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Technical Specification

Digital cellular telecommunications system (Phase 2+);
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Lawful Interception;
Stage 2
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GLOBAL SYSTEM FOR
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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1 Scope

The present document gives the stage 2 description of Lawful Interception within a PLMN for circuit switched systems and GPRS. It does not address the interface between the PLMN and the LEA lawful intercepted product and related information collection functions. This is outside the scope of the GSM standard.

The structure of the present document is as follows:

- clause 4 covers the architecture of the interception system;
- clause 5 describes how interception is activated, deactivated and interrogated within the interception system;
- clause 6 describes how the system is provisioned, defines events at which interception takes place and what kind of information is generated at each event;
- clause 7 provides brief descriptions of various intercept cases;
- clause 8 reviews security requirements for access to the interception system;
- annex A provides information flows to illustrate when intercepted traffic and related data is generated;
- annex B describes an interception system for GPRS. The annex is subdivided into 5 sections that are identical in structure to clauses 4 through 8, but applicable to a GPRS clause rather than a GSM circuit switched system.

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.
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- 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] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] 3GPP TS 41.033: "Digital cellular telecommunications system (Phase 2+); Lawful Interception requirements for GSM".

[3] 3GPP TS 42.033: "Digital cellular telecommunications system (Phase 2+); Lawful Interception stage 1".

[4] GSM 03.60: "Digital cellular telecommunications system (Phase 2+); GPRS Service description stage 2".

3 Definitions and abbreviations

3.1 Definitions

Definitions can be found in 3GPP TS 42.033 in the stage 1 description of Lawful interception and in GSM 03.60, the stage 2 service description for GPRS.

3.2 Abbreviations

In addition to those below abbreviations used in the present document are listed in GSM 01.04.

ADMF	Administration Function
DF2	Delivery Function 2
DF2P	Delivery Function 2 for GPRS
DF3	Delivery Function 3
DF3P	Delivery Function 3 for GPRS
GCI	Global Cell Identity
GSN	GPRS Support Node (i.e.SGSN or GGSN)
IA	Interception Area
IP	Intercept Product
IRI	Intercept Related Information
LEA	Law Enforcement Agency
SCI	Subscriber Controlled Input

4 Functional architecture

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.

There is one Administration Function (ADMF) in the network. Together with the delivery functions it is used to hide from the MSC/VLR and GMSC that there might be multiple activations by different Law Enforcement Agencies (LEAs) on the same target.

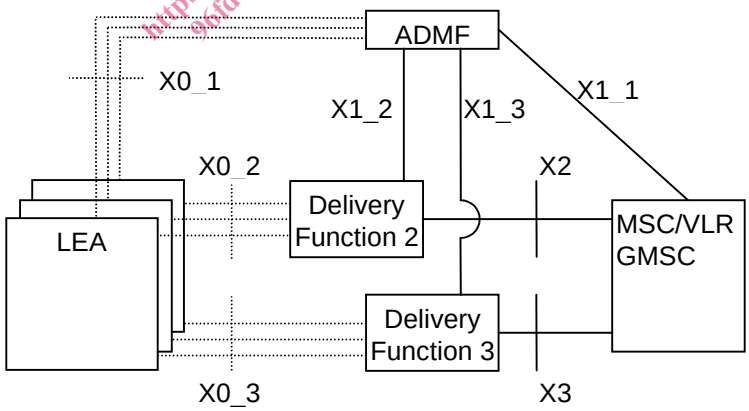

Figure 1: Reference configuration

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.

5 Activation, deactivation and interrogation

The following picture shows the extract from the reference configuration which is relevant for activation, deactivation and interrogation of the lawful interception.

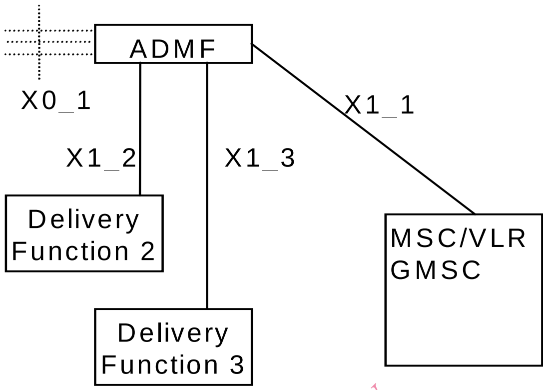

Figure 2: Functional model for Lawful Interception activation, deactivation and interrogation

In addition to the typical GSM 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 PLMN;
- keeps the intercept activities of individual LEAs separate;
- interfaces to the PLMN.

