

# Lawful Interception

An introduction to ITU:  
ICT Trends and Challenges in a Global Era  
30 June 2008

Martin Adolph, ITU-T Research Officer  
[martin.adolph@itu.int](mailto:martin.adolph@itu.int)

The views expressed are those of the author and do not necessarily reflect those of the ITU or its Membership.



# Outline

- What is LI?
- LI in the history of telecommunications
- LI technology
  - What is intercepted?
  - How is intercepted?
- LI standards
  - ITU-T and LI
- Conclusion

# Def: Lawful Interception (LI)

- *Lawfully authorized* interception and monitoring of telecommunications pursuant to an order of a government body
- *Lawful?* Conducted in accordance with national law, following due process after receiving proper authorization from competent authorities

# What is lawful?



“The Lives of Others” (Oscar winner 2006)

**The New York Times**

**Lawyers for Guantánamo Inmates  
Accuse U.S. of Eavesdropping**

By [WILLIAM GLABERSON](#)

Published: May 7, 2008



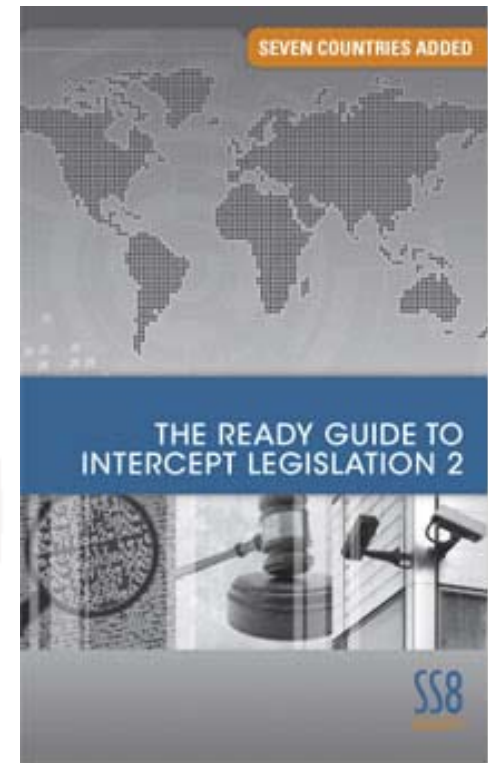
ECHELON interception network

etc.

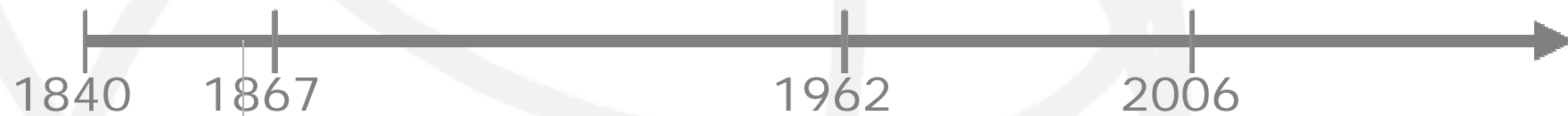


# What is lawful?

- 85 pages of legislation from 31 different countries: Australia; Austria; Argentina; Belgium; Brazil; Canada; Estonia; Finland; France; Germany; Hong Kong; India; Ireland; Israel; Italy; Japan; Republic of Korea; Lithuania; Malaysia; The Netherlands; New Zealand; Norway; The Philippines; Poland; Romania; Russia; Singapore; South Africa; Sweden; The United Kingdom; The USA.
- See <http://www.ss8.com/ready-guide.php>



# LI in the history of telecommunications



# LI in the history of telecommunications (2)



- Samuel Morse (1791-1872)
- First public message sent with electronic telegraph (circa 1840)
- Establishment of International Telegraph Union on 17 May 1865





# LI in the history of telecommunications (3)




- Interception and replacement of telegraph messages and stock data on their way from west coast to east coast (NYSE)
- Profit from plunging stock prices

1867



# LI in the history of telecommunications (4)


**NEW** 

**NOW**  
*Telephone*  
**SURVEILLANCE  
WORK MADE EASY**

- ★ Makes telephone recordings automatically
- ★ No Attendant necessary
- ★ Adaptable to most any recorder
- ★ Can be used near or great distances from parent telephone
- ★ Now being used successfully by police and law enforcement agencies nationally

An Electronic Transistorized control unit for automatically controlling the manual operating functions of any standard sound recording machine to record sound from telephone line. Unit will operate from any recording machine which has sufficient torque to start in record position. Will work satisfactorily on any national or foreign telephone single or multiple line system. Recorder runs only when telephone is in use. Automatically starts when telephone is answered or used for calling. Automatically stops when telephone call is completed. May be used on off premise extension as distant as five miles from parent phone by direct parallel connections. Can also be used to detect numbers called by the click method. Cannot be detected or heard by parent phone. Operates from self-contained power supply 115 volt A.C. 60 cycle.

