

# 2<sup>nd</sup> Indo-European Dialogue on ICT Standards & Emerging Technologies

4th November 2015 • Shangri-La's - Eros Hotel, New Delhi, INDIA



## Lawful Interception

# The acronyms...

- 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.

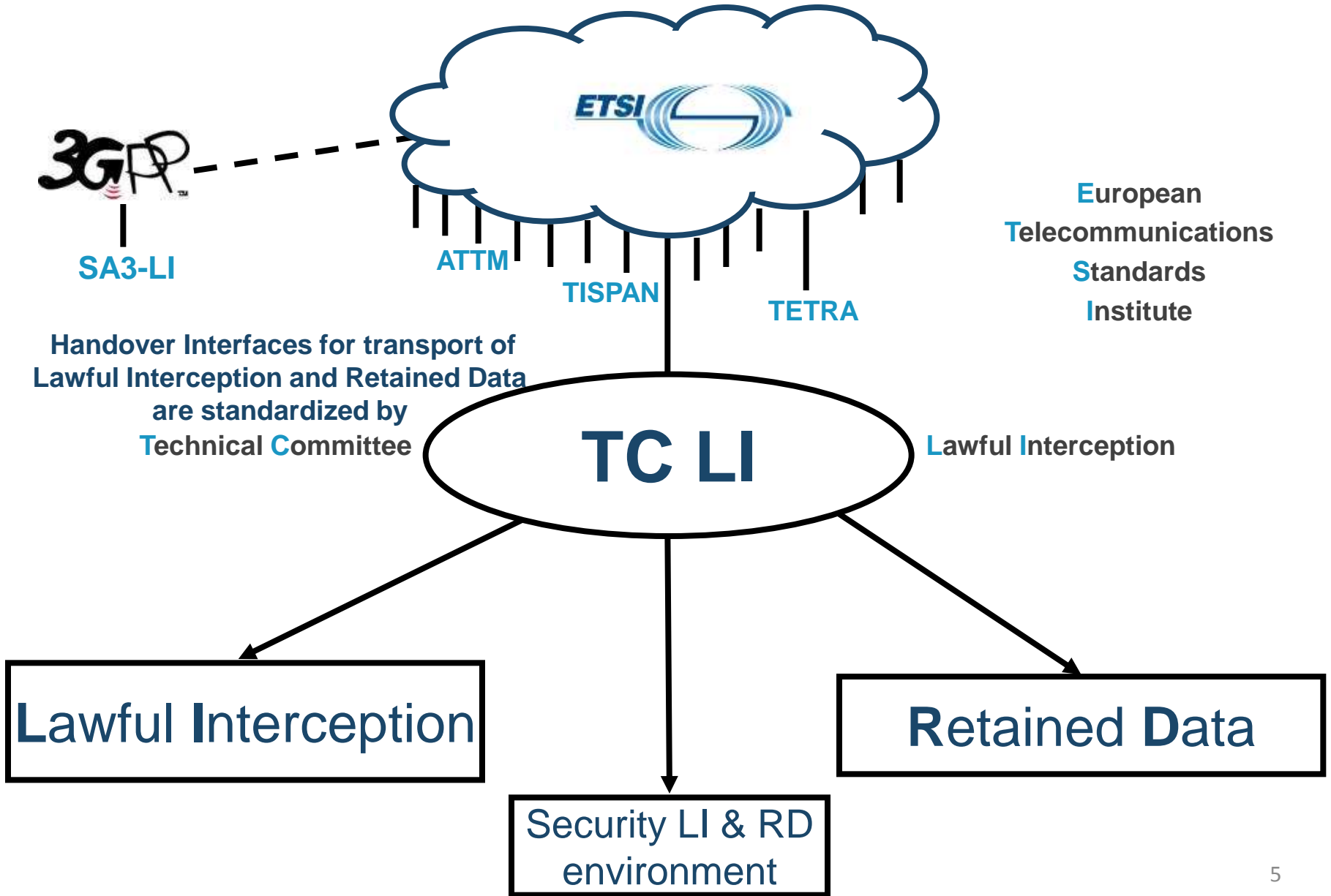
# TC LI – A Global Success

- 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.

