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Indo-European dialogue on
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Emerging Technologies
(Growth, Profitability & Nation Building)
13-14th March 2014 • New Delhi, INDIA
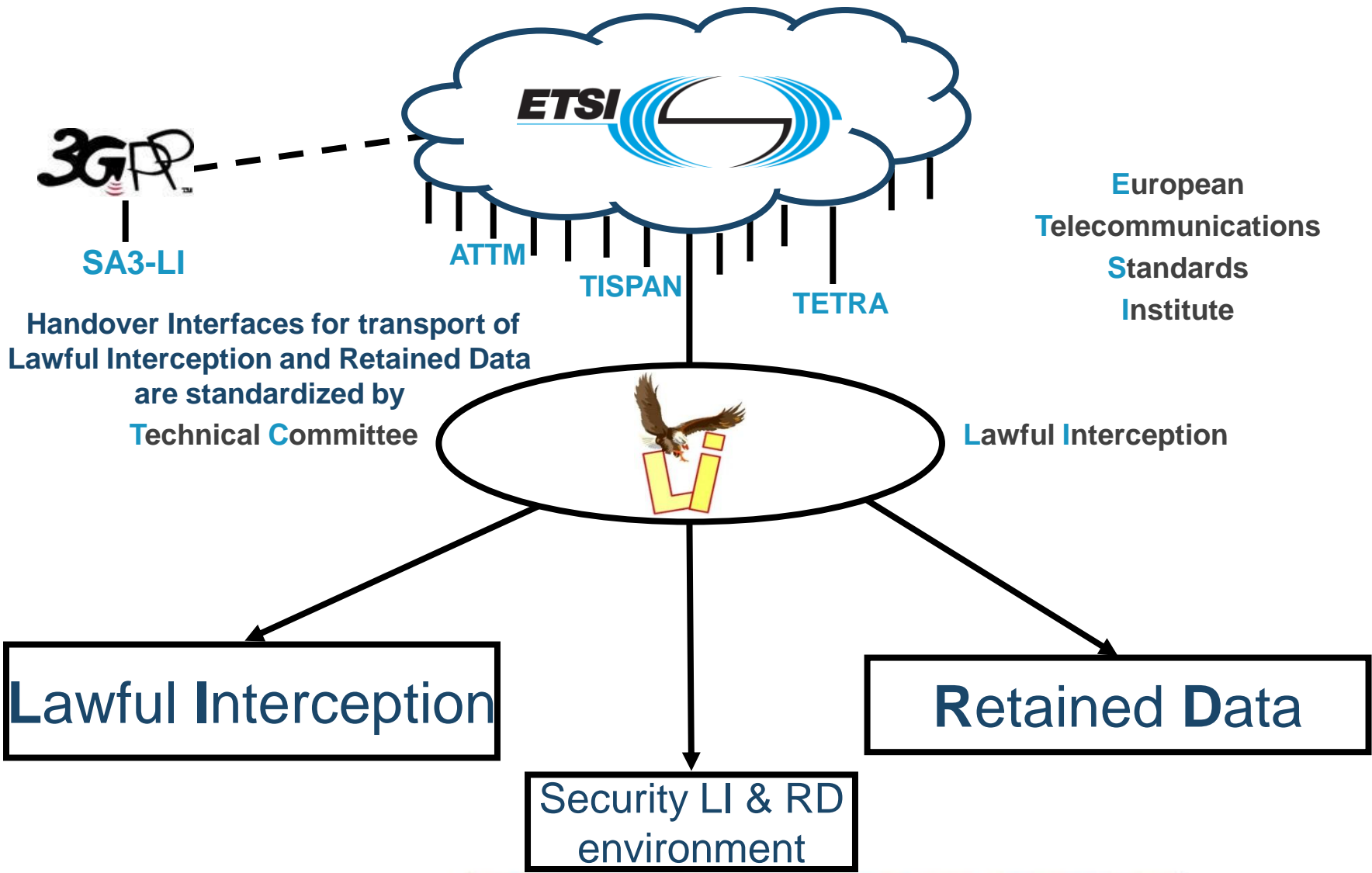
IN THE FRAMEWORK OF

Project
SESEI

http://eustandards.in/

ETSI LI Standards Overview

Alex Leadbeater - Chairman 3GPP SA3LI

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What is LI/DR/DD

❖ Lawful Interception (LI) is the real-time capture of a Target's use of communications (including location) and real-time delivery of those communications to law enforcement.

