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Introduction

The present document has been produced by the 3GPP TSG SA to standardise Lawful Interception of telecommunications. The present document specifies the architecture and functions required to support Lawful Interception in 3GPP networks. Lawful Interception shall always be done in accordance with the applicable national or regional laws and technical regulations. Such national laws and regulations define the extent to which functional capabilities in the present document are applicable in specific jurisdictions.

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1 Scope

The present document specifies both the architectural and functional system requirements for Lawful Interception (LI) in 3GPP networks. The present document provides an LI architecture supporting both network layer based and service layer based Interception.

National regulations determine the specific set of LI functional capabilities that are applicable to a specific 3GPP operator deployment.

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.
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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System".

[3] 3GPP TS 33.126: "Lawful interception requirements".

[4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[5] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".

[6] OMA MLP: "Mobile Location Protocol V3.3".

NOTE: Available at http://www.openmobilealliance.org.

[7] ETSI TS 103 120: "Lawful Interception (LI); Interface for warrant information".

[8] ETSI TS 103 221-1: "Lawful Interception (LI); Part 1: Internal Network Interface X1 for Lawful Interception".

[9] 3GPP TS 33.501: "Security Architecture and Procedures for the 5G System".

[10] ETSI GR NFV-SEC 011: "Network Functions Virtualisation (NFV); Security; Report on NFV LI Architecture".

[11] 3GPP TS 33.107: "3G Security; Lawful interception architecture and functions".

[12] 3GPP TS 23.214: "Architecture enhancements for control and user plane separation of EPC nodes; Stage 2".

[13] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[14] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[15] 3GPP TS 33.128: "Protocol and Procedures for Lawful Interception; Stage 3".

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 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

Content of Communication (CC): The content of communication as forwarded from the Mediation and Delivery Function 3 (over the LI_HI3 interface) to the Law Enforcement Monitoring Facility.

CUPS: As defined in 3GPP TS 23.214 [12], represents PLMN with architecture enhancements for control and user plane separation of EPC nodes.

Intercept Related Information (IRI): The intercept related information as forwarded from the Mediation and Delivery Function 2 (over the LI_HI2 interface) to the Law Enforcement Monitoring Facility.

IRI event: The network procedure or event that created an xIRI in the Point Of Interception.

LI component: The function and equipment involved in handling the Lawful Interception functionality in the CSP's network.

LI system: The collection of all LI components involved in handling the Lawful Interception functionality in the CSP's network.

Provisioning: The action taken by the CSP to provide its Lawful Interception functions information that identifies the target and the specific communication services of interest to the LEA, sourced from the LEA provided warrant.

Triggering: The action taken by a dedicated function (Triggering Function) to provide another dedicated function (Triggered POI), that Provisioning could not directly be applied to, with information that identifies the specific target communication to be intercepted.

Warrant: The formal mechanism to require Lawful Interception from a LEA served to the CSP on a single target identifier. Depending on jurisdiction also known as: intercept request, intercept order, lawful order, court order, lawful order or judicial order (in association with supporting legislation).

xCC: The content of communication as forwarded from the Point Of Interception (over the LI_X3) interface to the Mediation and Delivery Function 3.

xIRI: The intercept related information as forwarded from the Point Of Interception (over the LI_X2) interface to the Mediation and Delivery Function 2.

3.2 Symbols

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GC	5G Core Network
5GS	5G System
ADMF	LI Administration Function
AMF	Access Management Function
AUSF	Authentication Server Function
CC	Content of Communication
CSI	Cell Supplemental Information
CSP	Communication Service Provider
CUPS	Control and User Plane Separation
DN	Data Network