# 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

# LI in ETSI



# 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

# TC LI relationships with other bodies

- **3GPP/SA3-LI** (LI for UMTS & GSM)
- **ETSI/TC CYBER** (Cyber Security aspects for LI/RD)
- **ETSI/ISG NFV** (LI for NFV)
- **ETSI/EP TETRA** (LI for Tetra system)
- **ETSI/TC NTECH (within EP E2NA)** (LI for fixed NGN & fixed IMS)
- **ETSI/TC CABLE** (LI for IPCableCom)
- **ETSI/TC SES** (LI for satellite systems)
- **ETSI/TC PLT** (LI for Powerline Communications)

# Current Standards

Type	Number	Title
SR	003 291	Guide to Lawful Interception and Retained Data standards and concepts
SR	003 292	LI; LTE Frequently Asked Questions and Implementation Guidance
TS	101 158	Telecommunications security; Lawful Interception (LI); Requirements for network functions
TS	101 331	Requirements of Law Enforcement Agencies
TR	101 567	Lawful Interception (LI) and Retained Data (RD); Cloud/Virtual Services
TS	101 671	Handover interface for the lawful interception of telecommunications traffic
TR	102 053	Notes on ISDN lawful interception functionality
TS	102 232-1	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery
TS	102 232-2	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 2: Service-specific details for messaging services
TS	102 232-3	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 3: Service-specific details for internet access services
TS	102 232-4	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 4: Service-specific details for Layer 2 services
TS	102 232-5	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 5: Service-specific details for IP Multimedia Services
TS	102 232-6	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 6: Service-specific details for PSTN/ISDN services
TS	102 232-7	Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 7: Service-specific details for Mobile Services
TR	102 503	ASN.1 Object Identifiers in Lawful Interception and Retained data handling Specifications
TR	102 519	Lawful Interception of public Wireless LAN Internet Access
TR	102 528	Interception domain Architecture for IP networks
TS	102 656	Retained Data; Requirements of Law Enforcement Agencies for handling Retained Data
TS	102 657	Retained data handling; Handover interface for the request and delivery of retained data
TR	102 661	Security framework in Lawful Interception and Retained Data environment
TS	102 677	Dynamic Triggering of Interception
TS	103 120	Interface for warrant information; Q&D LI Agnostic
TS	103 218	Lawful Interception and Retained Data Security
TS	103 221-1	Internal Network Interfaces for Lawful Interception
TS	103 280	Dictionary for common parameters
TR	103 657	Retained data handling; System Architecture and Internal Interfaces
TR	103 690	eWarrant Interface
TS	187 005	Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Lawful Interception; Stage 1 and Stage 2 definition
ES	201 158	Requirements for Network Functions
EG	201 781	Intelligent Network (IN); Lawful interception
EN	301 040	Terrestrial Trunked Radio (TETRA); Security; Lawful Interception (LI) interface
GS	NFV-SEC 004	Network Functions Virtualisation (NFV); Privacy and Regulation; Report on Lawful Interception Implications



# TC LI latest and future technical work

- Maintenance of LI and RD suites
  - LI and RD Handover Interface specifications
    - Handover from provider to authority
  - 7 parts: service-specific details for IP delivery
- Ongoing work on new documents
  - Specification (TS) on Dynamic Triggering of LI function
  - Two reports (TRs) on LI/RD for Cloud Computing
  - Specification (TS) on handover interface for Warrant information
  - Specification (TS) on X1 internal network interface
  - Specification (TS) on security for LI and RD systems
  - Specification (TS) on dictionary for common parameters
  - Special Report (SR) on LI/RD standards and concepts
  - Special Report (SR) on LTS FAQ and implementation guidance

# LI/RD work in other groups

- In ETSI TC CYBER
  - Report (TR) on security for LI and RD interfaces
  - Report (TR) on LI for NFV infrastructure
- In ETSI ISG NFV (Network Function Virtualisation)
  - Group Specification (GS) on LI implication in an NFV context

