DF2 to DF3 Communications

Spec: 3GPP TS 33.107v5.3.0

Release: Rel-5

Source: Telcordia Technologies & Federal Bureau of Investigation

Document for: Discussion & Action.

Summary

A number of needs have been identified in the last two 3GPP SA3 LI group meetings that can be met with the enabling of communications between DF3 and DF2. Such needs include the ability to support packet activity detection and IRI reporting, IMS media stream isolation, among others. The communication can be initiated by the DF2 or by the DF3.

For packet activity detection and IRI reporting, the DF3 could deliver a copy of the intercepted packets to the DF2. The DF2 along with the MF then could determine the associated IRI and can deliver it over the HI2 interface to the LEMF.

For IMS media stream isolation, the DF2 can provide the identity of the media stream to be isolated as viewed by the SIP signalling to the DF3. Having this information will enable the DF3 to isolate and deliver those media streams that are to be intercepted versus those that are not to be intercepted for a given interception order.

This contribution proposes changes to TS 33.107 to support a communication link between the DF2 and DF3.

CR-Form-v7

CHANGE REQUEST

⌘ **33.107** CR **CRNum** ⌘**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: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐   Core Network **X**

Title: ⌘	Changes to TS 33.107 to support communications between DF2 and DF3.	
Source: ⌘	Telcordia Technologies and Federal Bureau of Investigation	
Work item code:⌘	Security	***Date:*** ⌘ 24/09/2002
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: ⌘	A communications link between DF2 and DF3 is needed to allow for transfer of information to enable reporting of some IRI and content in particular scenarios.
Summary of change:⌘	Text is being added to the specification to address the need to support a communications link between DF2 and DF3.
Consequences if not approved: ⌘	Will not be able to support lawful interception needs that require communication between the DF2 and the DF3..

Clauses affected: ⌘	4, 5.1.2, 5.1.3, 7, and 7.5

	Y	N		
Other specs affected: ⌘			Other core specifications ⌘	
			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.
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.

