SOURCE:	ETSI
TITLE:	Lawful Interception and Retained Data Handover Interface standardisation
AGENDA ITEM:	Opening 8.3
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Lawful Interception in ETSI

Short introduction on ETSI/TC LI Lawful Interception and Retained Data Handover standardisation

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Why Lawful Interception implementation in EU

**17th January 1995: EU Council of Ministers
adopted resolution COM 96/C329/01 on Lawful Interception**

The providers of public telecommunications networks and services are legally required to make available to the authorities the information necessary to enable them to investigate telecommunications

Main body in ETSI for LI Standards development and coordination is
ETSI/TC LI

Why standardisation of LI handling

- **Easier to define own LI mechanism**
  - Guidance is given for network architecture
  - No need to define/invent complete own LI system
  - National options are possible
- **Less expensive LI products**
  - Manufacturers need to develop one basic product
  - National options are additional
- **Intercepted result is meeting international requirements by Law Enforcement Agencies**
  - Worldwide input
- **LI Standards in ETSI are actively developed and approved by involved parties**

History of Lawful Interception work in ETSI

❏ **ETSI/Technical Committee Security (TC SEC)**

  ➢ **Working Group Lawful Interception (SEC-WGLI) (1997)**

    • **TR 101 944 v1.1.2   TR 102 053 v1.1.1   ES 201 158 v1.2.1**

❏ **ETSI/Technical Committee Lawful Interception (TC LI)**

  ➢ **Established as stand-alone TC in Oct 2002**

    • **TR 101 943 v2.2.1   TR 102 503 v1.2.1   TR 102 519 v1.1.1**
    • **TS 101 331 v1.2.1   TS 101 671 v2.15.1   ES 201 671 v3.1.1**
    • **TR 102 528 v1.1.1**
    • **TS 102 232-1 v2.1.1   TS 102 232-2 v2.2.1   TS 102 232-3 v2.1.1**
    • **TS 102 232-4 v2.1.1   TS 102 232-5 v2.1.1   TS 102 232-6 v2.2.1**

Terms of Reference ETSI/TC LI

❑ **To capture the requirements of "Law Enforcement Agencies" and translating those into requirements to be applied to technical specifications**

❑ **To develop and publish handover interfaces, and rules for the carriage of technology specific interception across these interfaces**

❑ **To develop a set of standards that allow ETSI standards to support industry compliance to the requirements of national and international law**

How ETSI/TC LI operates

- ❑ **Meetings**
  - ➢ **Three plenary meetings a year are organised (35-70 participants)**
  - ➢ **In between if necessary Rapporteur's meetings can be organised on a specific issue**
- ❑ **The meetings can be attended by ETSI members**
  - ➢ **Non-ETSI members can participate by invitation of the chairman**
- ❑ **Dedicated TC LI E-mail server and FTP server**
  - ➢ **Open to all registered ETSI (full and associated) members**
- ❑ **Producing reports and specifications on Lawful Interception and Retained Data**
- ❑ **Promoting globally ETSI Lawful Interception standards amongst operators and national bodies**
  - ➢ **LI Presentations at Workshops and Conferences**

Participation in ETSI/TC LI

- **Law Enforcement Agencies / Governments organisations**
  - NL, UK, DE, AS, S, GR, ES, FR, RU, FIN, IT, NO, CY, HU
  - USA, CA, AU, KR
- **Operators**
  - KPN (NL), DT (DE), BT (UK), TeliaSonera (S), Inmarsat, Telenor (NO), UPC, Telecom Italia, Telstra (AU), T-Mobile (DE), Vodafone (DE)
- **Manufacturers (switch)**
  - Nokia Siemens Networks, Ericsson, Cisco, Alcatel Lucent, Nortel, Marconi, Motorola
- **Manufacturers (mediation / LEA equipment)**
  - Pine Digital Security, Aqsacom, ETI, VeriSign, Siemens, GTEN, Utimaco Safeware, Verint, Detica, NICE Systems, Thales, AREA, ATIS Systems, SS8, Spectronic, Group 2000, ZTE

    Manufacturers may be active in all areas

Activities in ETSI/TC LI
on
Lawful Interception

LEA requirements (step 1)

❑ *ETSI TS 101 331*
Requirements of Law Enforcement Agencies
  ➢ **Provides guidance in the area of co-operation by network operators/service providers with the lawful interception of telecommunications**
  ➢ **Provides a set of requirements relating to handover interfaces for the interception**

Types of Lawful Intercepted data
(TS 101 331)