❖ Data Retention (DR) is holding of customer information and service usage records for a period of time for the use by law enforcement.

❖ Data Disclosure (DD) is handover of Retained Data (RD) or other customer data held by the CSP for business purposes.

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LI in ETSI

ETSI

3GPP

- - - (dashed line to ETSI cloud)

SA3-LI

ATTM

TISPAN

TETRA

European
Telecommunications
Standards
Institute

Handover Interfaces for transport of Lawful Interception and Retained Data are standardized by
Technical Committee

Lawful Interception

Lawful **I**nterception

Retained **D**ata

Security LI & RD environment

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ETSI Lawful Interception Groups

- ❖ ETSI TC LI – Recognised global centre of excellence for Lawful Interception
  - ❖ Specialises in LI & RD handover standards
  - ❖ Global use of TC LI standards
  - ❖ Global participation
- ❖ 3GPP SA3-LI – GSM,GPRS, 3G, LTE Mobile
  - ❖ Architecture and handover

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TC LI – Why Globally Successful

❖ Challenges and requirements globally aligned
- ❖ Underlying LEA requirements similar

❖ Inclusivity
- ❖ Global LEA, CSP & Manufacturer involvement
- ❖ India C-DOT now welcomed as a member of ETSI TC LI

❖ Privacy & Proportionality
- ❖ CSP Controlled model
- ❖ Target based surveillance.
- ❖ Industry standard evidential handover HI2, HI3.

❖ Ahead of the curve

❖ Reduced cost – CSPs and LEAs.