# 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**

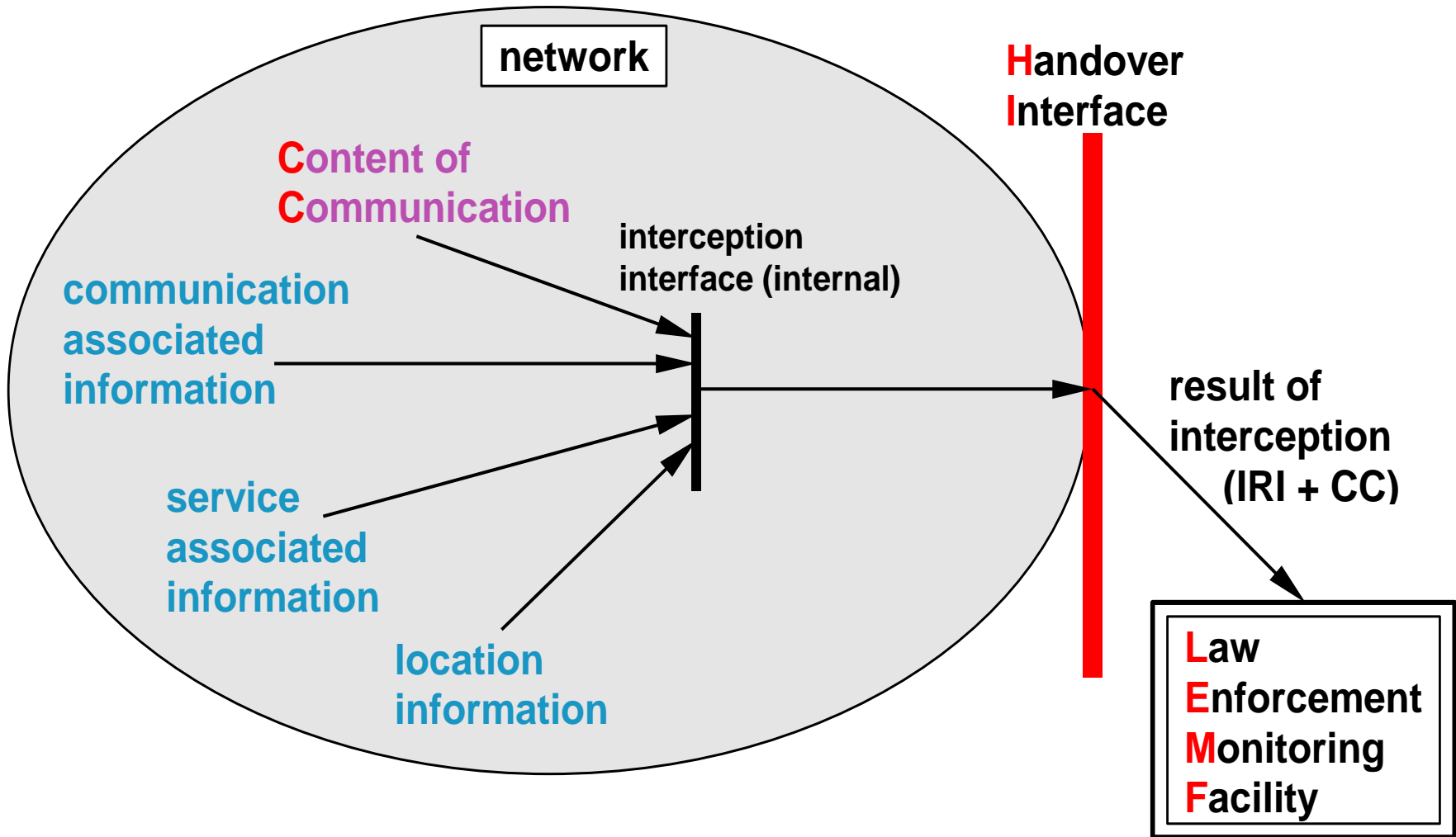
## Lawful Interception (LI) & Retained Data (RD)

- Delivery of intercepted data in transit (LI) and location (RD)
- Supports lawful investigations
- Defines Handover Interface from the Operator to the Authorised Organisation (typically a LEA)
- Maintenance of suites for LI and RD, new work and any technical details are added as needed

