Technical Specification Group Services and System Aspects Meeting #12, Stockholm, Sweden, 18-21 June 2001

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Source: **SA WG3**

Title: **CR to 33.107 Update of 33.107 to include Release 5 requirements**

Document for: **Approval**

Agenda Item: **7.3.3**

Spec	CR	Rev	Phase	Cat	Subject	Version-Current	Version-New	Doc-2nd-Level
33.107	004	1	Rel-5	B	Update of 33.107 to include Release 5 requirements	4.0.0	5.0.0	S3LI-01-047_revised

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CR-Form-v3

CHANGE REQUEST

⌘ **33.107** **CR** **004** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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 ☒

Title:	⌘	Update of TS 33.107 for Release 5
Source:	⌘	SA WG3 LI
Work item code:	⌘	SEC1-LI
Date:	⌘	24.01.2001
Category:	⌘	**B**
Release:	⌘	REL-5

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	Inclusion of Release 5 interception requirements
Summary of change:	⌘	Updates to 33.107 to produce Rel-5 specification.
Consequences if not approved:	⌘	Release 5 requirements are not included (No Rel-5 TS created).

Clauses affected:	⌘	Various		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	33.106 CR003
Other comments:	⌘	CRs to previous Releases to be implemented before this CR		

1 Scope

The present document describes the architecture and functional requirements within a Third Generation Mobile Communication System (3GPP MS).

The specification shows the service requirements from a Law Enforcement point of view only. The aim of this document is to define a 3GPP MS interception system that supports a number of regional interception regulations, but these regulations are not repeated here as they vary. Regional interception requirements shall be met in using specific (regional) mediation functions allowing only required information to be transported.

*** Next modification ***

3.2 Abbreviations

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

~~3GMS~~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
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
ICEs	Intercepting Control Elements (3G MSC Server, 3G GMSC Server, P CSCF, S CSCF, SGSN, GGSN)
IP	Internet Protocol
IRI	Intercept Related Information
LDI	Location Dependent Interception
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
INEs	Intercepting Network Elements (3G MSC Server, 3G GMSC Server, P CSCF, S CSCF, SGSN, GGSN, MGW)
RA	Routing Area

*** Next modification ***

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.

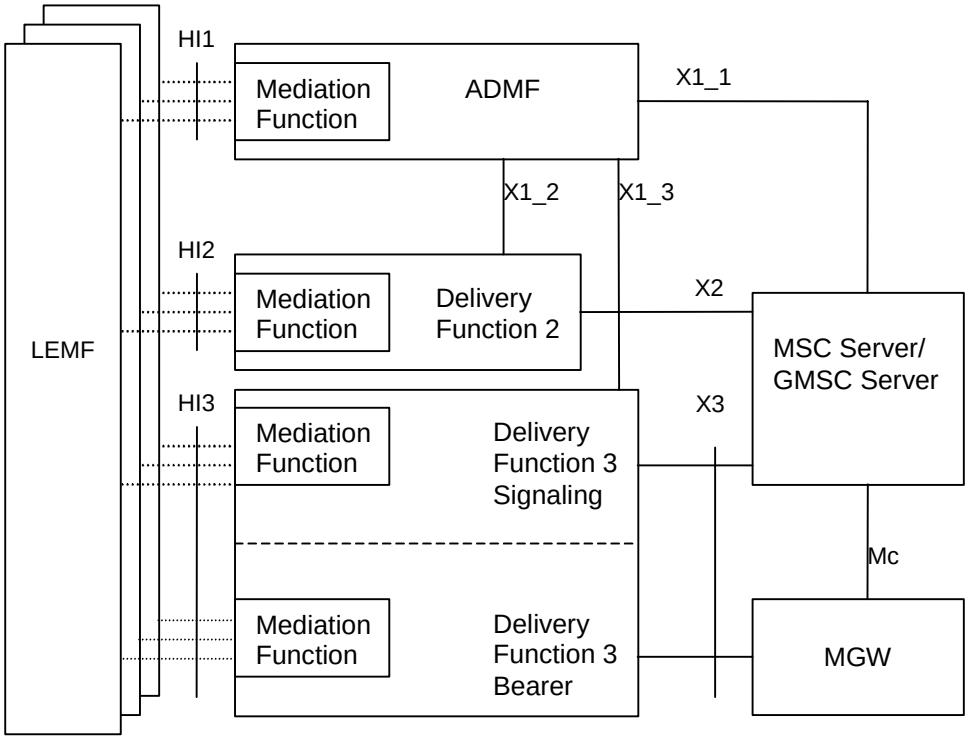

Figure 1.a Circuit switched intercept configuration

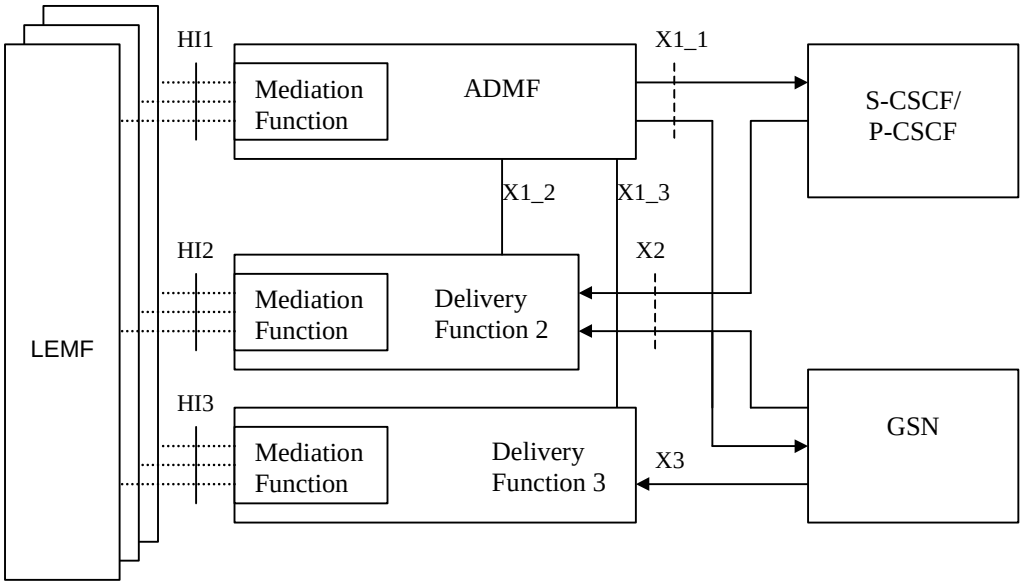

Figure 1b Packet Switched Intercept configuration

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 for 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 INEs~~ 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 and X3 interfaces.