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Deliverables of ETSI TC LI

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

   ❖ **on Lawful Interception:**

      ❖ *TR 101 943*   *TR 102 503*   *TR 102 053*

      ❖ *TS 101 331*   *ES 201 158*

      ❖ *TS 101 671*   *ES 201 671*

      ❖ *TR 102 528*   *TR 102 519*   *TR 103 690*

      ❖ *TS 102 232-1*   *TS 102 232-2*   *TS 102 232-3*

      ❖ *TS 102 232-4*   *TS 102 232-5*   *TS 102 232-6*

      ❖ *TS 102 232-7*

   ❖ **on Data Retention:**   *TS 102 656*   *TS 102 657*

   ❖   *TR 103 657*

   ❖ *Security Report on LI and DR:*   *TR 102 661*

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Why LI implementation in the 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
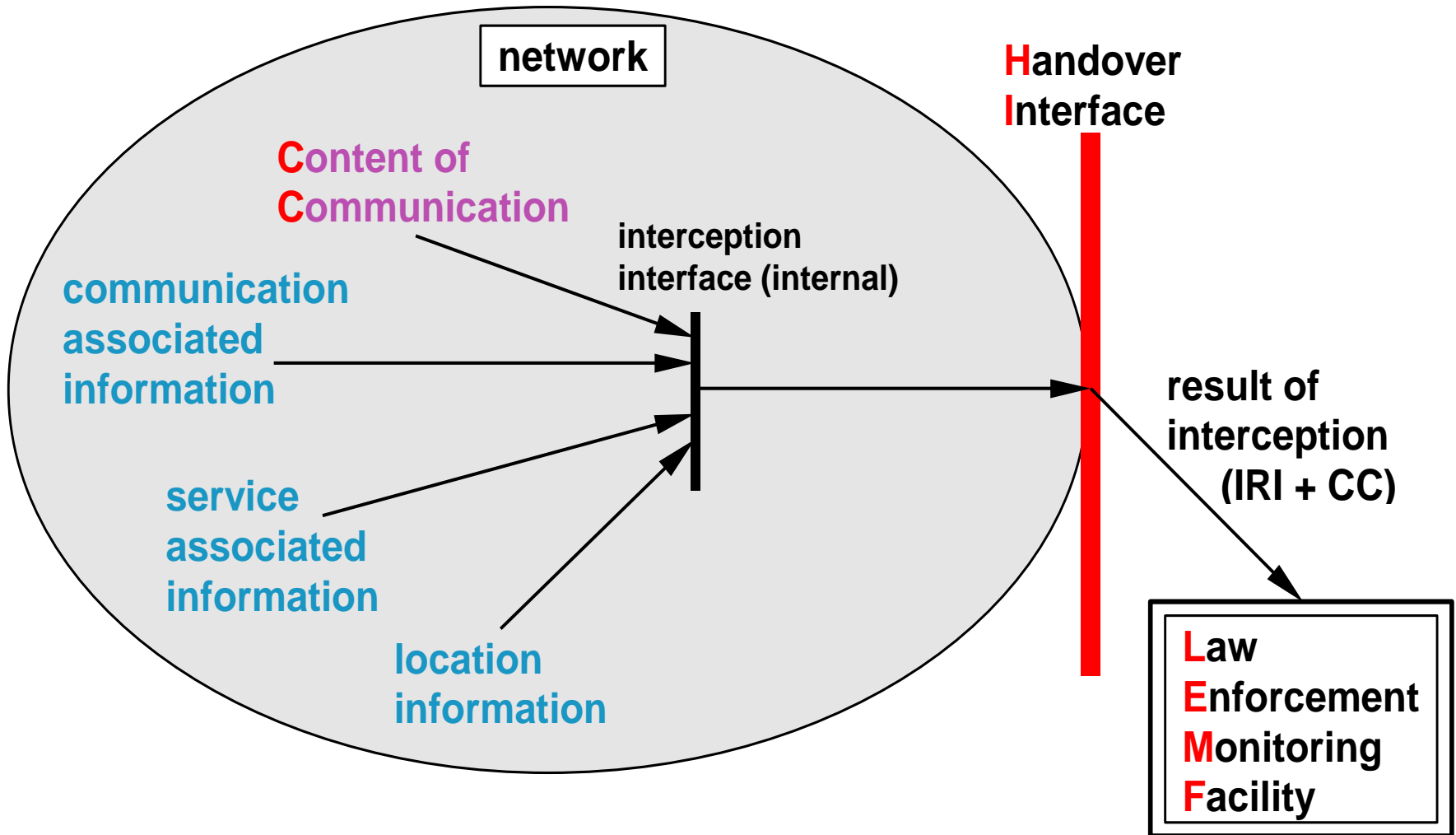necessary to enable them to investigate telecommunications**

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Types of LI data

- ❖ **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**

- ❖ **Content of Communication (CC)**
  - ❖ **information exchanged between two or more users of a telecommunications service**

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General Network Arrangement

network

Content of Communication

interception interface (internal)

Handover Interface

communication associated information

result of interception (IRI + CC)