DESIGN PATENT 30220601



See your Industrial Electronic Distributor or use the Readers Service card for catalogue and your nearest distributor.

Export Division: EMEC, Inc.  
127 Grace St. Plainview, L.I., N.Y.

**NET PRICE  
\$79<sup>95</sup>**

NOTE: Not intended for automatic telephone answering.

- Easy telephone surveillance magazine advertisement
- Interception system as a gadget for domestic use

1962

# LI in the history of telecommunications (5)



**The New York Times**  
**F.B.I. Gained Unauthorized Access to E-Mail**  
By [ERIC LICHTBLAU](#)  
Published: February 17, 2008

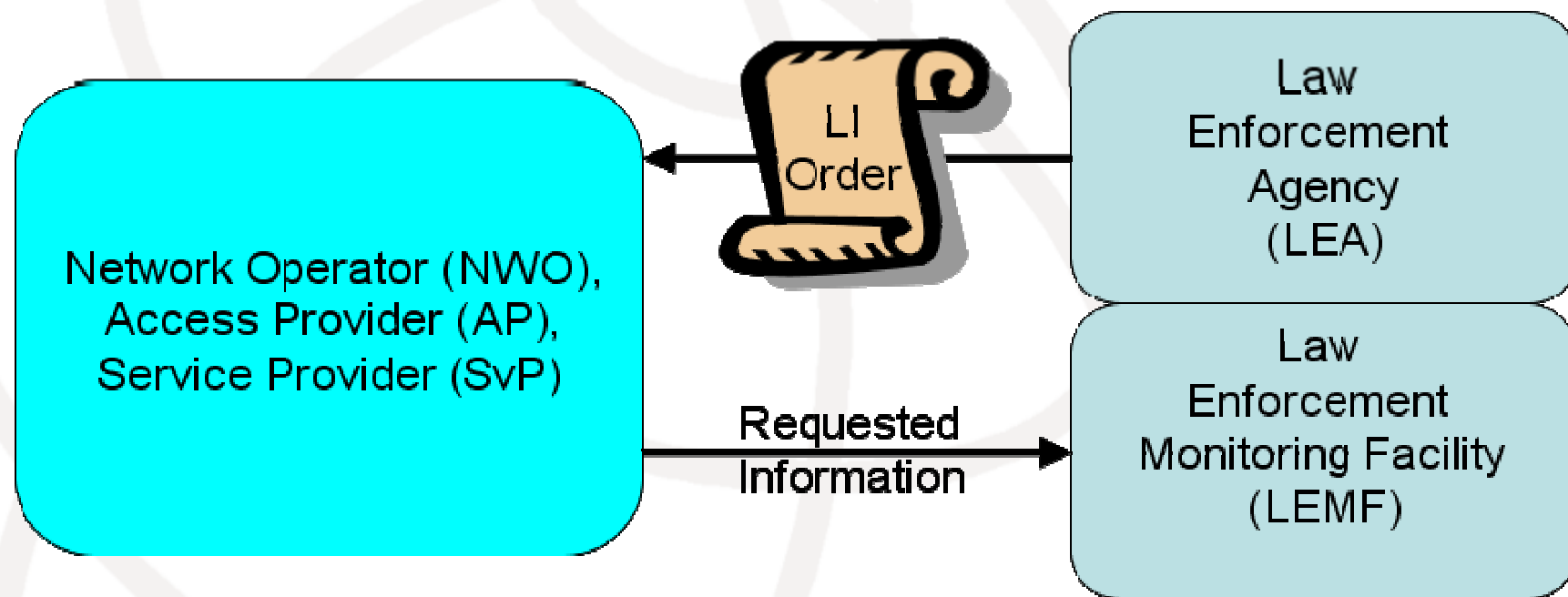
- 'Athens affair': mobile phones of 106 Vodafone Greece VIP customers, including PM, may have been routinely overheard and recorded
- 'miscommunication' between FBI and ISP – access to 100s of e-mail accounts instead of one approved by LEA