- **Content of Communication (CC)**
  - ➢ **Information exchanged between two or more users of a telecommunications service**
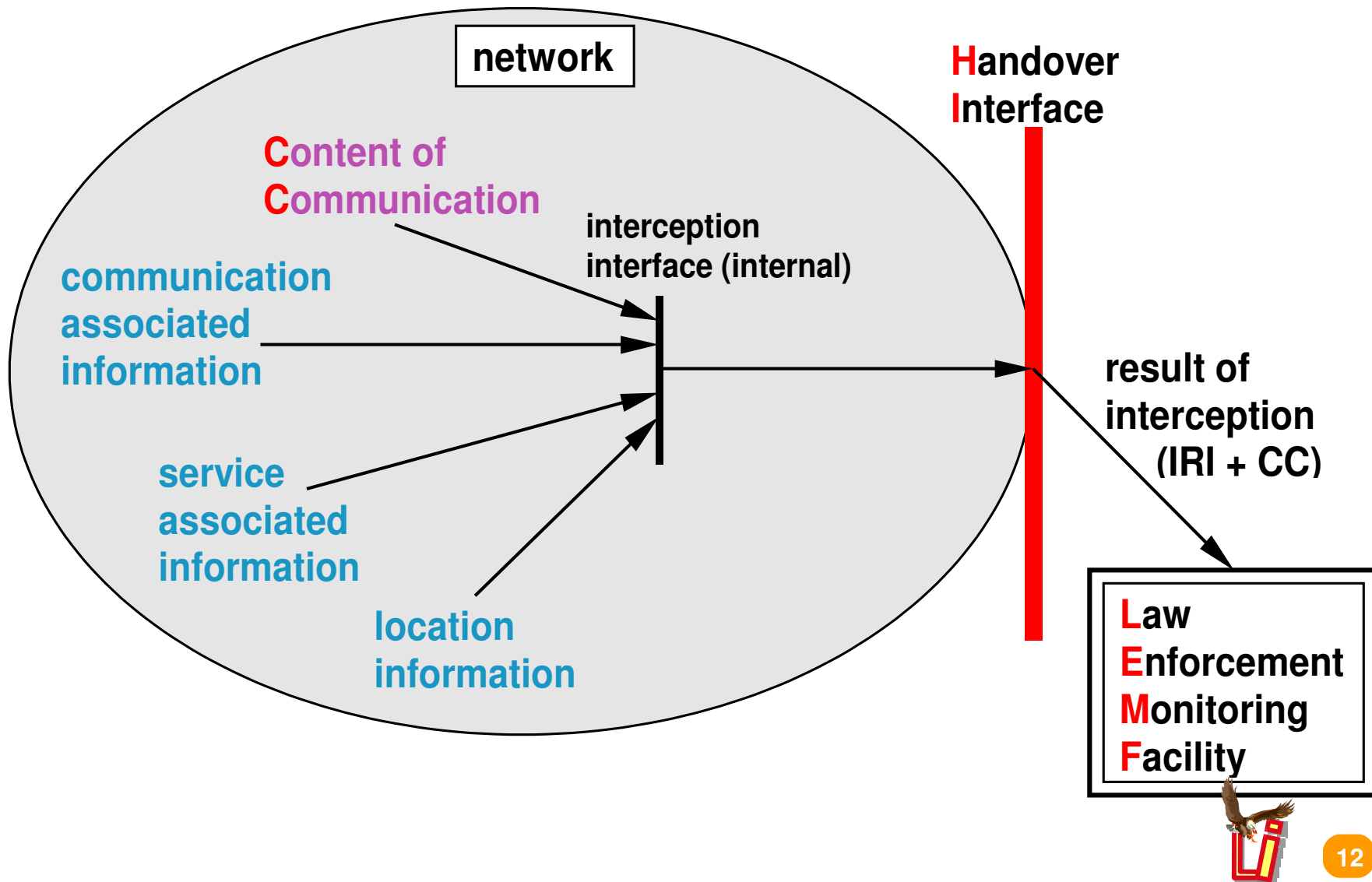
- **Intercept Related Information (IRI)**
  - ➢ **Collection of information or data associated with telecommunication services involving the target identity:**
    - • **communication associated information** or data (including unsuccessful communication attempts)
    - • **service associated information** or data (e.g. service profile management by subscriber)
    - • **location information**

General network arrangements
(TS 101 331)

network

Handover
Interface

Content of
Communication

interception
interface (internal)

communication
associated
information

service
associated
information

location
information

result of
interception
(IRI + CC)

Law
Enforcement
Monitoring
Facility

General on security of LI feature

- ❑ **Protection of Target information**
  - ➢ **Protection of Rooms, Systems, Connections, Signalling**
- ❑ **Local staff**
  - ➢ **Only authorised personnel may have knowledge that interception has been activated on a target**
  - ➢ **Unauthorised persons shall not be able to detect that any interception is active on certain subscribers**
- ❑ **Parties in the communications**
  - ➢ **Neither the target nor the other parties involved in the communications should be able to detect that interception is (de)activated or that interception is taking place**
- ❑ **Other users**
  - ➢ **Other users of any telecommunications service should not be able, by any means, to detect that any interception facility has been (de)activated or that interception is taking place**

Actual Security work item in TC LI

- **☐ *ETSI DTR/LI-00044***
  Security framework in Lawful Interception and Retained Data environment
  - ➤ **defining a security framework for securing Lawful Interception and Retained Data environment of the CSP and the Handover of the information**

  CSP= Communication Service Provider

LI Handover Interface (step 3)

❑ *ETSI TS 101 671 (ETSI ES 201 671)*
   Handover Interface for the Lawful Interception of Telecommunications Traffic

  ➤ **Generic flow of information and procedures and information elements, applicable to any future telecommunication network or service**

  ➤ **Circuit switched and packet data**

  ➤ **Covered technologies:**
     PSTN, ISDN, GSM, UMTS (CS), GPRS, TETRA
     wireline NGN (including PSTN/ISDN emulation)
     wireline IMS PSTN simulation

❑ *ETSI TR 102 053*
   Notes on ISDN LI functionalities

  ➤ **Implementation advice of TS 101 671 for operators**

Handover Interface ports
(TS 101 671)