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. The various entities and interfaces are described in more detail in the succeeding subclauses.
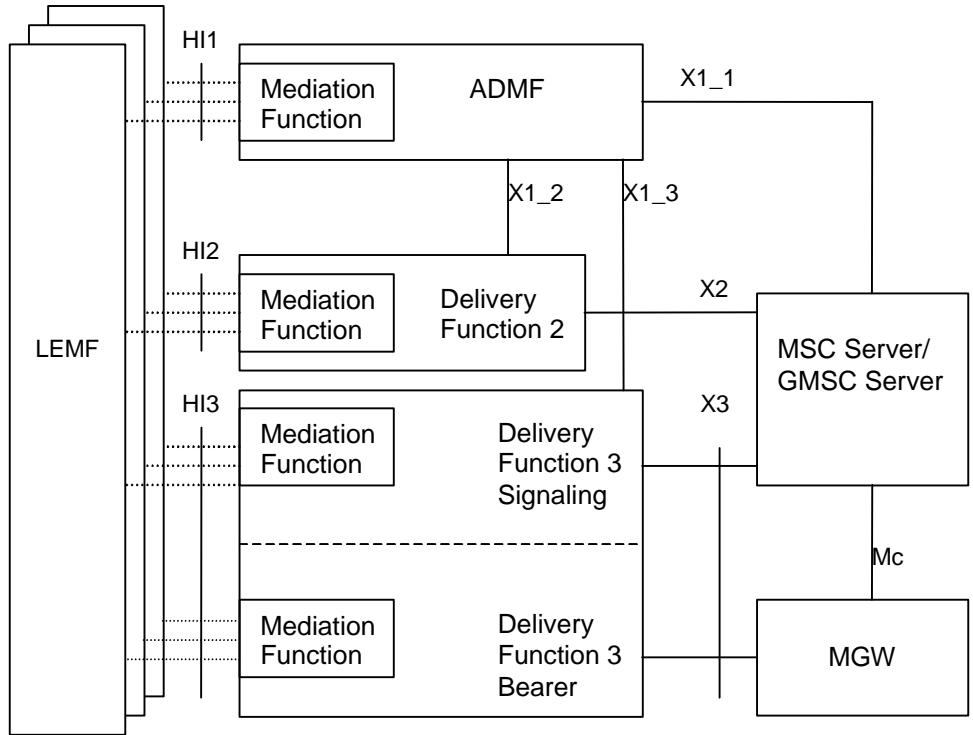
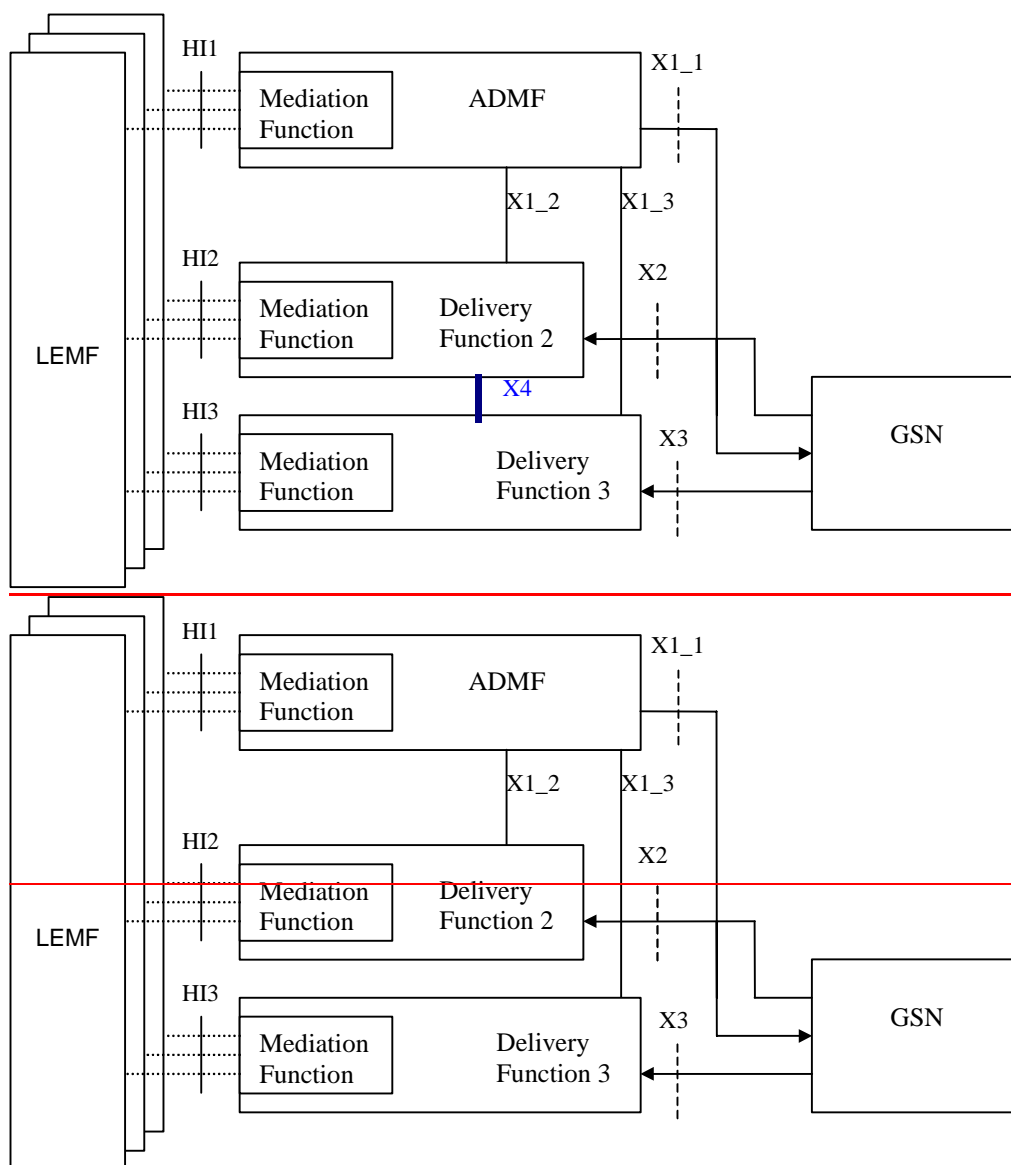**Figure 1a: Circuit switched intercept configuration**

Figure 1b: Packet Switched 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 or J-STD-25 is used, then the adaptation to HI1, HI2 and HI3 will be as defined in those specifications.