service associated information

location information

Law Enforcement Monitoring Facility

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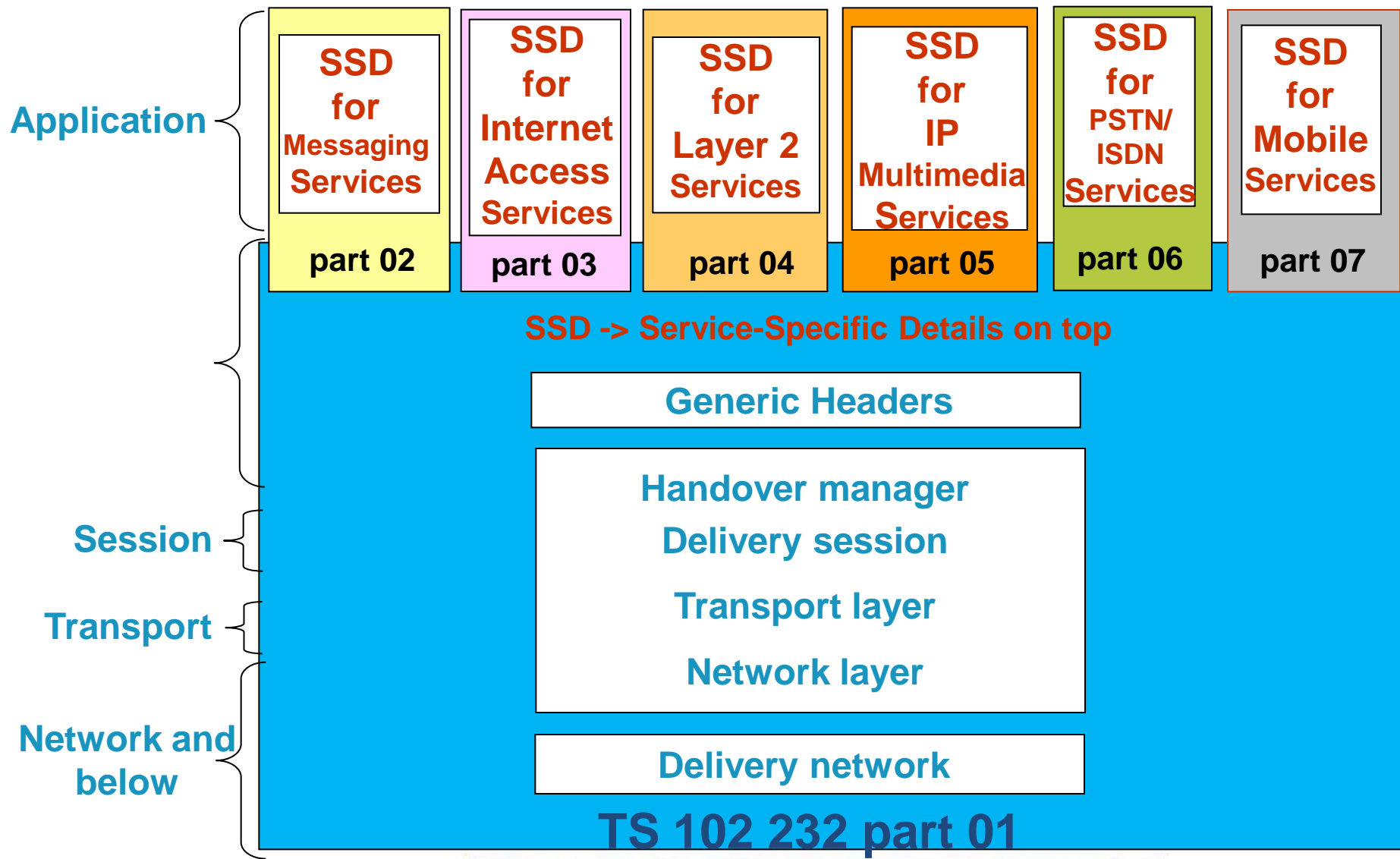
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LI Handover Interface specification

❖ *ETSI TS 101 671*   *(= old 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**

  ❖ **wire line NGN (including PSTN/ISDN emulation)**

  ❖ **wire line IMS PSTN simulation**

❖

 ❖ **Used for legacy mainly non-IP technologies.**

 ❖ **Not designed for handover of VoIP or other modern IP services.**

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Handover of LI over IP services TS 102 232 family (7 parts)

Application

SSD for Messaging 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	part 07

SSD -> Service-Specific Details on top

Generic Headers

Handover manager

Session

Delivery session

Transport

Transport layer

Network layer

Network and below

Delivery network

TS 102 232 part 01

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102 232 is the Future

❖ Fully supports VoIP and IP services

❖ Extensible

❖ Support for and compatibility with LTE & IMS

❖ Full IPv6 support

❖ Security options

❖ Rapidly replacing legacy and 671 based solutions

    ❖ Support IP encapsulation of Legacy services

    ❖ Part 6

❖ 20 years of ETSI heritage.