# 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

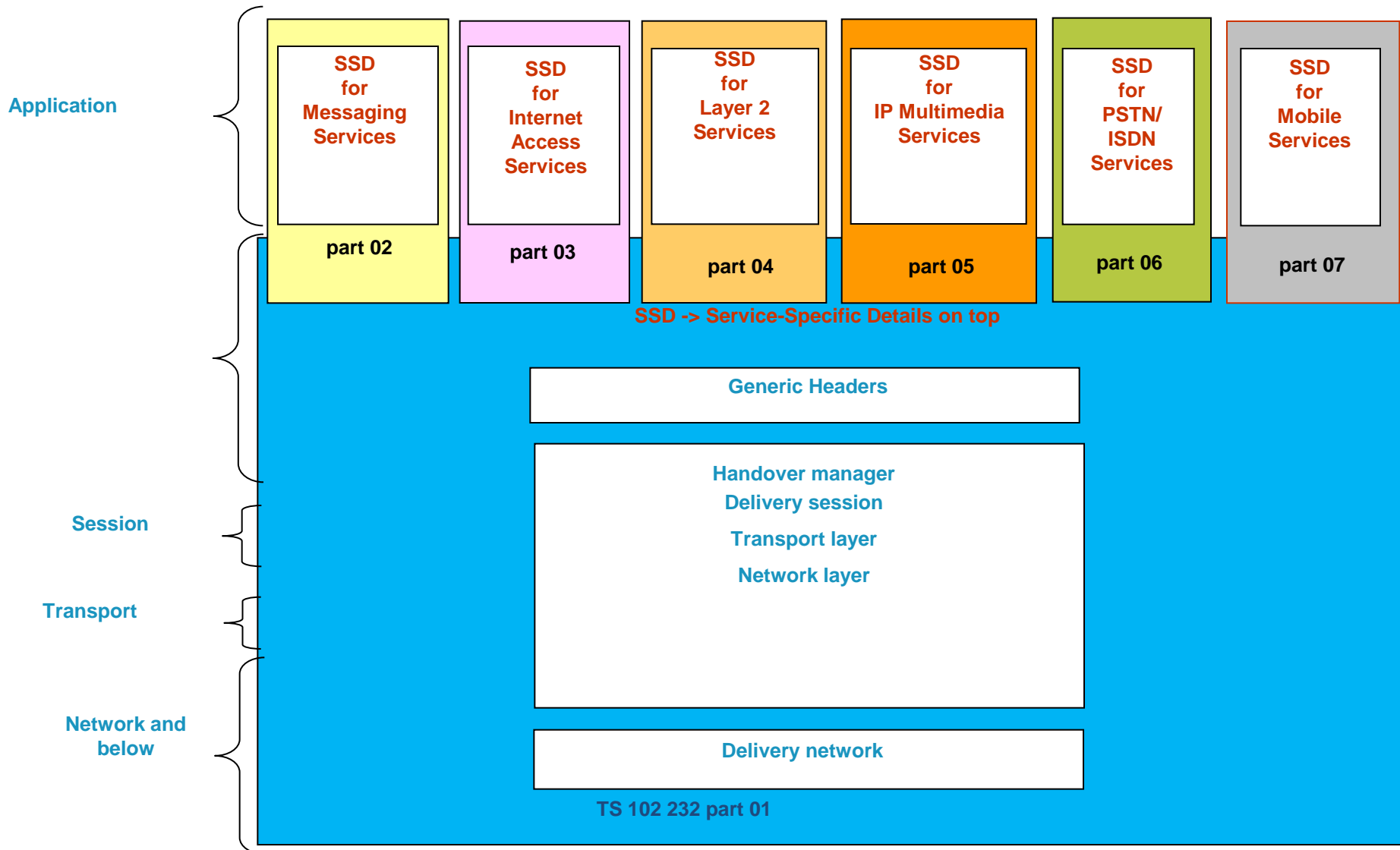
# General Network Arrangement



# 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

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





# RD 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**

**8 April 2014: The EC Data Retention Directive on was declared invalid by the European Court of Justice. Legacy of standardisation.**

*The requirement for ETSI deliverables on Retained Data remain regardless of the Directive  
ETSI deliverables have always referenced Retained Data even prior to the Directive.*