'04 '06

# What is intercepted?

- Depending on legislation, or LEA's order:
  - Contents of communications (CC)
    - Voice, video, text messages, e-mail content, etc.
  - Intercept related information (IRI)
    - Signalling information
    - Phone numbers, IP addresses, time, date, duration
    - Who communicated with whom, when, for how long, using which medium?
    - IRI have always been used by telcos for billing and network management

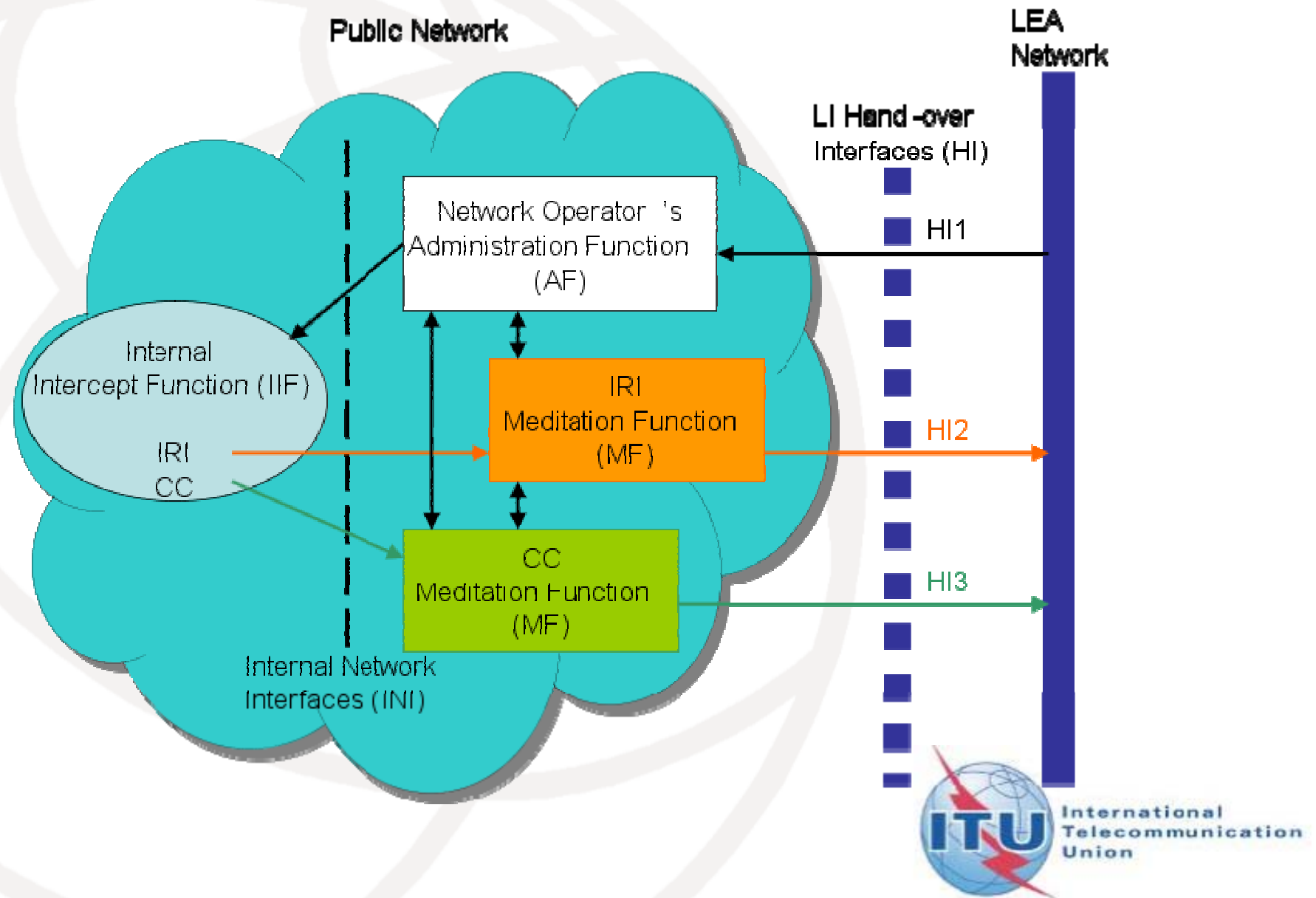
# LI process



## LI process (2)

- *Capture* - CC and IRI related to the subject are extracted from the network
- *Filtering* – information related to the subject that falls within the topic of the inquiry is separated from accidentally gathered information, and formatted to a pre-defined delivery format
- *Delivery* – requested information is delivered to the LEMF