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3GPP SA3LI

❖ Sub-Working Group of SA3 Security Group
- ❖ Broadly operates independently.
- ❖ Group meets around 4 times a year
- ❖ Usually Europe and USA

❖ Focused on 2G, GPRS, 3G, LTE & Common IMS
- ❖ Develops complete stage 1,2,3 solutions.
- ❖ Lawful Interception only.

❖ Current Topics
- ❖ VoLTE, IMS WebRTC, Local breakout, H(e)NB / Femto cells, ProSe, IMS IMEI.

❖ Close co-operation with ETSI TC-LI and USA LI groups

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LI specifications in 3GPP

❖ *ETSI TS 133 106*   *(3GPP TS 33.106)*
Lawful interception requirements

    ❖ **provides basic interception requirements**

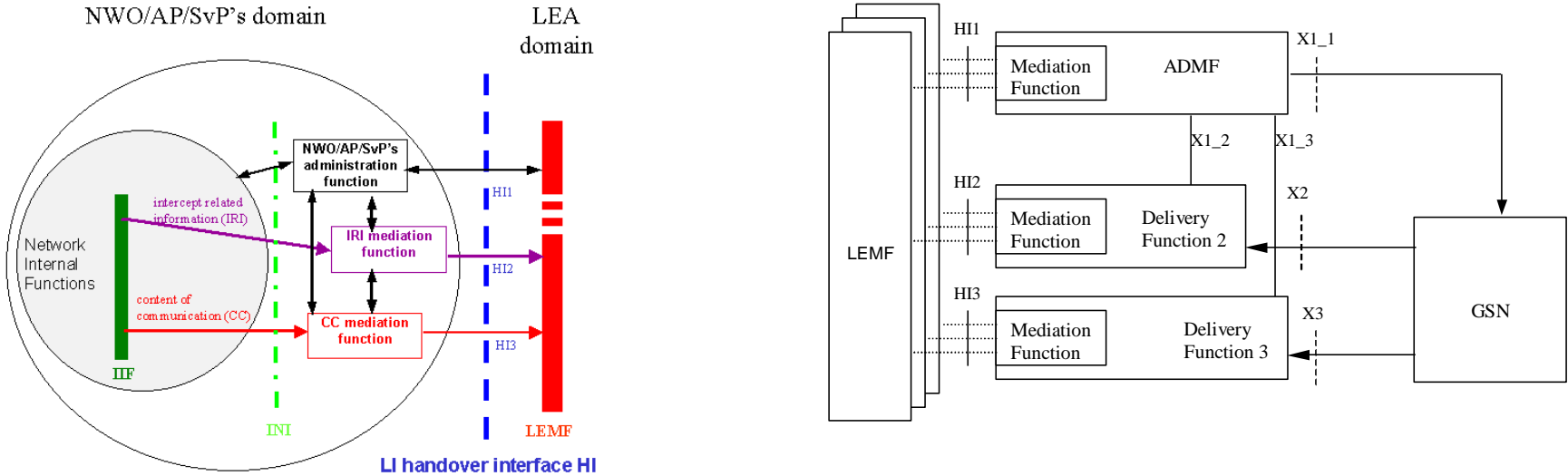   ❖ **partly based on ETSI TS 101 331**

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