Interception at the Gateways is a national option.

*** Next modification ***

5 Activation, deactivation and interrogation

Figure 2 is an extraction from the reference intercept configuration shown in figure 1which is relevant for activation, deactivation and interrogation of the lawful interception.

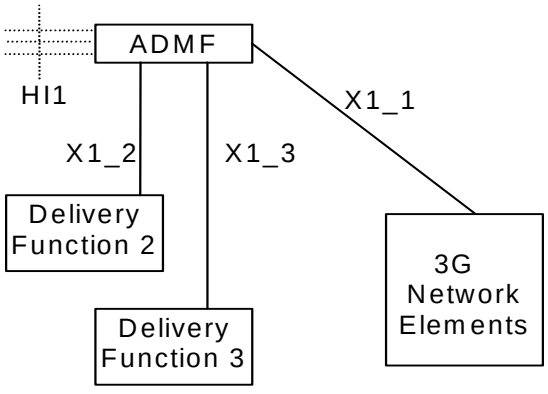

Figure 2: Functional model for Lawful Interception activation, deactivation and interrogation

In addition to the typical ~~3G INEs~~ 3G ICEs functional entities, a new functional entity is introduced - the ADMF - the Lawful Interception administration function. The ADMF:

- interfaces with all the LEAs that may require interception in the intercepting network;
- keeps the intercept activities of individual LEAs separate;
- interfaces to the intercepting network.

Every physical 3G ICE, is linked by its own X1_1-interface to the ADMF. Consequently, every single 3G ICE performsinterception (activation, deactivation, interrogation as well as invocation) independently from other ICEs. The HI1-interface represents the interface between the requester of the lawful interception and the Lawful administration function; it is included for completeness, but is beyond the scope of standardisation in this document.

The target identities for 3GPP MS CS and GPRS interception at the SGSN, GGSN, 3G MSC Server and 3G GMSC Server can be at least one of the following: IMSI, MSISDN or IMEI.

The target identity for multi-media is the SIP URL at the CSCF. Other identities are for further study.

In case of location dependent interception the following network/national options exist:

- target location versus Interception Areas (IAs) check in the ~~3G INEs~~ 3G ICEs and Delivery Functions (DFs);
- target location versus IAs check in the DFs (physical collocation of the DFs to the ~~3G INEs~~3G ICEs may be required by national law).

NOTE 1: The IA is previously defined by a set of cells. From the location of the target this set of cells permits to find the relevant IA.

NOTE 2: It is not required that the 3G GMSC or the 3G GGSN are used for interception when Location Dependent Interception is invoked and the location of the target is not available.

Location dependent intercept at the CSCF is for further study.

Location dependent intercept for the 3G MSC Server and SSGN is for further study

The ADMF shall be able to provision P-CSCFs independently from S-CSCFs on a network wide basis. All P-CSCFs, all S-CSCFs or both shall be administered for intercept as a network configuration. If both P-CSCFs and S-CSCFs are administered within the network for intercept, redundant multi-media IRI may be presented to the agency as a result.

5.1 Activation

Figures 3,4 and 5 show the information flow for the activation of Lawful Interception.

5.1.1 X1_1-interface

The messages sent from the ADMF to the 3G ICEs (X1_1-interface) contain the:

- target identities (MSISDN, IMSI, IMEI or SIP URL) (see note 4);
- information whether the Content of Communication (CC) shall be provided (see note 1);
- address of Delivery Function 2 (DF2) for the intercept related information (see note 2);
- address of Delivery Function 3 (DF3) for the intercepted content of communications (see note 3);
- IA in case of location dependent interception.

NOTE 1: As an option, the filtering whether intercept product and/or intercept related information has to be provided can be part of the delivery functions. (Note: intercept product options do not apply at the CSCF). If the option is used, the corresponding information can be omitted on the X1_1-interface, while "information not present" means "intercept product and related information has to be provided" for the ICE~~SN~~. Furthermore the delivery function which is not requested has to be "pseudo-activated", in order to prevent error cases at invocation.

NOTE 2: As an option, only a single DF2 is used by and known to every 3G ICE. In this case the address of DF2 can be omitted.

NOTE 3: As an option, only a single DF3 is used by and known to every 3G ICE (except at the CSCFs). In this case the address of DF3 can be omitted.

NOTE 4: Since the IMEI is not available, interception of IMEI is not applicable at the 3G Gateway.

NOTE 5: Interception at the CSCFs is based only upon SIP URL. However, SIP URL as a target identity is not supported the other ICEs.

If after activation subsequently Content of Communications (CC) or Intercept Related Information (IRI) has to be activated (or deactivated) an "activation change request" with the same identity of the target is to be sent.