NOTE: The X1_1, X1_2 and X1_3-interfaces together are functionally equivalent to the X1-interface represented in 3GPP TS 41.033.

Every physical MSC/VLR and GMSC is linked by an own X1_1-interface to the ADMF. Consequently, every single MSC/VLR and GMSC performs interception (activation, deactivation, interrogation as well as invocation) independently from other MSC/VLRs and GMSCs. The X0_1-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 standardization.

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

- target location versus Interception Areas (IAs) check in the MSC/VLR and Delivery Functions (DFs);
- target location versus IAs check in the DFs (physical collocation of the DFs to the MSC/VLR, GMSC is required).

NOTE: 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.

5.1 Activation

The following pictures show the information flow for the activation of the Lawful interception.

5.1.1 X1_1-interface

The message sent from the ADMF to the MSC/VLR and GMSC respectively (X1_1-interface) contains the:

- identity of the target (MSISDN, IMSI or IMEI) (see note 4);
- information whether the intercept product shall be provided (see note 1);
- information whether the intercept related information 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 circuit switched intercept product (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. 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 MSC. 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 MSC in the network. 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 MSC in the network. In this case the address of DF3 can be omitted.

NOTE 4: Interception of IMEI is not applicable at the GMSC.

If after activation subsequently Intercept Product (IP) 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.

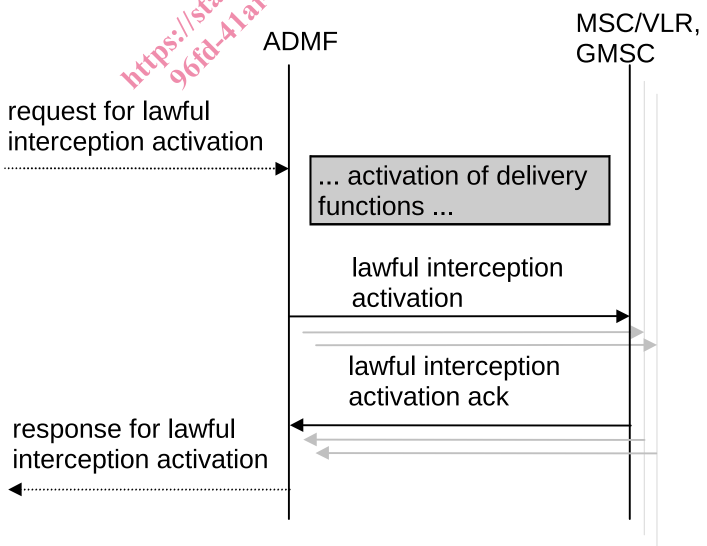

Figure 3: Information flow on X1_1-interface for Lawful Interception activation

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 identity of the target on which to intercept will need to be sent via separate activation message from ADMF to MSC/VLR and GMSC on the X1_1-interface. Each activation can be for IP only, IRI only, or both IP 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 MSC/VLR and GMSC except when the activation needs to change from IP only or IRI only to IP and IRI. In that case an activation change message will be sent to the MSC/VLR and GMSC.

5.1.2 X1_2-interface (IRI)

For the delivery of IRI the message sent from the ADMF to the Delivery Function contains:

- the identity of the target;
- the address for delivery of IRI (= LEA 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 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.