# Retained Data

## 🌐 *ETSI TS 102 656*

### Requirements of LEAs for handling Retained Data

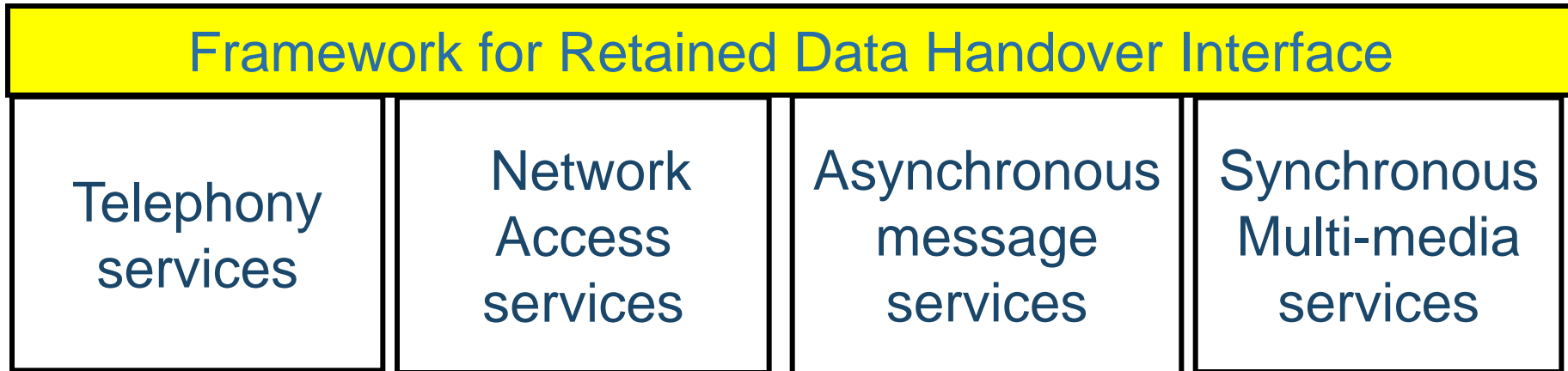
- guidance and requirements for the delivery and associated issues of retained data of telecommunications and subscribers
- set of requirements relating to handover interfaces for retained traffic and subscriber data
- requirements to support the implementation of Directive 2006/24/EC
- freedom for national 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)

# Modular approach for RD spec.



e.g.

PSTN/ISDN  
GSM/UMTS-cs  
SMS/MMS

Internet  
GPRS  
UMTS-ps

E-mail  
webmail

chat

# Next on RD

- ETSI/TC LI will maintain the RD 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 keeps encouraging widespread use of the RD standards.
  - **The use of the Handover standard is already promoted in international conferences and workshops**
- ETSI/TC LI maintains an observation of related activities and ongoing liaisons towards other groups to liaise, collaborate, and avoid duplicating efforts...

# Ongoing Work

## **"eWarrant"**

Significant work to date. Key intent is to establish a technical framework that can be adopted to any process or legal/regulatory landscape. Allows for electronic transfer of warrant information.

## **X1 Interface**

Standardising the command and control interface on the network infrastructure. Intended to reduce cost and increase security. This interface is under CSP control.

## **Small Cells**

Studying lawful interception requirements for small cells during local offload scenarios.

## **Mobile Edge Computing**

Ongoing review to ensure any impact on LI capability is managed.

## **NFV**

See later slide.

# More ongoing work.

<b>"Data Dictionary"</b>	Deriving a common set of parameters and definitions. Candidate inputs proposed. Approved at last meeting.
<b>Concepts of Interception in generic network architecture</b>	TR101943 Spring Cleaning during periodic review. To be replaced due to advances in technology..
<b>Cloud</b>	Outlining the impact of lawful interception and retained data requirements on cloud based services. Approved at last meeting.
<b>Security</b>	Document on security for LI and RD systems. Liaison out to TC Cyber on Digital Signatures. Requirement to ensure chain of custody of information can be proven in terms of security and integrity.
<b>Retained Data</b>	Not Data Retention !
<b>LTE</b>	LTE FAQ. Intended to close gaps in understanding by having a common ETCI TCLI/3GPP SA3 LI document.

# Even more ongoing work...

<b>Guide to LI and RD</b>	A guide for any casual or first time reviewer of standards to help them understand the standards and concepts, and include an evolutionary overview. LI 101.
<b>LEA Support Services</b>	Capture requirements e.g. location for life at risk scenarios.
<b>ISS</b>	Present ETSI TC LI in at least Europe but also further afield.
<b>EU</b>	Connection with Platform for Police Cooperation in Europe (looking after ex EU DRD) still maintained.