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GPSI	Generic Public Subscription Identifier
IP	Interception Product
IRI	Intercept Related Information
LALS	Lawful Access Location Services
LEA	Law Enforcement Agency
LEMF	Law Enforcement Monitoring Facility
LI	Lawful Interception
LICA	Lawful Interception Certificate Authority
LICF	Lawful Interception Control Function
LI_HI1	Lawful Interception Handover Interface 1
LI_HI2	Lawful Interception Handover Interface 2
LI_HI3	Lawful Interception Handover Interface 3
LI_HI4	Lawful Interception Handover Interface 4
LIPF	Lawful Interception Provisioning Function
LIR	Location Immediate Request
LI_SI	Lawful Interception System Information Interface
LI_X0	Lawful Interception Internal Interface 0
LI_X1	Lawful Interception Internal Interface 1
LI_X2	Lawful Interception Internal Interface 2
LI_X3	Lawful Interception Internal Interface 3
LMF	Location Management Function
LTF	Location Triggering Function
MDF	Mediation and Delivery Function
MDF2	Mediation and Delivery Function 2
MDF3	Mediation and Delivery Function 3
N3IWF	Non 3GPP Inter Working Function
NPLI	Network Provided Location Information
NR	New Radio
NRF	Network Repository Function
NSSF	Network Slice Selection Function
PCF	Policy Control Function
PEI	Permanent Equipment Identifier
POI	Point Of Interception
SIRF	System Information Retrieval Function
SMF	Session Management Function
SMSF	SMS-Function
SUCI	Subscriber Concealed Identifier
SUPI	Subscriber Permanent Identifier
TF	Triggering Function
UDM	Unified Data Management
UDR	Unified Data Repository
UDSF	Unstructured Data Storage Function
UPF	User Plane Function
xCC	LI_X3 Communications Content
xIRI	LI_X2 Intercept Related Information

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4 Requirements realisation

The LI architecture set out in the present document is designed to allow CSP deployments to meet the set of LI requirements described in TS 33.126 [3] that are determined to be applicable by the relevant national regulation for that deployment. For more details on the relationship between LI requirements and national legislation, see TS 33.126 [3] clause 4.

A CSP may deploy different network technologies or services considered in the present document. A CSP should consider each of these network technologies or services separately with respect to the present document, bearing in mind that a different subset of LI requirements may apply according to relevant national legislation, and that a warrant may require the CSP to intercept multiple network technologies or services.

5 Functional architecture

5.1 General

The following clauses describe the high-level functional architecture for LI for 3GPP-defined services and network technologies. It describes the architectural elements necessary for LI, their roles and responsibilities, and the interfaces and interactions between them.

Clauses 6 and 7 of the present document describe how the LI for various 3GPP-defined network technologies and services are realised within the generic LI architecture, including associations of LI architectural elements with the network functions involved.

Not all LI architectural elements and interfaces are used in all network technologies and services.

5.2 High-level generic LI architecture

The overall conceptual view of LI architecture is shown in figure 5.2-1 below.

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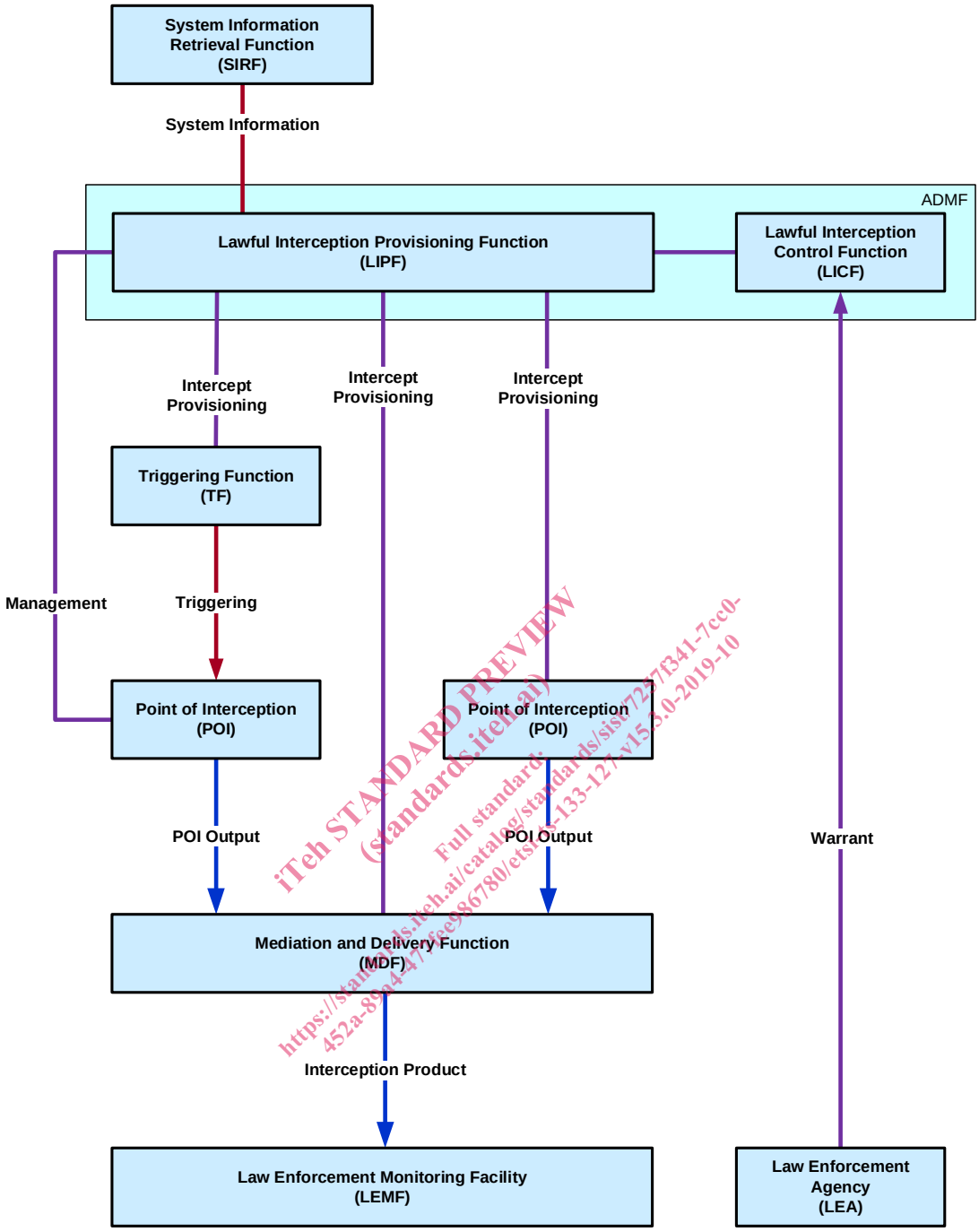