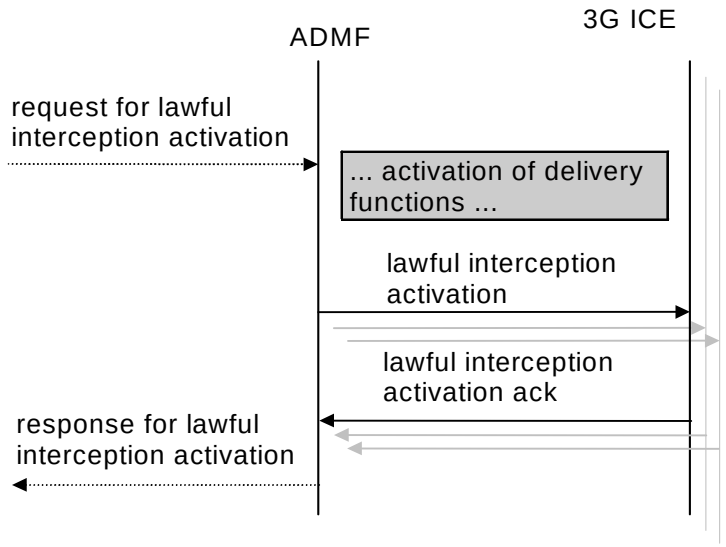

Figure 3: Information flow on X1_1-interface for Lawful Interception activation

Interception of a target can be activated on request from different LEAs and each LEA may request interception via a different identity. In this case, each target identity on which to intercept will need to be sent via separate activation messages from ADMF to the 3G ICEs on the X1_1-interface. Each activation can be for IRI only, or both CC and IRI.

When several LEAs request activation on the same identity then the ADMF determines that there are existing activations on the identity. In this case, the ADMF will not send an additional activation message to the 3G ICEs except when the activation needs to change from IRI only to CC and IRI. In that case an activation change message will be sent to the 3G ICEs.

*** Next modification ***

5.2 Deactivation

Figures 6,7 and 8 show the information flow for the deactivation of the Lawful interception.

5.2.1 X1_1-interface

The messages sent from the ADMF to the 3G ICEs for deactivation contain:

- the target identity;
- the possible relevant IAs in case of location dependent interception.

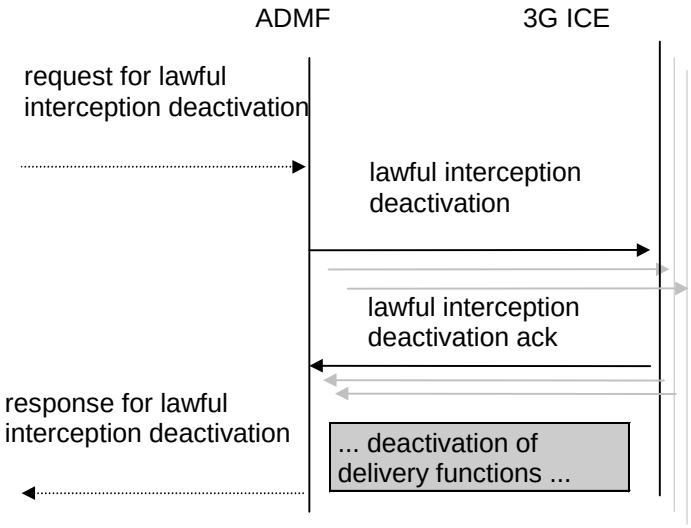

Figure 6: Information flow on X1_1-interface for Lawful Interception deactivation

If interception of a target has been activated via different identities then a separate deactivation message will need to be sent from the ADMF to the 3G ICEs for each identity.

When several LEAs requested activation on the same identity and subsequently request deactivation then the ADMF determines that there are remaining activations on the identity. In this case, the ADMF will not send a deactivation message to the 3G ICEs except when the activation needs to change from CC and IRI to ~~CC~~ IRI only. In that case an activation change message will be sent to the 3G ICEs.

*** Next modification ***

6.3.2 Structure of the events

The information sent to DF2 is triggered by up to eight different call related and non-call related events. Details are described in following subclause. The events for interception are configurable (if they are sent to DF2) in the 3G MSC Server and can be suppressed in the DF2. The events are listed as follows:

Call Related Events:

- Call Establishment
- Answer
- Supplementary Service
- Handover
- Release

Non Call Related Events:

- SMS
- Location Update
- Subscriber Controlled Input

Table 1 below shows the set of information that is used to generate the events. The events transmit the information from the 3G MSC Server to DF2. This set of information can be extended in the 3G MSC Server, if this is necessary in a specific country. DF2 can extend this information if this is necessary in a specific country e.g. a unique number for each surveillance warrant.

Table 1: Information Elements for Circuit Event records

Observed MSISDN Target Identifier with the MSISDN of the target subscriber (monitored subscriber).
Observed IMSI Target Identifier with the IMSI of the target subscriber (monitored subscriber).
Observed IMEI Target Identifier with the IMEI of the target subscriber (monitored subscriber), It shall be checked for each call over the radio interface
event type Description which type of event is delivered: Establishment, Answer, Supplementary service, Handover, Release, SMS, Location update, Subscriber controlled input
event date Date of the event generation in the 3G MSC Server
event time Time of the event generation in the 3G MSC Server
dialled number Dialled phone number before digit modification, IN-modification etc.
Connected number Number of the answering party
other party address Directory number of the other party for MOC Calling party for MTC
call direction Information if the monitored subscriber is calling or called e.g. MOC/MTC or originating/ terminating In or/out
Correlation number Unique number for each call sent to the DF, to help the LEA, to have a correlation between each Call and the IRI
Network Element Identifier Unique identifier for the element reporting ~~intercept~~ the ICE.
Location Information Location information is the service area identity and/or location area identity that is present at the 3G MSC Server at the time of event record production.
basic service Information about Tele service or bearer service.
Supplementary service Supplementary services used by the target e.g. CF, CW, ECT
Forwarded to number Forwarded to number at CF
call release reason Call release reason of the target call
SMS Message The SMS content with header which is sent with the SMS-service
Redirecting number The number which invokes the call forwarding towards the target. This is provided if available.
SCI Non call related Subscriber Controlled Input (SCI) which the 3G MSC Server receives from the ME