- ❑ **HI1: for administrative information**
  - ➢ **Request for lawful interception:
    target identity, LIID, start/duration, IRI or IRI+CC,
    IRI delivery address, CC delivery address, ...**
  - ➢ **Management information**

- ❑ **HI2: for delivery of Intercept Related Information**
  - ➢ **All data related to establish the telecommunication service and to control its progress**
  - ➢ **Correlation information**

- ❑ **HI3: for delivery of Content of Communication**
  - ➢ **Transparent en-clair copy of the communication**
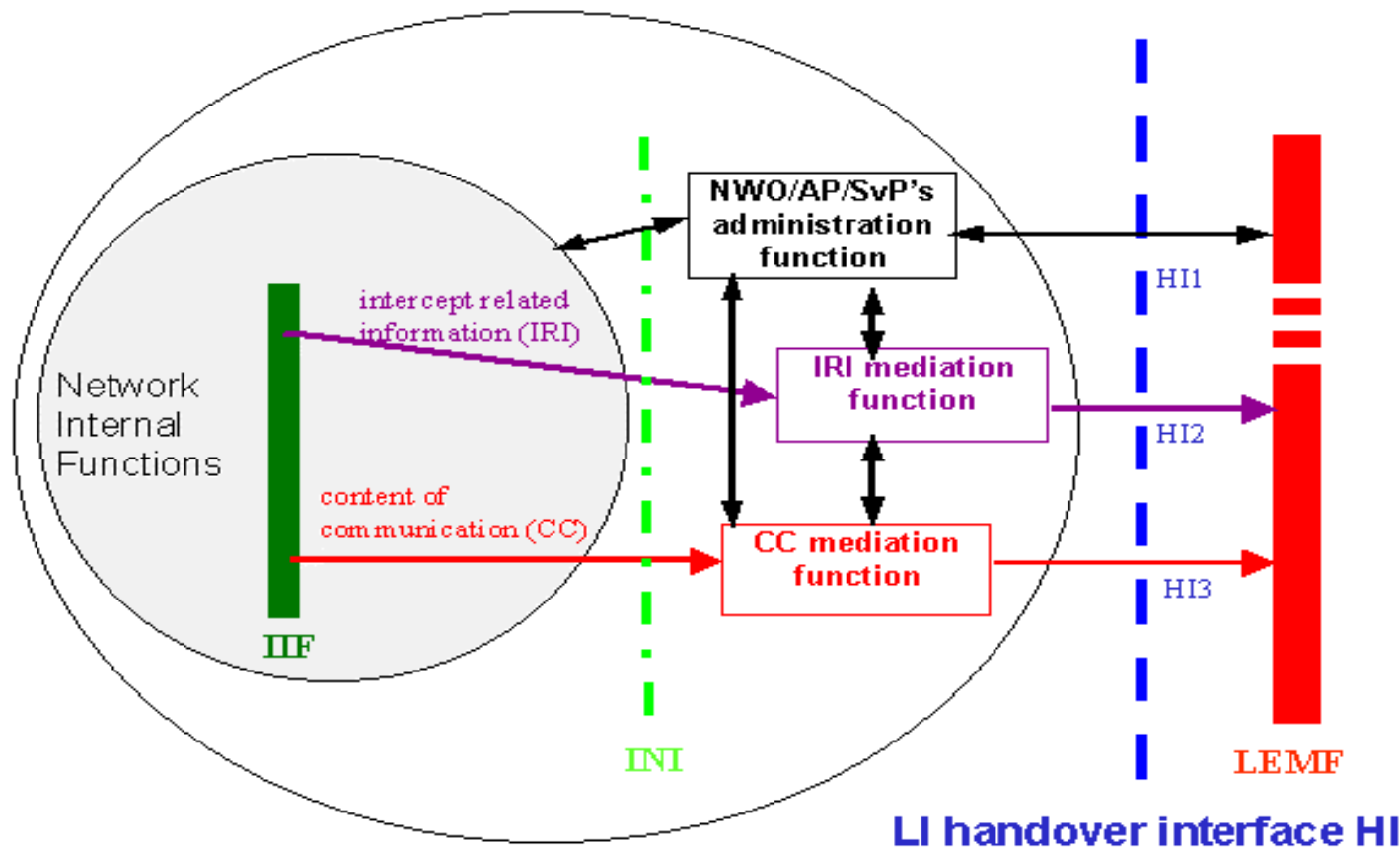 - ➢ **Correlation information**