DF3 is responsible two primary functions:

- Call Control (Signaling) for the intercepted product; and

- Bearer Transport for the intercepted product.

HI3 is the interface towards the LEMF. It must be able to handle the signalling and the bearer transport for the intercepted product. LEMF can be located within the 3G network or can be in any other network.

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.

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, X3, and ~~X3~~ X4 interfaces.

Interception at the Gateways is a national option.

In case of a secondary interception activation only the relevant LEAs will get the relevant IRIs.
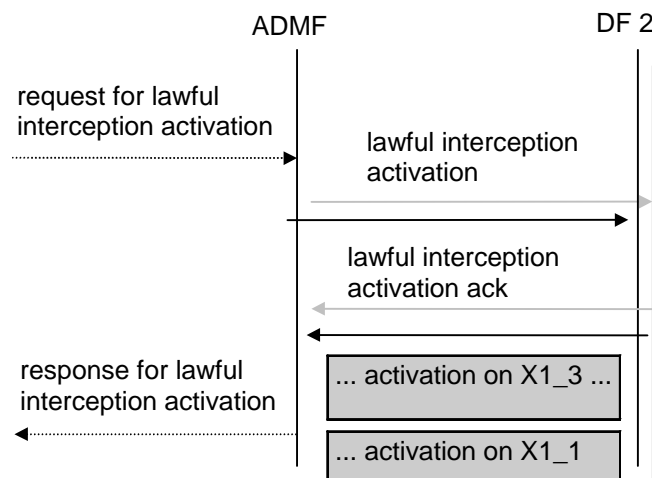
*** SECOND CHANGE ***

5.1.2   X1_2-interface (IRI)

For the activation of IRI the message sent from the ADMF to the DF contains:

- the target identity;

- the address for delivery of IRI (= LEMF address);

- which subset of information shall be delivered;

- a DF2 activation identity, which uniquely identifies the activation for DF2 and is used for further interrogation or deactivation, respectively;

- the IA in case of location dependent interception;

- the address of DF3 (for DF2 to DF3 communications);

- the warrant reference number if required by national option.

If a target is intercepted for several LEAs and/or several identities simultaneously, a single activation of delivery is necessary for each combination of LEA and identity.

Figure 4: Information flow on X1_2-interface for Lawful Interception activation

5.1.3   X1_3-interface (CC)

For the activation of intercepted Content of Communications the message sent from the ADMF to the Delivery
Function contains:

- the target identity;

- the address of delivery for CC (= LEMF address);

- a DF3 activation identity, which uniquely identifies the activation for DF3 and is used for further interrogation
  or deactivation, respectively;

- the IA in case of location dependent interception;

- the address of DF2 (for DF2 to DF3 communications);

- the warrant reference number if required by national option.

If a target is intercepted by several LEAs and/or several identities simultaneously, a single activation of delivery is
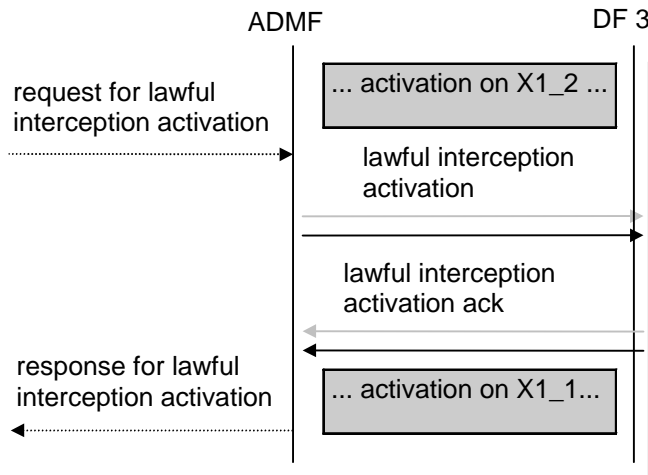necessary for each combination of LEA and identity.