*** Next modification ***

6.3.4 Non Call Related events

6.3.4.1 SMS

For MO-SMS the event is generated in the 3G MSC Server, when the SMSC successfully receives the SMS; for MT-SMS the event is generated in the 3G MSC Server when the target receives the message. This information will be delivered to the DF2 if available:

Observed MSISDN
Observed IMSI
event type
event date
event time
Network Element Identifier
Location information
SMS Message

6.3.4.2 Location update

For location updates a Location update-event is generated, with the new location ~~(location area)~~ information. This information will be delivered to the DF2 if available:

Observed MSISDN
observed IMSI
event type
event date
event time
Network Element Identifier
location information

6.3.4.3 Subscriber Controlled Input (SCI)

SCI includes subscriber initiated changes in service activation and deactivation. SCI does not include any information available in the CC. For subscriber controlled inputs - a SCI-event is generated with information about the SCI. This information will be delivered to the DF2 if available:

observed MSISDN
observed IMSI
event type
event date
event time
Network Element Identifier
location information
SCI

*** Next modification ***

6.4 Intercept cases for circuit switched supplementary services

6.4.1 Interception of Multiparty call

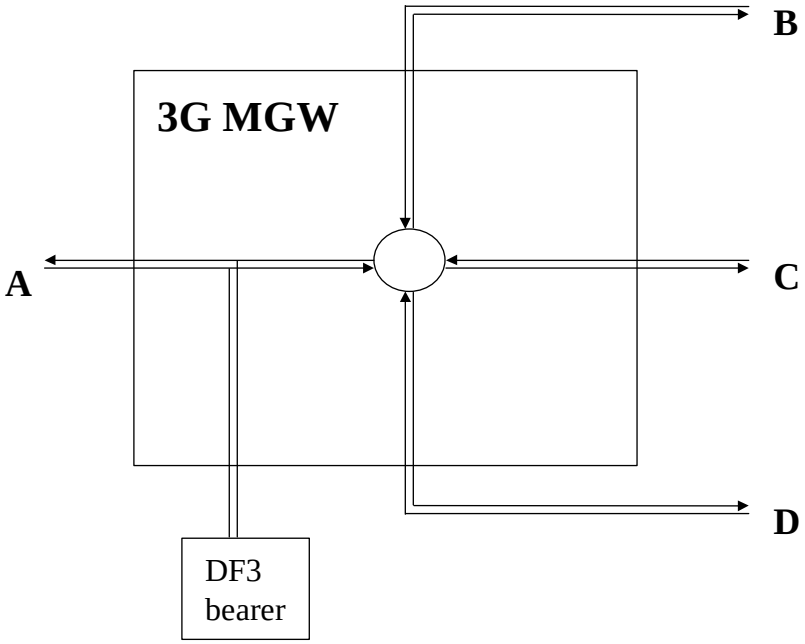

Figure 16: Interception of Multiparty for CC

~~Note: This figure will be updated based upon the definition of CS multi-party service architecture, once it is available.~~

Figure 16 shows the delivery of CC from intercepted multiparty call where party A is the target of interception.

One pair of call content channels are delivered to the delivery function. Party A is delivered to the DF3 on one channel and the sum of the balance of the parties, B,C and D is delivered on the second channel.

It should be noted that if parties B,C or D is a target of interception, that intercept is treated as a simple call intercept.

The events contain information about B, C and D if subscriber A is monitored. If one of B, C or D is monitored, events contain the information about A but not the other parties of the conference.

*** Next modification ***

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.

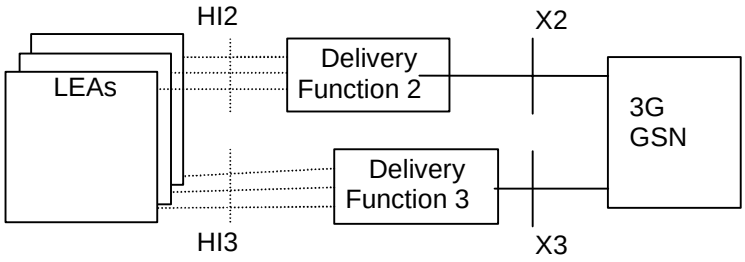

Figure 18: Functional model for Packet Data GSN Network Lawful Interception invocation

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 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 G-SNs 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.

*** Next modification ***

7.3 Provision of Intercept Related Information

Intercept Related Information (Events) are necessary at the Mobile Station Attach, Mobile Station Detach, PDP Context Activation, Start of intercept with PDP context active, PDP Context Deactivation, RA update, and SMS events.

Figure 21 shows the transfer of intercept related information to the DF2. If an event for / from a mobile subscriber occurs, the 3G GSN sends the relevant data to the DF2.

See section 7A for multi-media Intercept Related Information produced at the CSCF.

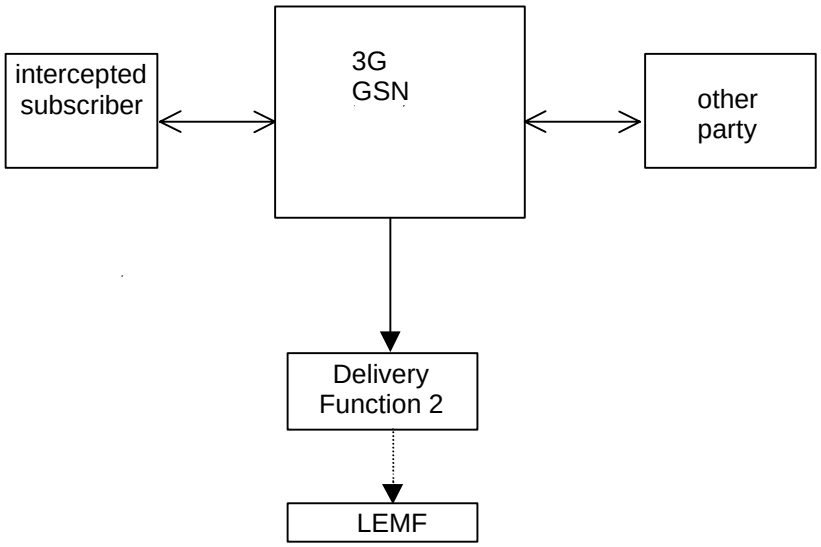

Figure 21: Provision of Intercept Related Information

7.3.1 X2-interface

The following information needs to be transferred from the 3G GSN to the DF2 in order to allow a DF2 to perform its functionality:

- target identity (MSISDN, IMSI, IMEI);
- events and associated parameters as defined in section 7.3.2 and 7.4 may be provided;
- the target location (if available) or the IAs in case of location dependent interception.
- Correlation number

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

7.3.2 Structure of the events

There are seven different events in which the information is sent to the DF2 if this is required. Details are described in the following section. The events for interception are configurable (if they are sent to DF2) in the 3G GSN and can be suppressed in the DF2.

The following events are applicable to 3G SGSN:

- Mobile Station Attach;
- Mobile Station Detach;
- PDP context activation;
- Start of intercept with PDP context active;

- PDP context deactivation;
- RA update;
- SMS.

NOTE: 3G GGSN interception is a national option. Location information may not be available in this case.

The following events are applicable to the 3G GGSN:

- PDP context activation ;
- PDP context deactivation ;
- Start of interception with PDP context active.

A set of fields as shown below is used to generate the events. The events transmit the information from 3G GSN to DF2. This set of fields as shown below can be extended in the 3G GSN, if this is necessary as a national option. DF2 can extend this information if this is necessary as a national option e.g. a unique number for each surveillance warrant.

Table 2: Information Events for Packet Data Event Records

Observed MSISDN MSISDN of the target subscriber (monitored subscriber)
Observed IMSI IMSI of the target subscriber (monitored subscriber)
Observed IMEI IMEI of the target subscriber (monitored subscriber),it shall be checked for each activation over the radio interface.
Event type Description which type of event is delivered: ~~PDP~~ MS attach, ~~PDP~~ MS detach, PDP context activation, Start of intercept with PDP context active, PDP context deactivation, SMS, Cell and/or RA update,
Event date Date of the event generation in the 3G GSN
Event time Time of the event generation in the 3G GSN
PDP address The PDP address of the target subscriber. Note that this address might be dynamic.
Access Point Name The APN of the access point. (Typically the GGSN of the other party)
Location Information Location information is the service area identity, RAI and/or location area identity that is present at the GSN at the time of event record production.
PDP Type The used PDP type.
Correlation Number The correlation number is used to correlate CC and IRI.
SMS The SMS content with header which is sent with the SMS-service. The header also includes the SMS-Centre address.
Network Element IdentifierUnique identifier for the element reporting the ICE.
Failed attach reason Reason for failed attach of the target subscriber.
Failed context activation reason Reason for failed context activation of the target subscriber.
IAs The observed Interception Areas

*** Next modification ***

~~7.5 Intercept cases for supplementary services~~

~~Supplementary services may be used with Packet Data. However they are not standardised and therefore Lawful Interception interwork cases can not be defined at the time of publication of this document.~~

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 section 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 URL target identifiers. These resulting intercepted SIP messages shall be sent to DF2 for mediation prior to transmittal across the HI2 interface.

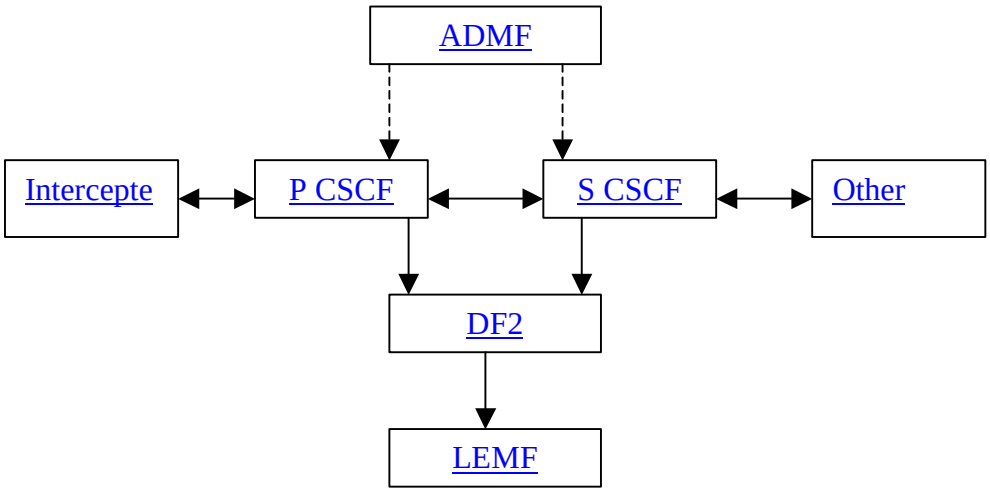

Figure 22: Provision of Intercept Related Information for multi-media

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 reporting of location information for the sake of location dependent intercept is for further study.
- The use of a correlation ID for SIP to bearer correlation is a topic for further study.

-- An intercepted SIP event sent to DF2 is shown below:

- Observed SIP URL
- Event Time and Date

- Network element identifier
- SIP Message Header
- SIP Message Payload

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

The following section shows the delivery of intercepted events and product under various call scenarios. The scenarios show where IRI and CC are intercepted, and whether the bearer is presented to DF3 as packet or circuit bearer.

The following scenarios are for further study.

1. PS mobile to PS mobile CF to PS mobile
2. CS mobile to PS mobile CF to PSTN
3. PSTN to PS mobile CF PSTN
4. PDN to PS mobile CF to PDN
5. CS mobile to CS mobile CF to CS mobile
6. PS mobile to CS mobile CF to PS mobile
7. PSTN to CS mobile CF to PSTN
8. Multi-party calls with CS anchor
9. Multi-party calls with PS anchor

*** Next modification ***

8 Security

The security requirements are valid for the whole Lawful Interception system, i.e. rules and procedures shall be used for all involved entities, 3G GSN and the DF.