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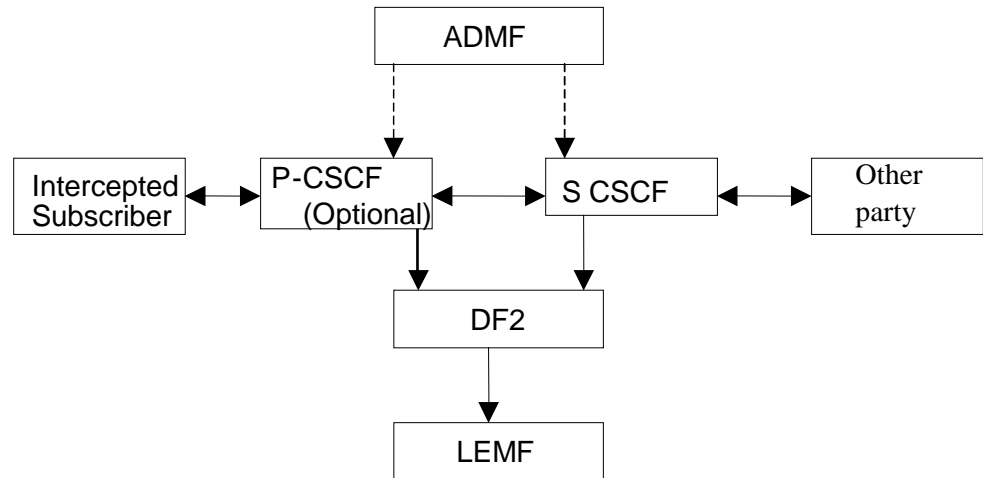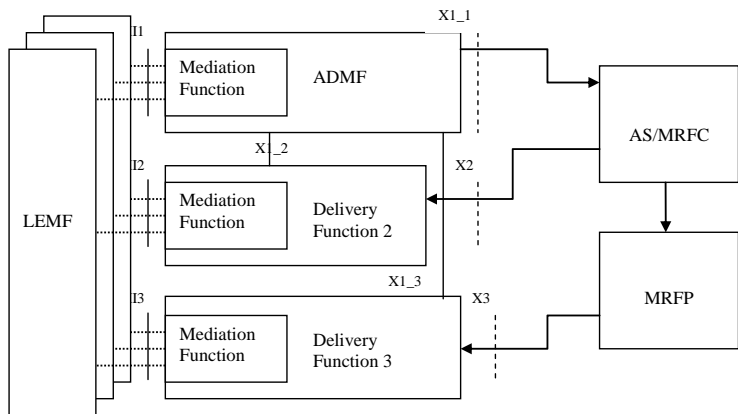**Handover interface for Lawful Interception**

❖ **Aligned with TC LI**

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Example SA3LI Reference Architectures

NWO/AP/SvP's domain

LEA domain

intercept related information (IRI)

content of communication (CC)

Network Internal Functions

IIF

NWO/AP/SvP's administration function

IRI mediation function
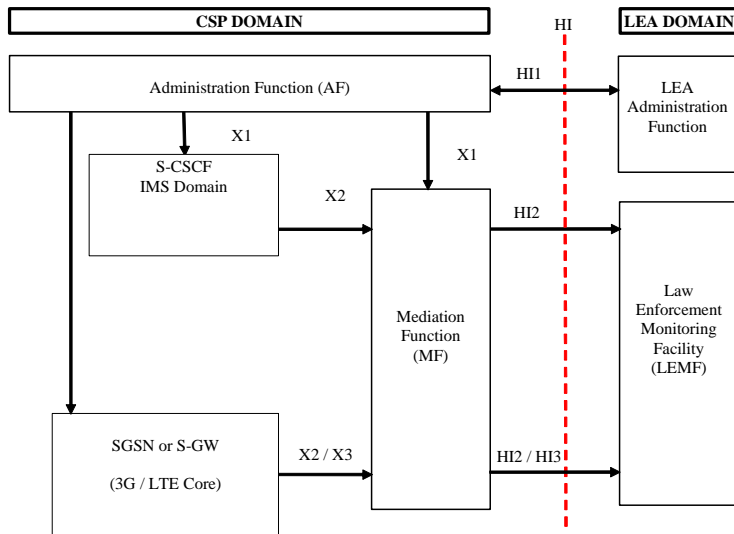
CC mediation function

INI

LEMF

HI1
HI2
HI3

LI handover interface HI

IIF: internal interception function
INI: internal network interface

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

LEMF — Mediation Function — ADMF — X1_1
Mediation Function — Delivery Function 2 — X2 — GSN
Mediation Function — Delivery Function 3 — X3