# Inter-Relationships

TC LI	SA3 LI	TC Cyber	Others
<ul style="list-style-type: none"><li>• Dynamic Triggering</li><li>• LTE FAQ</li><li>• NFV</li><li>• MEC</li><li>• Retained Data Security</li><li>• IAP Security</li></ul>	<ul style="list-style-type: none"><li>• Dynamic Triggering</li><li>• LTE FAQ</li><li>• NFV and MEC</li></ul>	<ul style="list-style-type: none"><li>• NFV platform</li><li>• Retained Data Security</li><li>• IAP Security (later)</li></ul>	<ul style="list-style-type: none"><li>• National Bodies</li><li>• GSMA</li><li>• ITU ??? No.</li></ul>



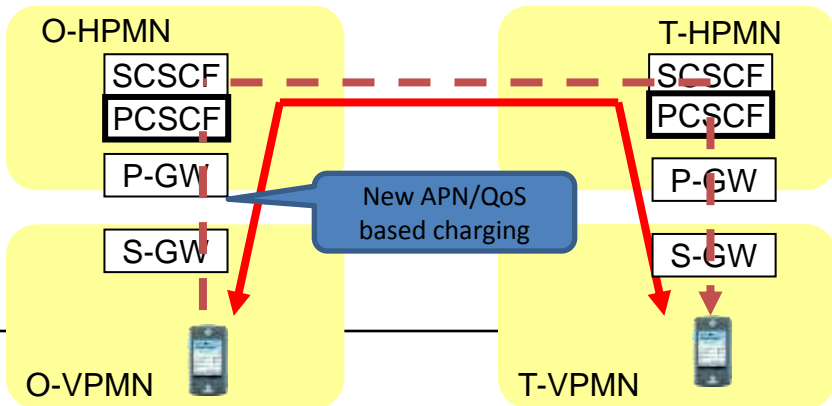
# Voice over LTE

## Current Status

- Confusion about the fact it's "over the top". Or is it ?!
- But it's not quite "over the top.." as it behaves like a POTS service and regulated.
- LTE FAQ designed to remove some of the options and derive a common way forward – de facto standard.
- Location. IMEI. Lots of joined up working with SA3 LI.
- GSMA – some interworking required e.g. RCS.
- We can't keep doing IP to TDM conversions. The LEMF must keep up.
- Push to centralise infrastructure. More probes, More encryption...Not the answer.
- S8 Home Routing.

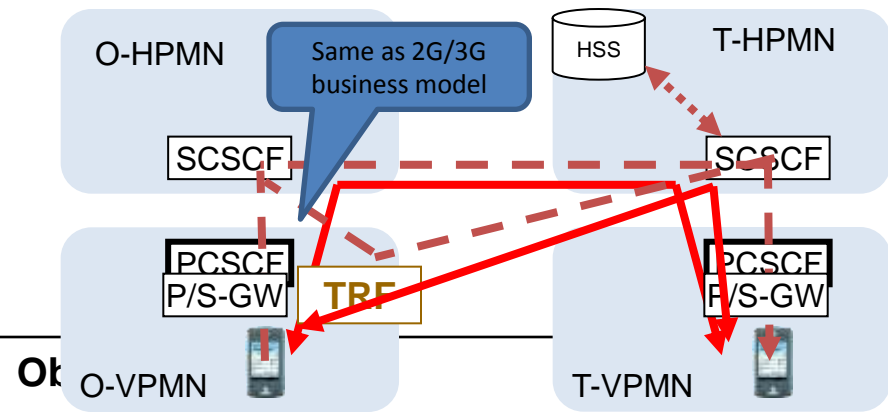
# LI for VoLTE Roaming Scenarios

## S8 Home Routing (S8HR)



- Encryption is under control of home network.
- Lack of service awareness prevents standard LI handover even if encryption is removed.
- Asking home network to perform LI on visited networks behalf is not an option. Neither is requesting the individual IPsec keys.