8.1 Administration security

The administration of the LI function, i.e. Activation, Deactivation and Interrogation of Lawful Interception, in the 3G ICEs and the DFs shall be done securely as described below:

- It shall be possible to configure the authorised user access within the serving network to Activate, Deactivate and Interrogate Lawful Interception separately for every physical or logical port at the 3G ICEs and DF. It shall be possible to password protect user access.
- Only the ADMF is allowed to have access to the LI functionality in the 3G ICEs and DF.
- The communication links between ADMF, 3G GSN,3G MSC Server, CSCF, DF2, ~~DF2P~~, and DF3 may be required by national option to support security mechanisms. Options for security mechanisms include:
- CUG / VPN;
- COLP;
- CLIP

- authentication;
- encryption.

Through the use of user access restrictions, no unauthorised network entities or remote equipment shall be able to view or manipulate LI data in the 3G GSN, 3G MSC Server, CSCF or the DFs.

*** Next modification ***

8.5 Other security issues

8.5.1 Log files

Log files shall be generated by the ADMF, DF2,, DF3, , 3G MSC Server, CSCF and the 3G GSN. All log files are retrievable by the ADMF, and are maintained by the ADMF in a secure manner.

8.5.2 Data consistency

The administration function in the 3GPP MS shall be capable to perform a periodic consistency check to ensure that the target list of target identities in all involved 3G MSC Servers, CSCFs, 3G GSNs in the 3GPP MS and the DFs contain the appropriate target Ids consistent with the intercept orders in the ADMF. The reference data base is the ADMF data base.

*** Next modification ***

B.5 Inter 3G GSN Routing Area Update

Figure B5 shows the interception of an Inter Routing Area Update where the mobile (A) is the target for interception. The sequence is the same for the combined RA / LA Update procedure but additional signalling is performed between the 3G GSN, HLR and the old 3G GSN before the Routing Area Update Accept message is sent to the MS. In case of PDP context not being active less signalling is required.

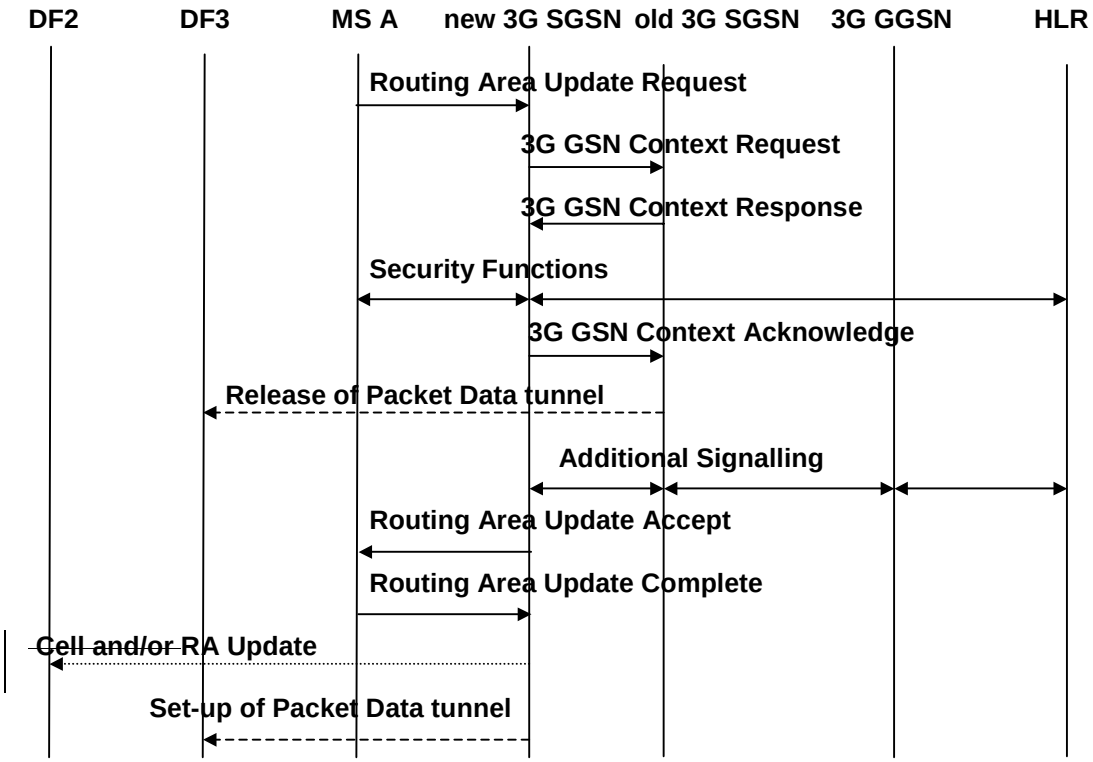

Figure B.5: Interception of an Inter Routing Area Update

Annex C (informative)

The following figures show the information flows for the invocation of Lawful Interception for Packet Data with multimedia. The figures show some of the basic signalling messages of the target Packet Data communication and the events on the X2 interfaces. The dotted lines indicate signalling depending on whether IRI information has been requested. The figures illustrate interception in the visited network.