Handover Interface Concept *(TS 101 671)*

IIF: internal interception function
INI: internal network interface

HI1: administrative information
HI2: intercept related information
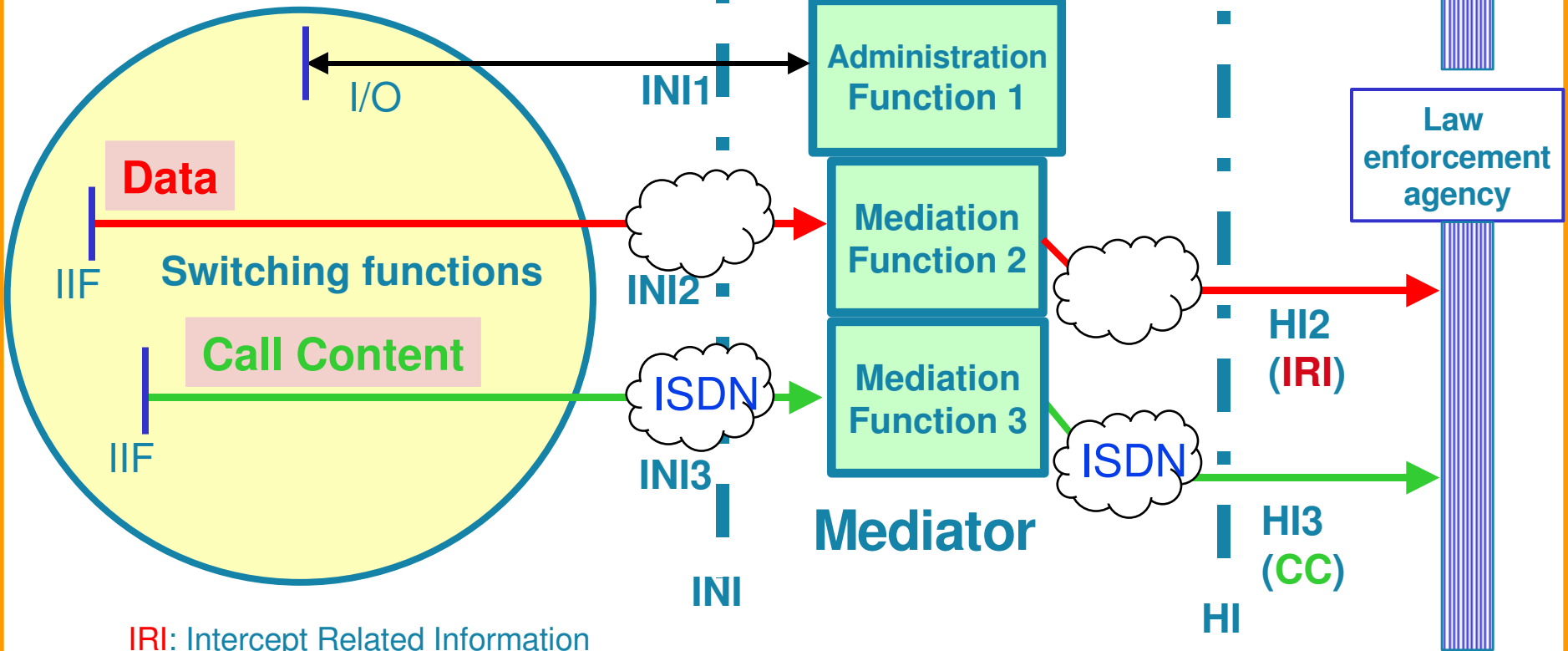HI3: content of communication

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Parameters in IRI records
(TS 101 671)

- **LI related identities**
  - ➢ **LIID, target, network operator, network element, call ID, ...**
- **Timestamp**
- **Intercepted call direction (to / from target)**
- **Intercepted call state (in progress, connected)**
- **Address: Calling party / Called party / Forwarded-to-party / ..**
  - ➢ **E164, TEI, IMSI, IMEI, MSISDN, SIP URI, …**
- **Ringing tone duration / conversation duration**
- **Type of intercept:**
  - ➢ **PSTN, ISDN, GSM (CS), TETRA, GPRS (PD), UMTS (CS)**
- **Supplementary service information**
- **Location information**
- **National parameters**
- **IRI record type (Begin, Continue, End, Report)**
- **....**

Interception network ISDN/PSTN Services step-by-step

Management System

Authorisation authority / Law enforcement agency

Warrant

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AI

HI1

I/O

INI1

Administration Function 1

Data

IIF

Switching functions

INI2

Mediation Function 2

Law enforcement agency

HI2 (IRI)

Call Content

IIF

ISDN

INI3

Mediation Function 3

ISDN

HI3 (CC)

Mediator

INI

HI

IRI: Intercept Related Information
CC: Content of Communication
INI: Internal Network Interface
IIF: Internal Intercepting Function
AI: Administrative Interface

HI: Handover Interface
HI1: Administration
HI2: Intercept Related Information
HI3: Content of Communication

Architecture Reports from TC LI

- *ETSI TR 101 943*
  Concepts of Interception in a Generic Network Architecture
  - High-level informative overview and principles regarding implementation of LI for telecommunications

- *ETSI TR 102 528*
  Interception domain Architecture for IP networks
  - High level reference architecture for supporting lawful interception for IP networks
  - High level description of Internal Network Functions and Interfaces.
  - Application of the reference model to voice and multimedia over IP services, data layer 3 and layer 2 services
  - Reference model in the network operator and communication service provider domain

Reference model for LI in IP networks *(TR 102 528)*

CSP Domain

LEA Domain

HI

LI Administration Function (AF)

HI1

Authorisation authority / Law Enforcement Agency

INI1b

INI1a

INI1c

Intercept Related Information Internal Interception Function (IRHIF)

INI2

Lawful Interception Mediation Function (MF)

CCTI

Content of Communication Trigger Function (CCTF)

CCCI

Content of Communication Internal Interception Function (CGIIF)

INI3

HI2 (**IRI**)

Law Enforcement Agency

HI3 (**CC**)

Handover of LI via IP Networks (step 3)