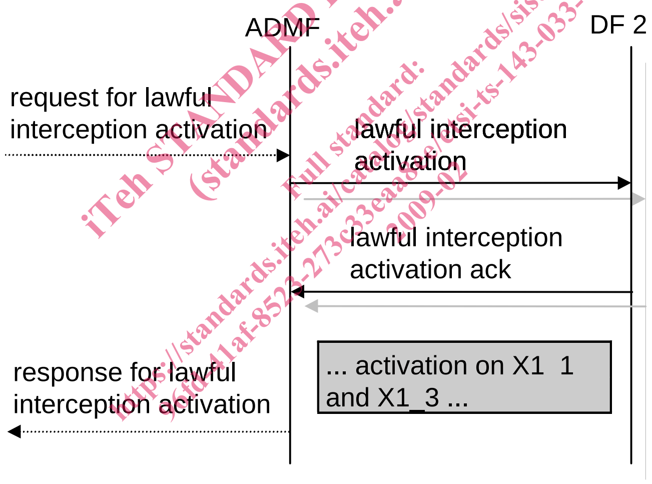

Figure 4: Information flow on X1_2-interface for Lawful Interception activation

5.1.3 X1_3-interface (IP)

For the delivery of circuit switched intercept product the message sent from the ADMF to the Delivery Function contains:

- the identity of the target;
- the address of delivery for IP (= LEA address);
- a DF3 activation identity, which uniquely identifies the activation for delivery function 3 and is used for further interrogation or deactivation, respectively;
- the IA in case of location dependent interception;
- 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.

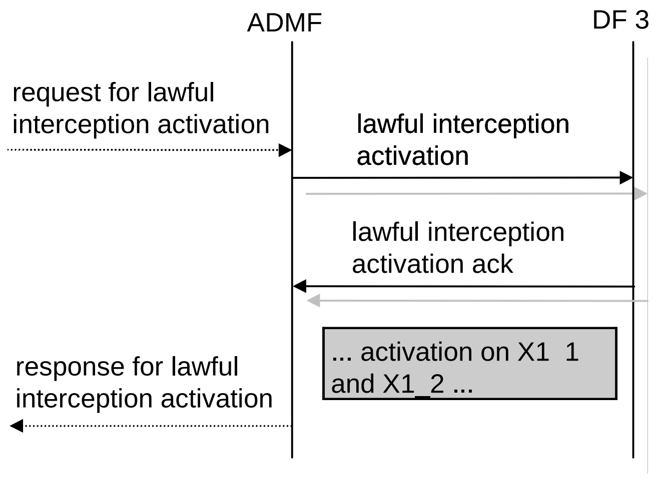

Figure 5: Information flow on X1_3-interface for Lawful Interception activation

5.2 Deactivation

The following picture shows the information flow for the deactivation of the Lawful interception.

5.2.1 X1_1-interface

The messages sent from the ADMF to the MSC/VLR and GMSC for deactivation contains:

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

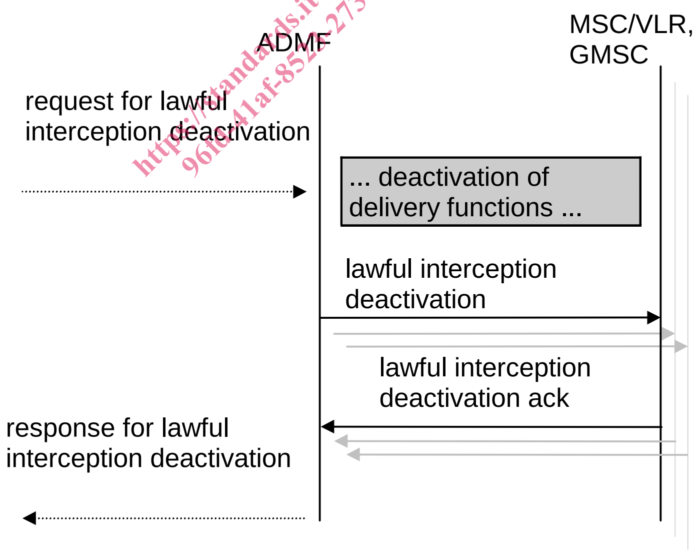

Figure 6: Information flow on X1_1-interface for Lawful Interception deactivation

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 MSC/VLR and the GMSC 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 MSC/VLR and the GMSC except when the activation needs to change from IP and IRI to IP only or IRI only. In that case an activation change message will be sent to the MSC/VLR and the GMSC.