C.1 Multimedia Registration

Figures C1.1 and C1.2 show the intercept of the Multimedia registration for the case of visited network interception. (Refer to 3G TS 23.228 section 5.3.2.4 and 5.3.2.5)

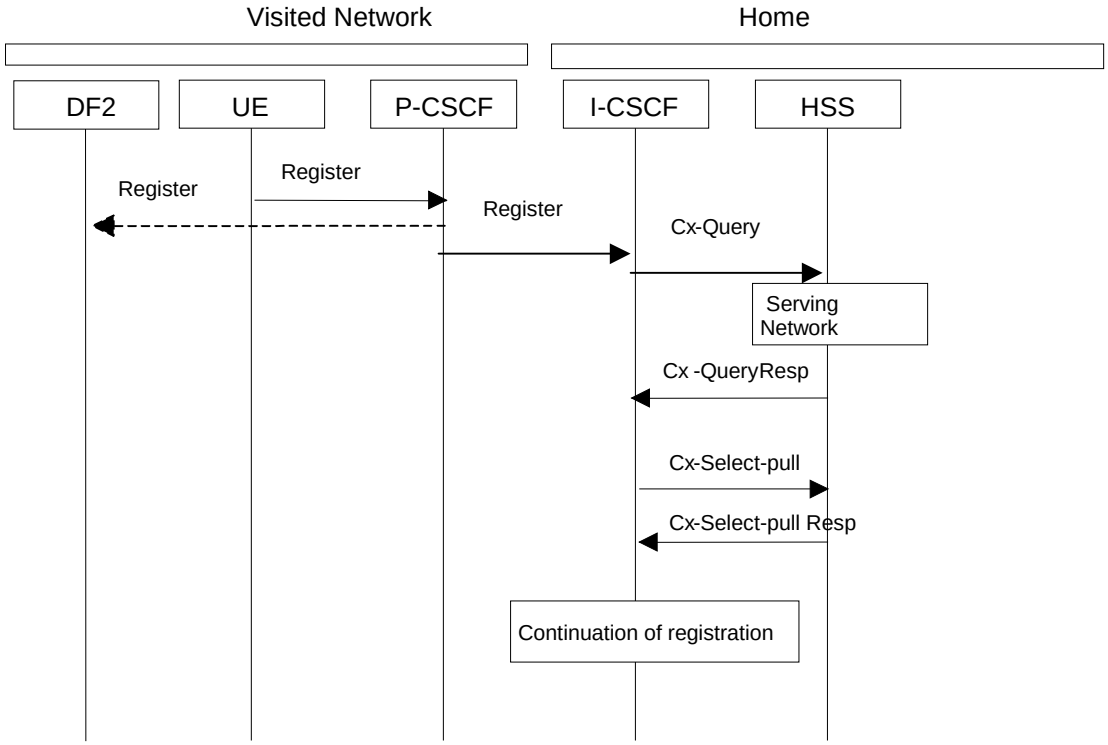

Figure C1.1: Intercept of Start of Multimedia Registration

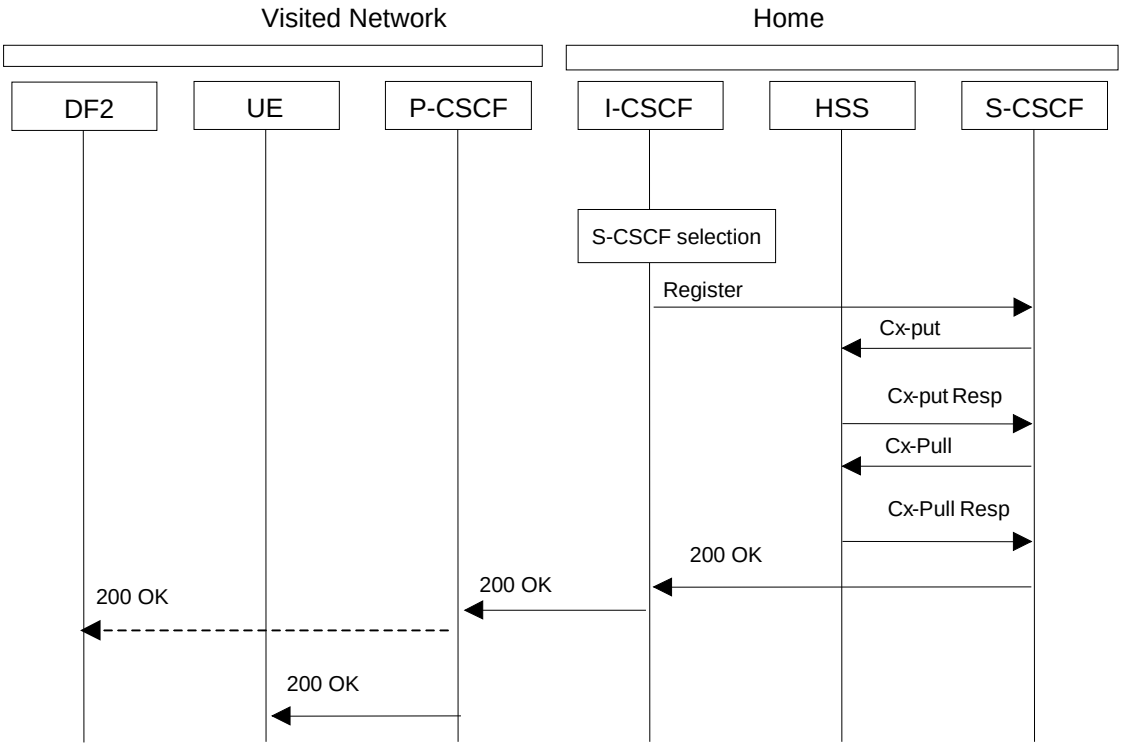

Figure C1.2: Intercept of Continuation of Multimedia Registration

Note: The same SIP Registration command is used for the initial registration and any registration updates. Registration deletion request is accomplished with a Registration command that indicates a '*' contact or zero expiration time.