- *ETSI TS 102 232 part 01 (formerly TS 102 232)*
  Delivery of IP based interception
  - General aspects of handover for HI2 and HI3
    (as defined by TS 101 671) where the underlying transport system is based on the Internet Protocol stack.
  - Modular approach used for specifying IP based handover interfaces
  - Header(s) to be added to IRI and CC sent over the HI2 and HI3 interfaces
  - Protocols for the transfer of IRI and CC across the handover interfaces
  - To be used in conjunction with other deliverables that define the service-specific IRI data formats
  - Protocol is defined according ASN.1 description
    ITU-T Recommendation X.680 (Abstract Syntax Notation One)

Generic header information
(TS 102 232-1)

❑ **Generic header information to be added to HI2 and HI3 traffic**

- ➤ **LIID**
- ➤ **Authorization country code**
- ➤ **Communication Identifier**
- ➤ **Sequence number**
- ➤ **Timestamp**
- ➤ **Payload direction**
- ➤ **Payload type**
- ➤ **Interception Type**
- ➤ **IRI record type (Begin, Continue, End, Report)**
- ➤ **...**

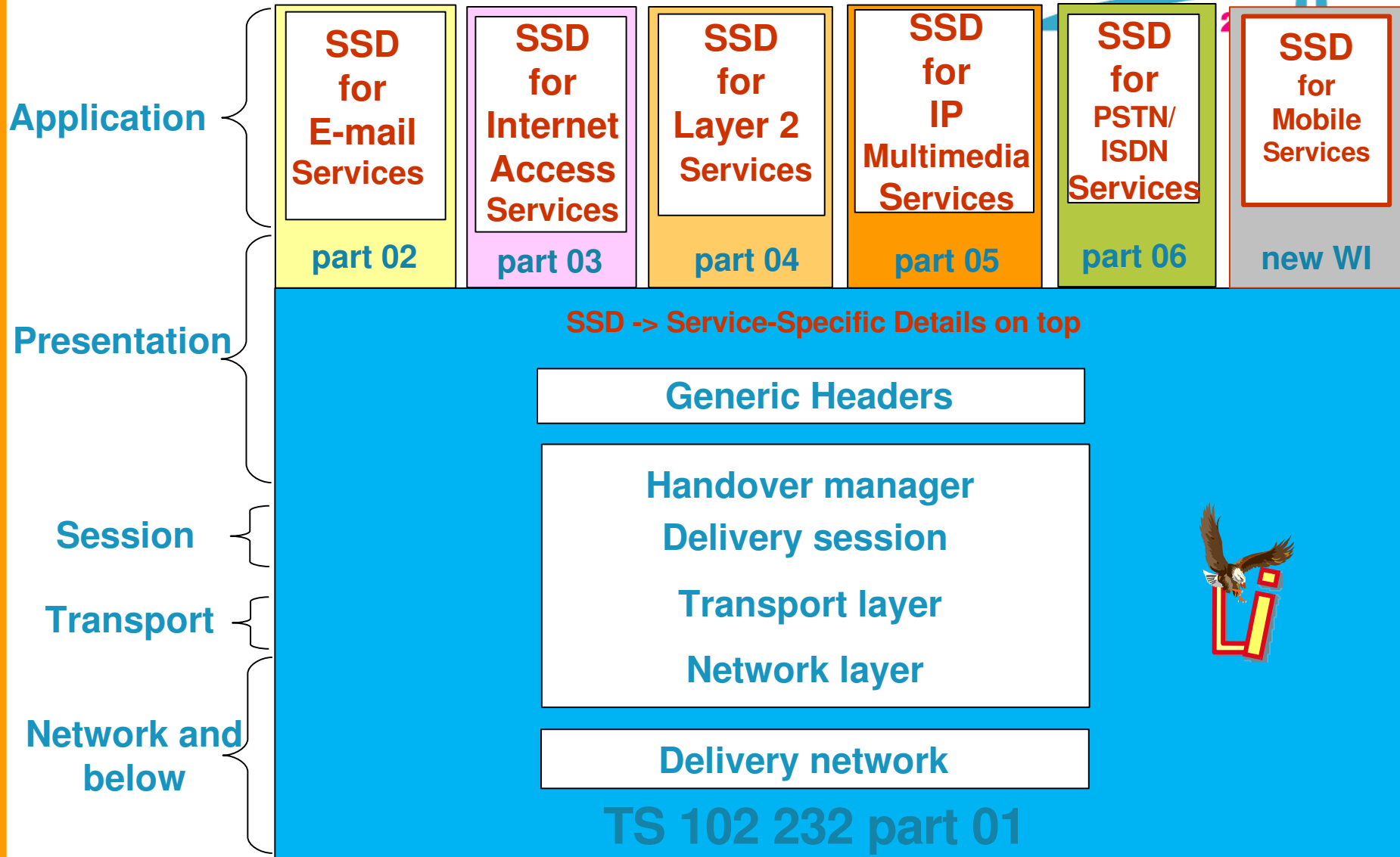# IP service-specific details (applications)

- ❑ *ETSI TS 102 232 part 02*   *(formerly TS 102 233)*
  Service-specific details for **E-Mail** Services
  - ➢ **Description for handover of E-mail messages; MTP, POP3, IMAP4**

- ❑ *ETSI TS 102 232 part 03*   *(formerly TS 102 234)*
  Service-specific details for **Internet Access** Services
  - ➢ **Description for handover of Internet Access Information and TCP/IP information; DHCP, RADIUS**

- ❑ *ETSI TS 102 232 part 04*   *(formerly TS 102 815)*
  Service-specific details for **Layer 2** Services
  - ➢ **Description for LI functionality of Layer 2 access**