Figure 5: Information flow on X1_3-interface for Lawful Interception activation

7   Invocation of Lawful Interception for GSN Packet Data services

Figure shows the extract from the reference configuration which is relevant for the invocation of the Lawful
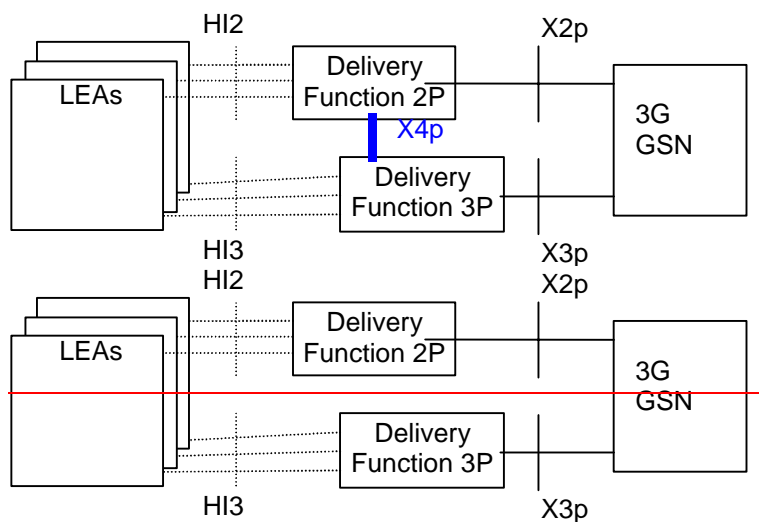Interception of the packet data GSN network.

Figure 18: Functional model for Packet Data GSN Network Lawful Interception invocation

The HI2 and HI3 interfaces represent the interfaces between the LEA and two delivery functions. Both interfaces are subject to national requirements. They are included for completeness, but are beyond the scope of this specification. The delivery functions are used:

- to convert the information on the X2-interface and the appropriate information on the X4-interface to the corresponding information on the HI2 interface;

- to distribute the intercept related information to the relevant LEA(s);

- to distribute the intercept product to the relevant LEA(s).

In case a Packet Data communication is selected based on several identities (MSISDN, IMSI, IMEI,) of the same target, the 3G SGSN and/or, per national option 3G GGSN will deliver CC and IRI only once to the DF2 and DF3. DF2 and DF3 will then distribute the information to the relevant LEAs.

For the delivery of the CC and IRI the 3G SGSN and/or, per national option 3G GGSN provides correlation number and target identity to the DF2 and DF3 which is used there in order to select the different LEAs where the product shall be delivered.

The correlation number is unique in the whole PLMN and is used to correlate CC with IRI and the different IRI's of one PDP context.

The correlation number shall be generated by using existing parameters related to the PDP context.

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

In case of location dependent interception:

- for each target, the location dependency check occurs at each Packet Data session establishment or release and at each Routing Area (RA) update to determine permanently the relevant IAs (and deduce, the possible LEAs within these IAs),

- concerning the IRI:

  - when an IA is left, a Mobile Station Detach event is sent when changing servicing 3 G GSNs or a RA update event is sent when changing IAs inside the same servicing 3G SGSN to DF2;

  - when a new IA is entered a RA update event is sent to DF2 and, optionally, a Start of Interception with Active PDP Context event for each PDP context;

- concerning the CC, when crossing IAs, the CC is not sent anymore to the DF3 of the old IA but sent to the DF3 of the new IA.

Both in case of location dependent and location independent interception:

"Start of interception with active PDP context" event is sent by the new SGSN if an Inter-SGSN RA update procedure ,which involves different PLMNs, takes place for a target, which has at least one active PDP context.

> NOTE: An SGSN can differentiate "Inter PLMN" type of Inter-SGSN RA update procedure from "Intra PLMN" type of Inter-SGSN RA update procedure by inspecting the old RAI parameter, which is being received by the SGSN as part of the procedure (see 3GPP TS 23.060, section 6.9.1.2.2 and 3GPP TS 23.003, section 4.2).