C.2 Multimedia Session Establishment and Answer

Figure C2 shows the intercept of the Multimedia Establishment and Answer in the visited network (Refer to 3G TS 23.228 section 5.7.1)

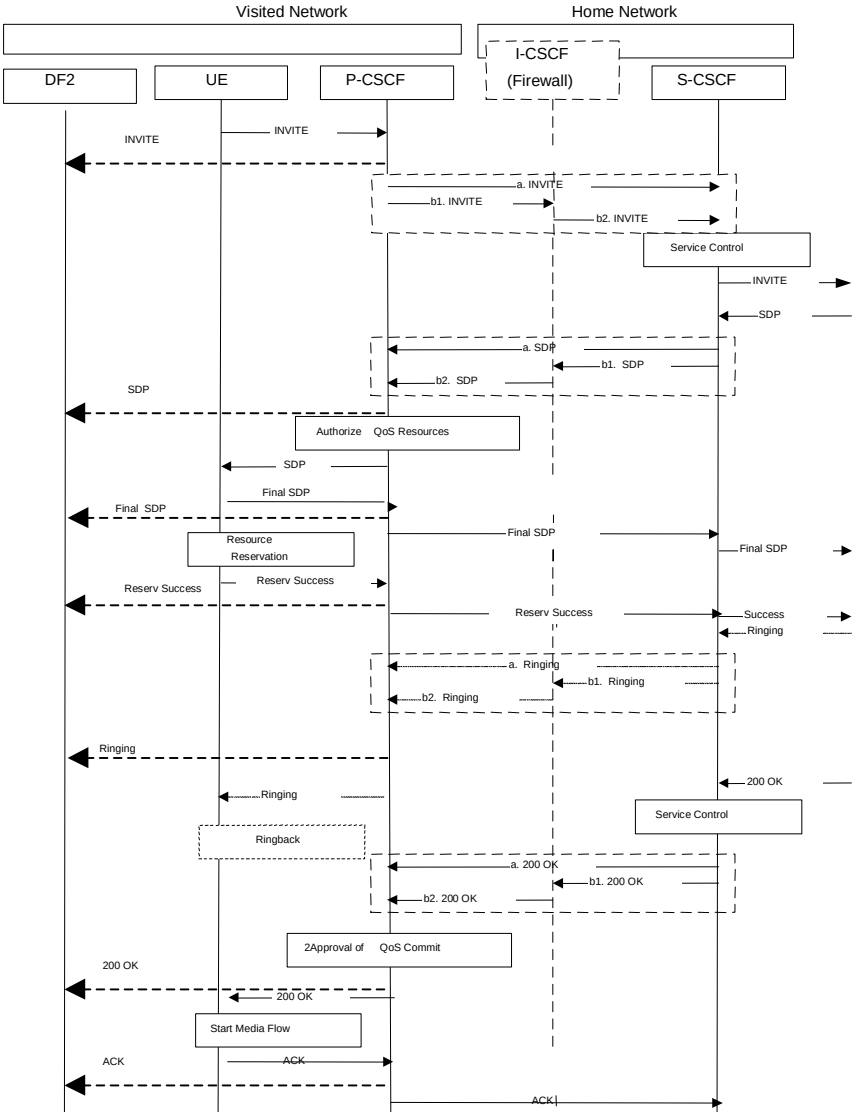

Figure C2 Intercept of Multimedia Establishment and Answer at Visiting Network

C.3 Multimedia Release

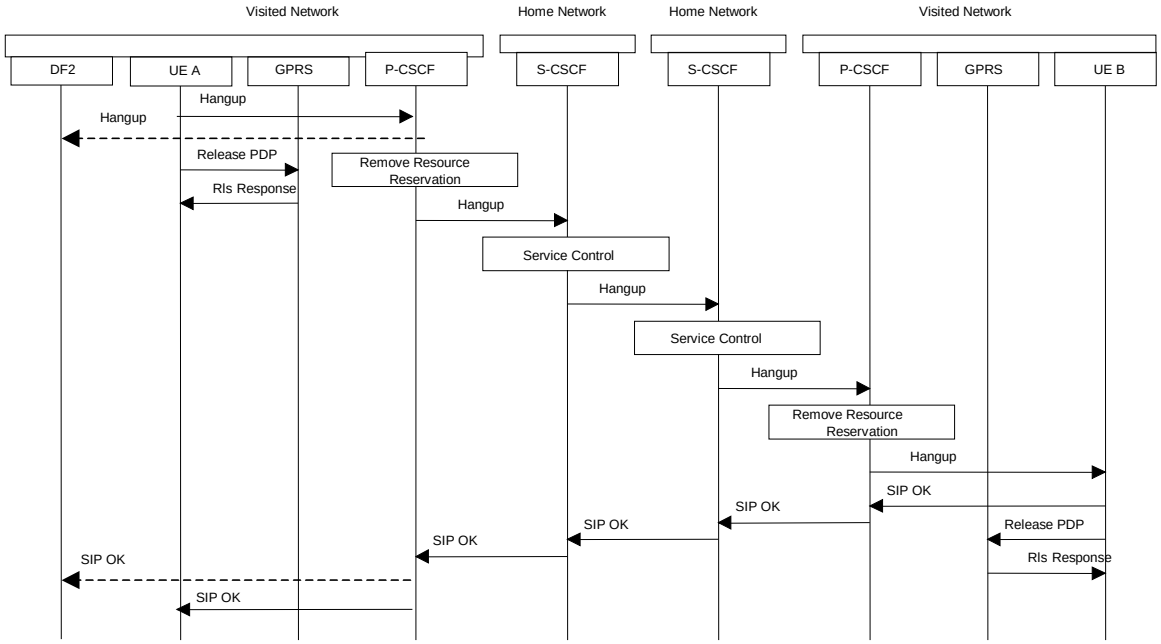

Figure C3 shows the intercept of the Multimedia Release in the visited network (3G TS 23.228 para C.2.1 reference available)

Figure C3 Intercept of Multimedia Release at Visiting Network

C.4 Multimedia with Supplementary Service – Call Forwarding

For further study.

C.5 Multimedia with Supplementary Service – Explicit Call Transfer

For further study.

C.6 Multimedia with Supplementary Service – Subscriber Controlled input

For further study.

*** END OF CHANGES ***