- ❑ *ETSI TS 102 232 part 05*
  Service-specific details for **IP Multimedia** Services
  - ➢ **Based on SIP and RTP, and services described by ITU-T H.323, H.248**

- ❑ *ETSI TS 102 232 part 06*

TS 102 232 IP HO Family

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Application

SSD for E-mail Services	SSD for Internet Access Services	SSD for Layer 2 Services	SSD for IP Multimedia Services	SSD for PSTN/ISDN Services	SSD for Mobile Services
part 02	part 03	part 04	part 05	part 06	new WI

Presentation

SSD -> Service-Specific Details on top

Generic Headers

Session

Handover manager

Delivery session

Transport

Transport layer

Network layer

Network and below

Delivery network

TS 102 232 part 01

LI possibility on a VoIP MM platform

Authorisation Authority / Law Enforcement Agency

Management System

Warrant

Law Enforcement Agency

MGW

SIP Server

LI Administration Function

LI Mediation Function

IRI

CC

MGW

SIP ①

LI Switch

rtp ②

SIP   rtp

①

LI data gathering function

②

switch + (SPAN)

RG

cmd

rtp ③

SBC

SBC

1) All SIP messages are copied over SPAN ports via the LI Switch to the LI Data Gathering Function
2) All rtp is copied to the LI Switch and if needed to the GF
3) If needed intercepted rtp (local SBC traffic) is copied from the SBC to the LI Data Gathering Function

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LI specifications in 3GPP (UMTS)

❑ *ETSI TS 133 106*   *(3GPP TS 33.106)*
  Lawful interception requirements
  ➢ **provides basic interception requirements**
  ➢ **partly based on ETSI TS 101 331**

❑ *ETSI TS 133 107*   *(3GPP TS 33.107)*
  Lawful interception architecture and functions

❑ *ETSI TS 133 108*   *(3GPP TS 33.108)*
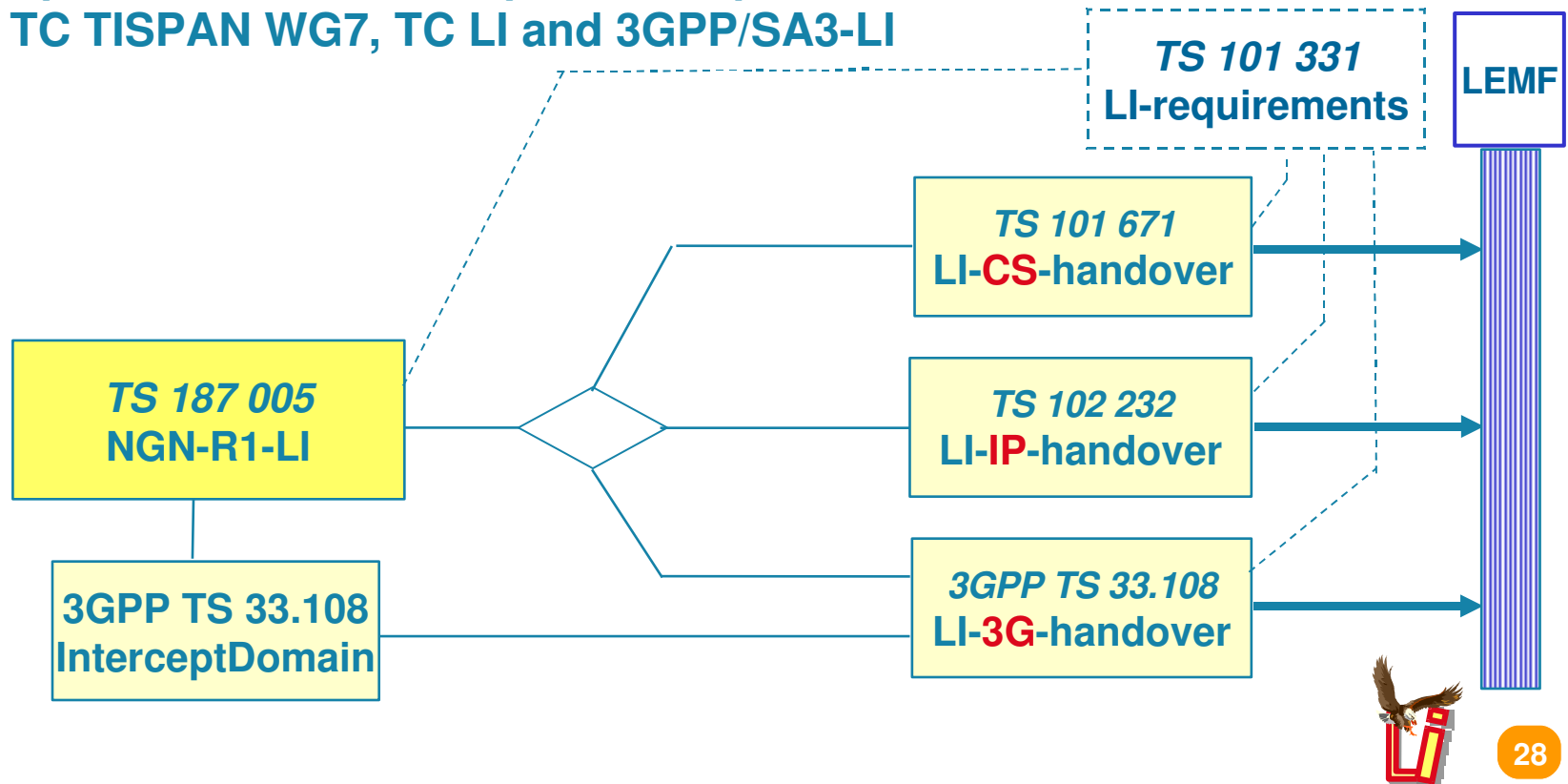 **Handover interface for Lawful Interception**