HI1, HI2, HI3
X1_2, X1_3

LEMF — Mediation Function — ADMF — X1_1 — AS/MRFC
I1, I2, I3
X1_2, X2
Mediation Function — Delivery Function 2
X1_3, X3
Mediation Function — Delivery Function 3 — MRFP

ADMF
Intercepted Subscriber — P-CSCF (Optional) — S CSCF — Other party
DF2
LEMF

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ETSI LI Security

CSP DOMAIN | HI | **LEA DOMAIN**

- Administration Function (AF)
- HI1
- LEA Administration Function
- X1
- S-CSCF IMS Domain
- X2
- X1
- Mediation Function (MF)
- HI2
- Law Enforcement Monitoring Facility (LEMF)
- SGSN or S-GW (3G / LTE Core)
- X2 / X3
- HI2 / HI3

- ❖ LI exists in separate security domain

- ❖ X interfaces isolate MF / AF from points of interception
  - ❖ X interfaces shall not be accessible from outside CSP environment.
- ❖
- ❖ New X1 interface
  - ❖ Mandatory security

- ❖ Standardised HI interfaces isolate LEA from CSP.

- ❖ Non-Detectability for non- LI personnel.

- ❖ AF and MF CSP controlled
  - ❖ Audit
  - ❖ Security of LI
  - ❖ Privacy

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Why DR implementation in the 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**

DR specifications in TC LI

❖ *ETSI TS 102 656*
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 traffic and subscriber data**
- ❖ **requirements to support the implementation of Directive 2006/24/EC**
- ❖ **freedom for national regulations, procedures and processes**

❖ *ETSI TS 102 657*
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 Data and in national legislations as defined in TS 102 656**
- ❖ **considers both the requesting of retained data and the delivery of the results**
- ❖ **defines an electronic interface (for the Request and for the Delivery)**

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Modular approach for DR spec.

Framework for Retained Data Handover Interface			
Telephony services	Network Access services	Asynchronous message services	Synchronous Multi-media services

e.g.

PSTN/ISDN
GSM/UMTS-cs
SMS/MMS

Internet
GPRS
UMTS-ps

E-mail
webmail

chat

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Next on DR

- ❖ **ETSI/TC LI will maintain the DR standards**
  - ❖ **Add new internet services as technology progress**
  - ❖ **Add new parameters in line with national requirements**
- ❖ **ETSI/TC LI can organise an interoperability test, if required**
  - ❖ **ETSI Plugtests for checking the specifications**
- ❖ **ETSI/TC LI is encouraging widespread use of the DR standards!**
  - ❖ **The use of the Handover standard is already promoted in international conferences and workshops**

- ❖ **ETSI/TC LI kept a close working relation with the EC/Experts Group "The Platform on Electronic Data Retention for the Investigation, Detection and Prosecution of Serious Crime"**
- ❖ **ETSI/TC LI keeps checking related activities in other groups to liaise, collaborate, avoid duplicate efforts...**

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Current & Future LI Challenges

❖ Encryption

❖ Service and User Mobility

❖ Correlation

❖ Volumes

❖ Privacy by Design

❖ Dynamic LI

❖ Cloud Computing

❖ Network Virtualisation

❖ Transnational Networks

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TC LI latest and future technical work

❖ Maintenance of LI and DR suites

❖ Ongoing new work
  ❖ Dynamic Triggering of LI function
  ❖ LI/DR for Cloud Computing
  ❖ handover interface for Warrant information
  ❖ X1 internal network interface
  ❖ Security for LI and DR systems
  ❖ Network Function Virtualization

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Keep in touch

- Many thanks

- Contacts
  - alex.leadbeater@bt.com   3GPP SA3-LI Chairman
  - gerald.mcquaid@vodafone.com   TC LI Chairman
  - carmine.rizzo@etsi.org   TC LI Technical Officer

Questions ?

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