*** FIFTH CHANGE ***

7.5 ~~Void~~DF2 to DF3 Communications Interface

The DF2 and DF3 can communicate with one another over the X4 interface. This interface is used to support specific interception capabilities that need such communications.

The DF2 to DF3 interface could be established on a permanent (provisioned) basis or on a semi-permanent basis (established dynamically, but kept established indefinitely).

The DF2 to DF3 association should be a secure one meaning that each side should be able to authenticate the other and if communications occur over a shared intervening network encryption of the communications should be considered..

This interface can be used to exchnage information between the DF2 and the DF3 to enable specific IRI or content delivery.

When any information is sent between DF2 and DF3, the following information should be included:

- Identity of the receiving DF;
- Identity of the sending DF;
- Security/Authentication information;
- Timestamp;
- Sequence number (unless the transport guarreentees in sequence delivery of user data) - Optional;
- Transaction identifer (used to correlate a potential response with information sent) - Optional;
- Error parameter (used to indicate an error [e.g., unsupported message] in received information);
- DF2 to DF3 Event identitifier (e.g., to identify the reason for sending the communication);
- DF2 to DF3 Data.

The nature of the DF2 to/from DF3 data is specific to the capability utilizing this communications link and will need to be specified by that capability.

Page: 2
[H1] Document numbers are allocated by the Working Group Secretary.

Page: 2
[H2] Enter the specification number in this box. For example, 04.08 or 31.102. Do not prefix the number with anything . i.e. do not use "TS", "GSM" or "3GPP" etc.

Page: 2
[H3] Enter the CR number here. This number is allocated by the 3GPP support team. It consists of at least three digits, padded with leading zeros if necessary.

Page: 2
[H4] Enter the revision number of the CR here. If it is the first version, use a "-".

Page: 2
[H5] Enter the version of the specification here. This number is the version of the specification to which the CR will be applied if it is approved. Make sure that the latest version of the specification (of the relevant release) is used when creating the CR. If unsure what the latest version is, go to http://www.3gpp.org/specs/specs.htm.

Page: 2
[H6] For help on how to fill out a field, place the mouse pointer over the special symbol closest to the field in question.

Page: 2
[H7] Mark one or more of the boxes with an X.

Page: 2
[H8] SIM / USIM / ISIM applications.

Page: 2
[H9] Enter a concise description of the subject matter of the CR. It should be no longer than one line. Do not use redundant information such as "Change Request number xxx to 3GPP TS xx.xxx".

Page: 2
[H10] Enter the source of the CR. This is either (a) one or several companies or, (b) if a (sub)working group has already reviewed and agreed the CR, then list the group as the source.

Page: 2
[H11] Enter the acronym for the work item which is applicable to the change. This field is mandatory for category F, B & C CRs for release 4 and later. A list of work item acronyms can be found in the 3GPP work plan. See http://www.3gpp.org/ftp/information/work_plan/ .
The list is also included in a MS Excel file included in the zip file containing the CR cover sheet template.

Page: 2
[H12] Enter the date on which the CR was last revised. Format to be interpretable by English version of MS Windows ® applications, e.g. 19/02/2002.

Page: 2
[H13] Enter a single letter corresponding to the most appropriate category listed below. For more detailed help on interpreting these categories, see the Technical Report 21.900 "TSG working methods".

Page: 2
[H14] Enter a single release code from the list below.

Page: 2
[H15] Enter text which explains why the change is necessary.

Page: 2

[H16] Enter text which describes the most important components of the change. i.e. How the change is made.

Page: 2

[H17] Enter here the consequences if this CR was to be rejected. It is necessary to complete this section only if the CR is of category "F" (i.e. correction).

Page: 2

[H18] Enter the number of each clause which contains changes.

Page: 2

[H19] Tick "yes" box if any other specifications are affected by this change. Else tick "no". You MUST fill in one or the other.

Page: 2

[H20] List here the specifications which are affected or the CRs which are linked.

Page: 2

[H21] Enter any other information which may be needed by the group being requested to approve the CR. This could include special conditions for it's approval which are not listed anywhere else above.

Page: 2

[H22] This is an example of pop-up text.