NGN Lawful Interception

❑ *ETSI TS 187 005   (TC TISPAN)*
NGN Lawful Interception; Lawful Interception functional entities, information flow and reference points

➢ **Specification is developed in cooperation between TC TISPAN WG7, TC LI and 3GPP/SA3-LI**

TS 101 331
LI-requirements

LEMF

TS 101 671
LI-CS-handover

TS 187 005
NGN-R1-LI

TS 102 232
LI-IP-handover

3GPP TS 33.108
InterceptDomain

3GPP TS 33.108
LI-3G-handover

Actual LI working/study issues
TC LI

- *ETSI DTS/LI-00042-7   (to become -> TS 102 232 part 07)*
  Service-Specific Details for Mobile Services (IP HandOver)

- **Maintenance of existing LI specifications**
  - **especially TS 101 331, TS 101 671 (CS) and TS 102 232-family (IP)**

- **Work may be started on Service-Specific Details for Lawful Interception related to IP-TV**

- *ETSI DTR/LI-00044*
  Security framework in Lawful Interception and Retained Data environment

Activities in ETSI/TC LI
on
Retained Data Handover Interface

Why study on Retained Data in EU

**15th of March 2006: the European Parliament
and the Council of the European Union adopted
Directive 2006/24/EC on Data Retention**

**Data generated or processed in connection with
the provision of
publicly available electronic communications services or of
public communications networks
need to be retained**

Applicability Directive

❑ **The content of the communication is not part of the directive**

❑ **Data to be Retained**
  - ➤ **Successful and unsuccessful communication attempts**
  - ➤ **Wireline network telephony**
  - ➤ **Wireless network telephony**
  - ➤ **Internet access**
  - ➤ **Internet e-mail**
  - ➤ **Internet telephony**

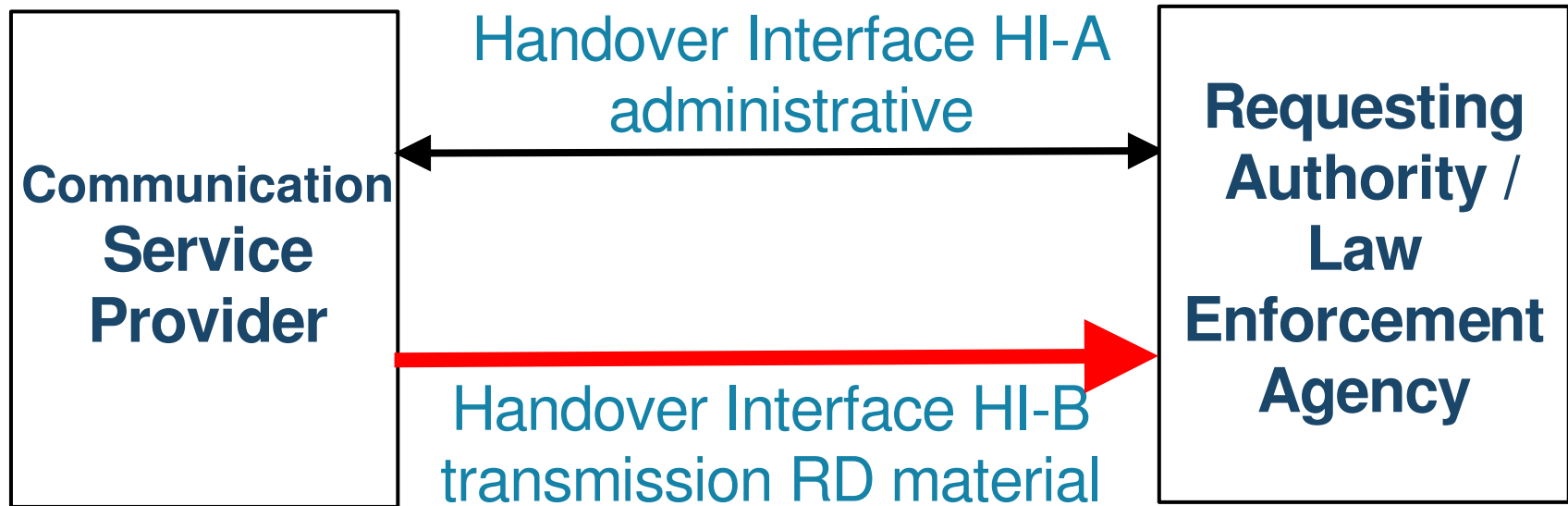❑ **Proportional requirements shall be defined by each Member State in its national law**

Categories of data to be retained

❑ **data to trace and identify the source of a communication**

❑ **data to identify the destination of a communication**

❑ **data to identify the date, time and duration of a communication**

❑ **data to identify the type of communication**

❑ **data to identify users' communication equipment or what purports to be their equipment**