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Figure 5.2-1: A high-level generic view of LI architecture

The functional entities of the architecture are described in more detail in clause 5.3 below. Details of the specific interfaces between these entities are described in clause 5.4.

5.3 Functional entities

5.3.1 Law Enforcement Agency (LEA)

In general the LEA is responsible for submitting the warrant to the CSPs, although in some countries the warrant may be provided by a different legal entity (e.g. judiciary).

5.3.2 Point of Interception (POI)

5.3.2.1 General

The **Point of Interception (POI)** detects the target communication, derives the intercept related information or communications content from the target communications and delivers the POI Output as xIRI to the MDF2 or as xCC to the MDF3. The output of a POI is determined by the type of the NF associated with the POI. A POI may be embedded within a Network Function (NF) or separate from a NF with which it is associated.

Multiple POIs may have to be involved in executing a warrant.

5.3.2.2 Directly provisioned and triggered POIs

POIs are divided into two categories:

- Directly provisioned POIs are provisioned by the LIPF.
- Triggered POIs are triggered by a Triggering Function (TF) (see clause 5.3.3).

The directly provisioned POIs detect the target's communications that need to be intercepted, and then derive the intercept related information or communication contents from that target communications depending on the POI type (see clause 5.3.2.3). The triggered POIs detects the target communications based on the trigger received from an associated Triggering Function and then derives the intercept related information or communication contents of target communications depending on the POI type (see clause 5.3.2.3).

5.3.2.3 IRI-POIs and CC-POIs

POIs are divided into two types for each category based on the type of data they send to the MDF (see clause 5.3.4):

- IRI-POI delivers xIRI to the MDF2.
- CC-POI delivers xCC to the MDF3.

Both IRI-POIs and CC-POIs are either directly provisioned or triggered (see clause 5.3.2.2).

5.3.2.4 Failure handling

In case a network procedure involving the target UE and requiring the generation of an xIRI fails, the IRI-POI shall be able to report the failure reason available from the involved network protocol.

5.3.3 Triggering Function

The Triggering Function is provisioned by the LIPF and is responsible for triggering triggered POIs in response to network and service events matching the criteria provisioned by the LIPF. The Triggering Function detects the target communications and sends a trigger to the associated triggered POI.

As a part of this triggering, the Triggering Function shall send all necessary interception rules (i.e. rules that allow the POIs to detect the target communications), forwarding rules (i.e. MDF2, MDF3 address), target identity, and the correlation information.

A Triggering Function may interact with other POIs to obtain correlation information. Details of this interface are not specified by the present document.

The Triggering Function that triggers CC-POI is referred to as a CC-TF and the Triggering Function that triggers an IRI-POI is referred to as IRI-TF.

5.3.4 Mediation and Delivery Function (MDF)

The **Mediation and Delivery Function (MDF)** delivers the Interception Product to the Law Enforcement Monitoring Facility (LEMF).

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