## Local Breakout (LBO)



Ok

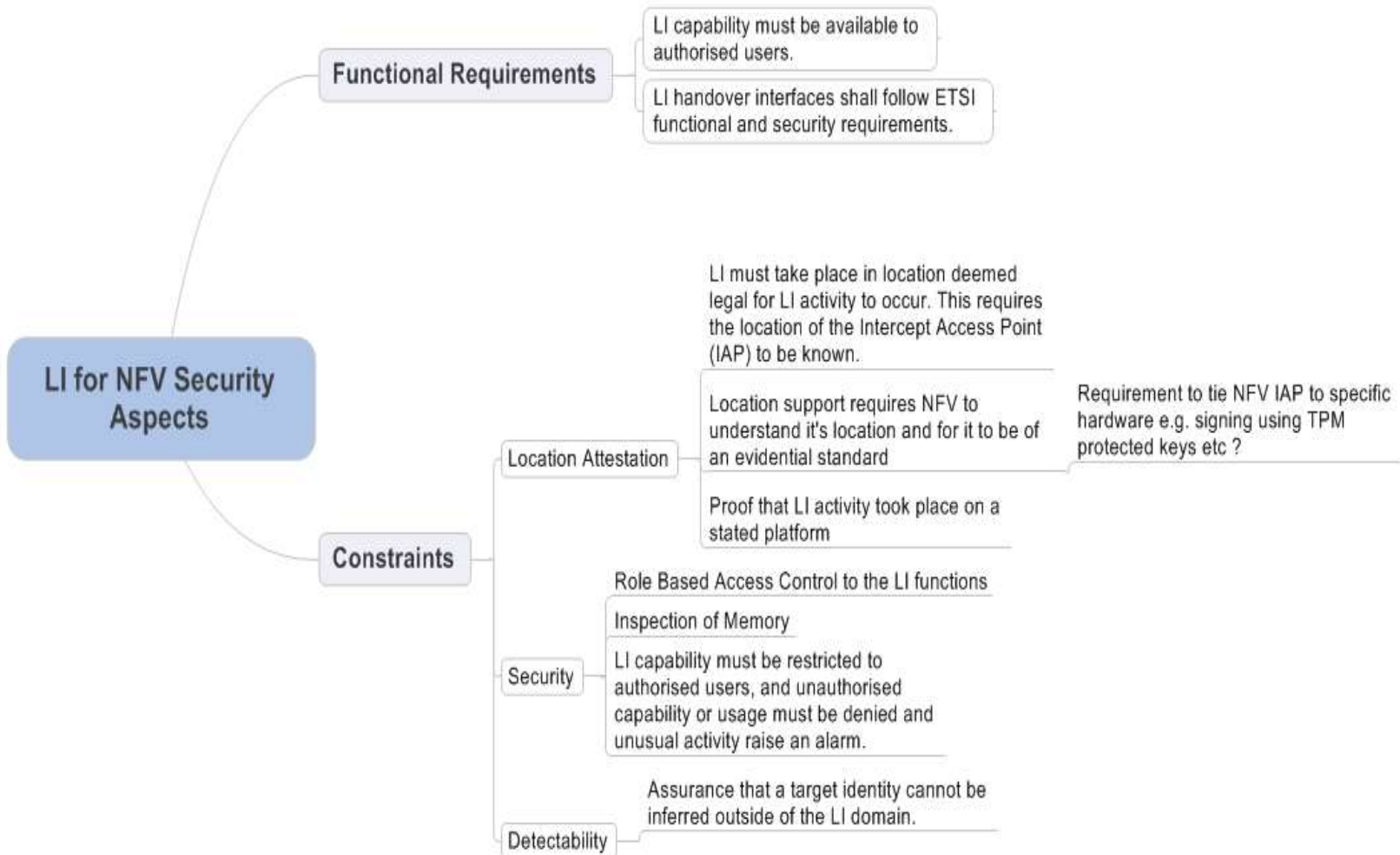
- Similar to “traditional” LI capabilities for 2G/3G.
- Careful study of use cases to be undertaken to ensure there are no missing data sets (there are some).
- Maintains existing business models.
- Further study on supplementary services required.

# ETSI NFV

## **A long story moving very quickly...**

- **NFV is being standardised (and in a race condition with vendors)**
- **NFV is already here. Some CSP's have been testing live for over a year.**
- **We can't trust the virtualised IAP if we don't trust the service platform.**
- **"We can't trust the service if we don't trust the underlying platform"**
- **Do we trust the platform ? The location ? The management ?**
- **TC LI and SA3 LI provided guidance to ISG NFV.**
- **NFV SEC working with TCLI, TC Cyber and SA3LI to manage requirements.**
- **Tension between securing properly, and getting a service working functionally.**
  
- **ETSI TR 103308 (A Security Baseline for NFV and related platforms) finalising via TC Cyber.**

# NFV



# Current & Future LI Challenges

- Encryption
- Service and User Mobility
- Correlation
- Volumes
- Privacy by Design
- Dynamic LI
- Cloud Computing
- Network Virtualisation
- Transnational Networks

## Contact details

- Gerald McQuaid – TC LI Chairman
- Carmine (Lino) Rizzo – TC CYBER Technical Officer [carmine.rizzo@etsi.org](mailto:carmine.rizzo@etsi.org)