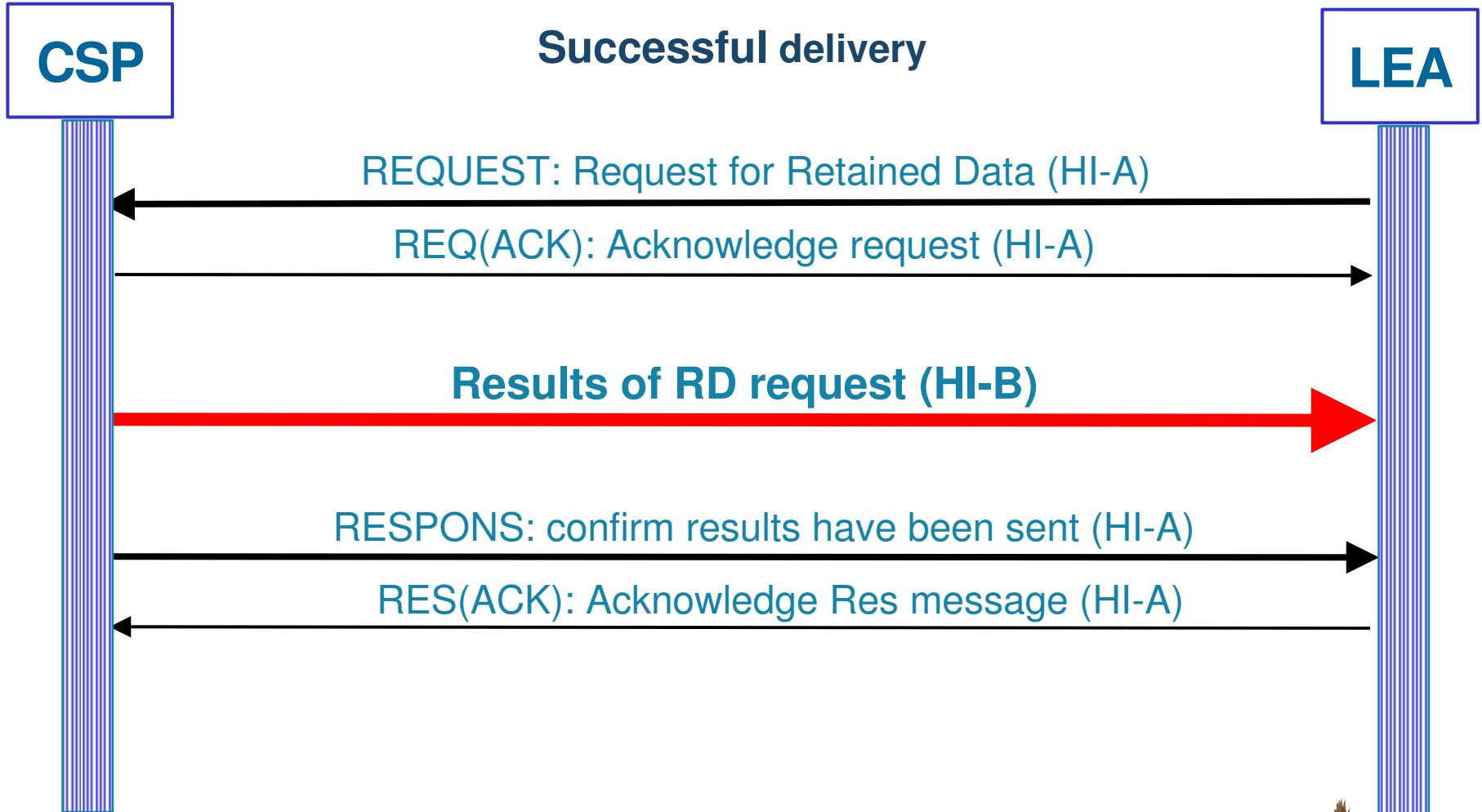❑ **data to identify the location of mobile communication equipment**

Retained Data Handover Interface

Communication **Service Provider**

Handover Interface HI-A administrative

Handover Interface HI-B transmission RD material

Requesting Authority / Law Enforcement Agency

Retained Data Handover Signalling principle

Successful delivery

CSP ← REQUEST: Request for Retained Data (HI-A) ← LEA

CSP → REQ(ACK): Acknowledge request (HI-A) → LEA

Results of RD request (HI-B) →

RESPONS: confirm results have been sent (HI-A) →

← RES(ACK): Acknowledge Res message (HI-A)

Modular approach RDHI specification

Framework for Retained Data Handover Interface

| Annex on PSTN / ISDN services | Annex on GSM and other mob services | Annex on Internet access services | Annex on Internet e-mail services | Annex on IP Multi-media services |

Actual RD working/study issues in TC LI

- *ETSI DTS/LI-00039*
  Requirements of LEAs for handling Retained Data
  - guidance and requirements for the delivery and associated issues of retained data of telecommunications and subscribers
  - set of requirements relating to handover interfaces for retained data
  - requirements to support the implementation of Directive 2006/24/EC
- *ETSI DTS/LI-00033*
  Handover interface for the request and delivery of retained data
  - handover requirements and handover specification for the data that is identified in EU Directive 2006/24/EC on retained
  - considers both the requesting of retained data and the delivery of the results
  - defines an electronic interface

More details on ETSI/TC LI can be found on:
http://portal.etsi.org/li/Summary.asp

Chairman TC LI: Peter@lawfulinterception.com
                              Peter@DataRetention.eu

LI specifications and reports are freely downloadable from
ETSI Website *http://pda.etsi.org/pda/queryform.asp*