# LI architecture (PSTN)



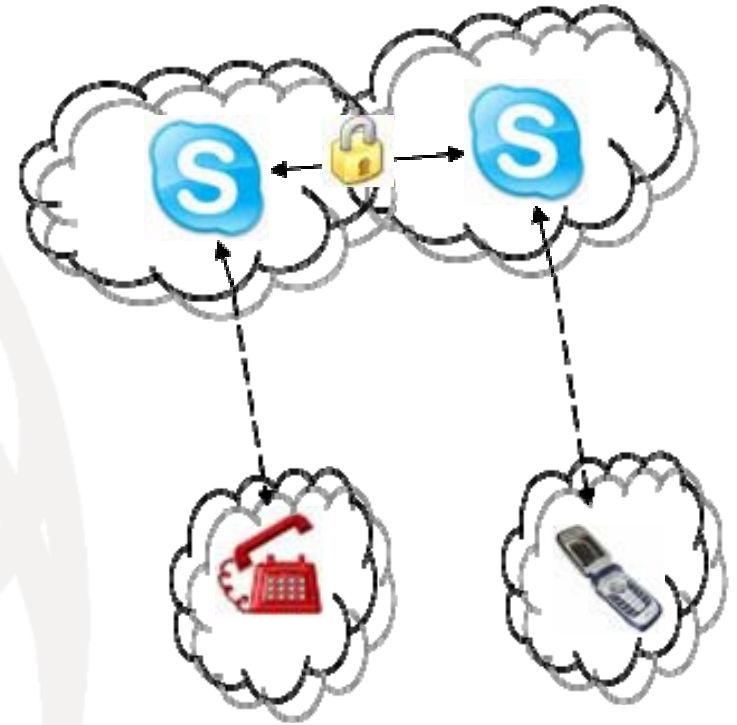


# LI architecture

- Interception by applying a (physical) 'tap' on strategic points, such as
  - Telephone lines
  - Digital switches
  - GSM base stations
  - Session border Controllers (SBC) in IP networks
  - etc

# LI in Skype?

- Skype reportedly uses non-proprietary, widely trusted encryption techniques:
  - RSA for negotiation
  - AES to encrypt conversations
- But who has access to the keys?
- Communication needs to be decrypted for 'SkypeOut'



# LI standards

- National LI laws require telcos, NSPs, etc to deploy interception systems that fulfil standards made by certain SDOs:
  - US CALEA (Communications Assistance for Law Enforcement Act)
    - Standards by CableLabs, ATIS, TIA
  - Many European countries
    - Standards by ETSI, national standards bodies
- See 'Ready Guide to Intercept Legislation'

# LI standards (2)

- ITU-T: Study Groups for all types of communications – LI could be agenda item in most SGs, such as
  - SG 9: LI in IPCablecom
  - SG 11: Signalling requirements for LI
  - SG 12: LI and Quality of Service (QoS)
  - SG 13: LI and cybersecurity
  - SG 16: LI in Multimedia systems
  - SG 17: LI and Identity Management (IDM)
  - SG 19: LI in Mobile telecommunication networks
  - Etc.
- But...

# LI standards (3)

- National matter vs. international matter
  - 'Grey area'
- Technical discussion of LI tends to get very quickly into parallel discussion of human rights, such as secrecy of communications
- Privacy and security must play a role in standards development
- LI treated with different priority and intensity

# Conclusion

- ICTs have permitted LI since the era of Morse's telegraph
- Number of (authorised) LI applications is growing (e.g. by 54% between 1996 and 2006 in the US – majority drug-related wiretaps)
- Standards are needed to assure transparent interception, focus on privacy and security



# Further reading

- ITU-T Technology Watch briefing report on LI:  
<http://www.itu.int/oth/T2301000006/en>
- SS8 Networks (LI provider): 'Ready Guide to Intercept Legislation'  
<http://www.ss8.com/ready-guide.php>
- IEEE Spectrum: 'The Athens Affair'  
<http://www.spectrum.ieee.org/print/5280>
- Privacy International,  
<http://www.privacyinternational.org/>
- History of ITU,  
<http://www.itu.int/net/about/history.aspx>

