary to provide means for fast call establishment towards the LEMF so that it doesn't miss the beginning of the data transmission.

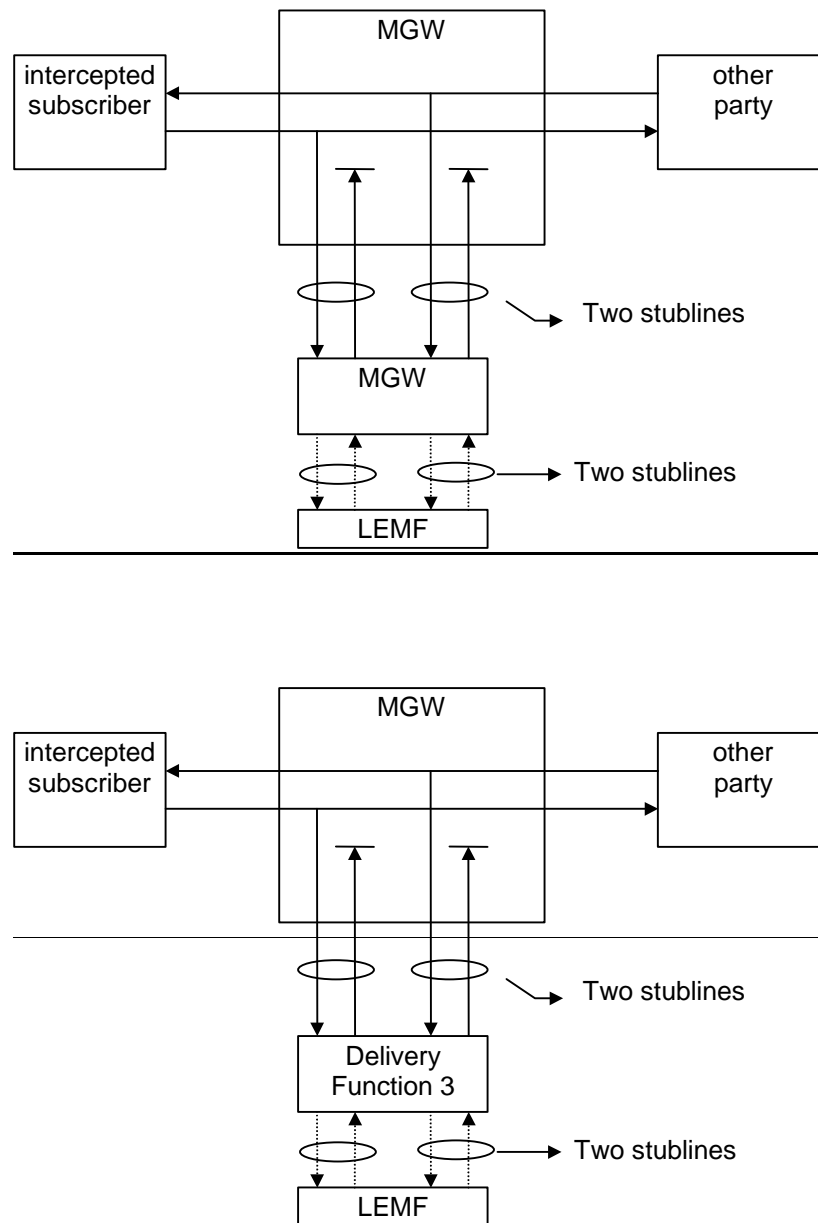


Figure 13: Delivery configuration to the LEMF for the interception of a circuit switched call

### 6.1b.2 X3-interface

The following information needs to be transferred from the 3G MSC Server (to be confirmed by S3 LI group) to the DF3 in order to allow the DF3 to perform its functionality:

- target identity (MSISDN, IMSI or IMEI); note 1
- 
- the target location (if available) or the IAs in case of location dependent interception. note 1
- correlation number (IRI <-> CC);
- direction indication – (Signal from target or signal to target); note 2



note 1: for DF3 internal use only

note 2: e.g. integer, CC from target = 1, CC from other party = 2

Additional information may be provided as national option.