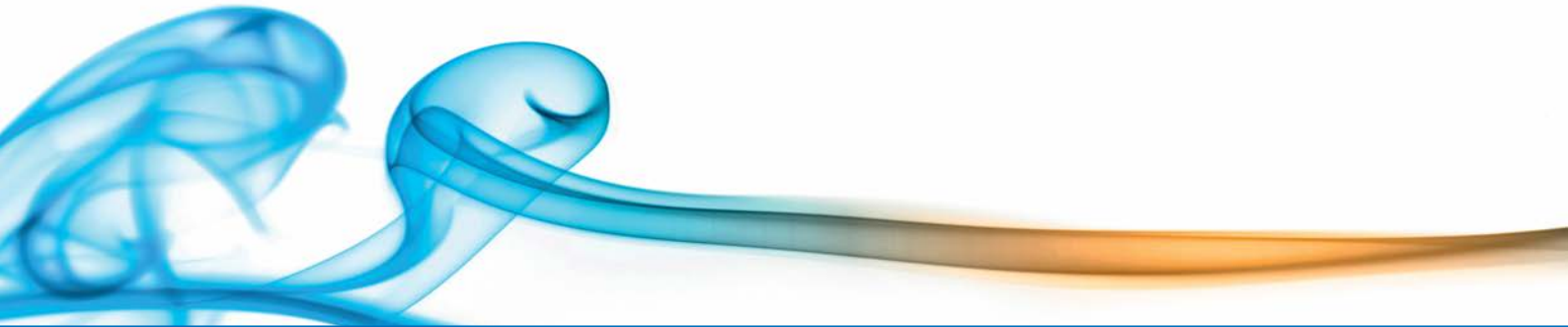


Utimaco LIMS™

Lawful Interception of Telecommunication Services





LIMS – worldwide

Lawful Interception

Lawful Interception (LI) is the legally approved surveillance of telecommunication services, and has become an important tool for law enforcement agencies (LEAs) around the world for investigating and prosecuting criminal activities and terrorism. Most countries have passed laws that require telecommunication service providers to support LEAs with duly authorized requests to identify, monitor, and deliver all of the electronic communications of specified individuals and groups. While regulations and requirements vary from country to country, international and US-American standardization bodies like ETSI or ANSI have developed technical standards for LI that will facilitate the work of LEAs and help operators and service providers to minimize their costs. Although various standards for LI use different terminology, the basic functional model shown in figure 1 applies to all LI standards and to all network and service types.

The main functions of any LI solution are to access Interception-Related Information (IRI) and Content of Communication (CC) from the telecommunications network and to deliver the information in a standardized format via the handover interface to one or more monitoring centers of law enforcement agencies. Of course, before surveillance can take place interception requests must be approved and appropriately provisioned to the Interception Access Points within the service provider's network, and they must be carefully and accurately terminated after the interception authorization expires. In addition, high security requirements for LI systems are essential to prevent possible manipulation and misuse.

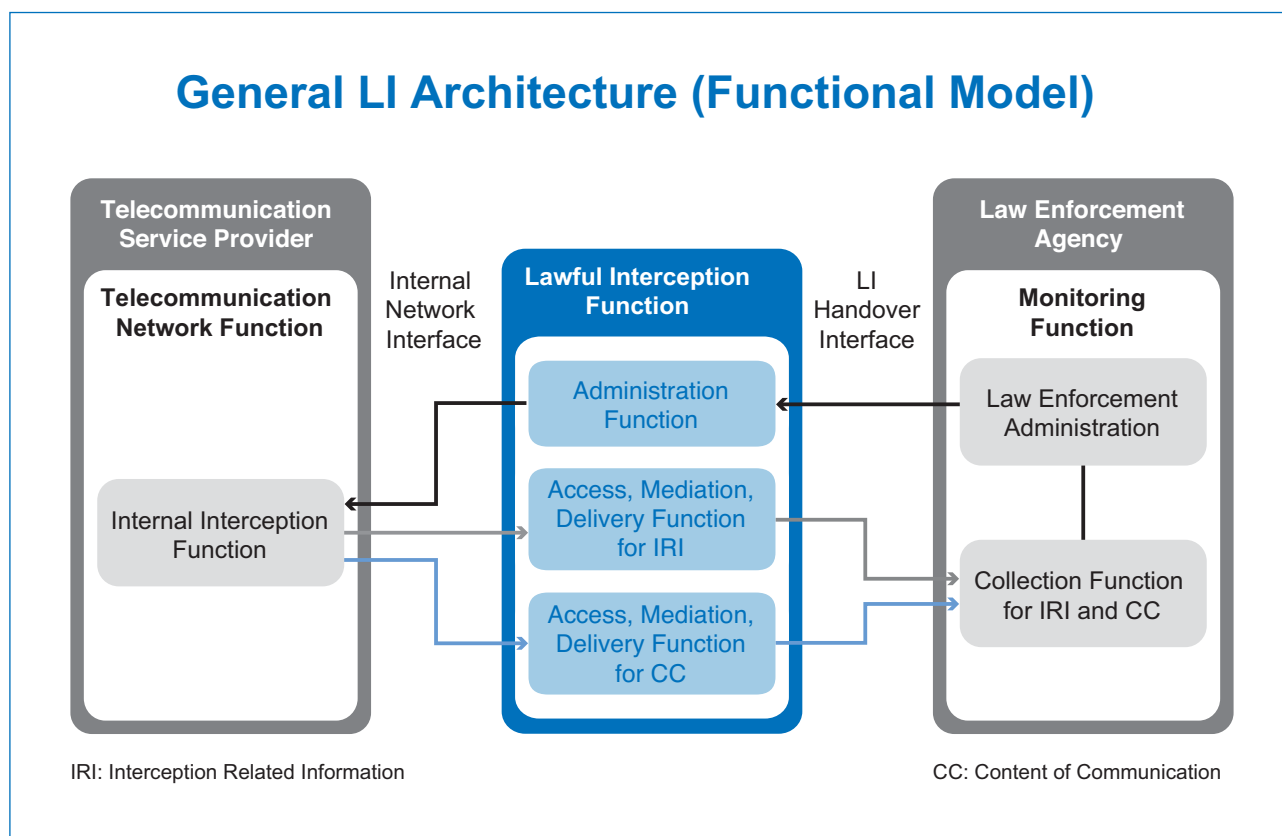


Figure 1. Functional model for lawful interception

Utimaco LIMS™ —

A Carrier-Grade LI Solution for Telecommunication Service Providers

Utimaco has been in the business of lawful interception since 1994 and has installed LI Management Systems in more than seventy countries around the world. As an active member of the ETSI LI group, Utimaco has participated in developing standards and in ETSI Plugtests¹. The Utimaco Lawful Interception Management System (LIMS) is a comprehensive solution that provides state-of-the-art surveillance capabilities for fixed and mobile communication networks and for various communication services, including traditional circuit-switched voice, next-generation packet-switched networks, 2G/3G mobile networks, and Internet-based services like e-mail and VoIP.

The LIMS solution usually acts as a bridge or mediator between the service provider's network and the LEA's monitoring centers.

The core competency of the Utimaco LI solution is its ability to interface with hundreds of different elements in a provider's heterogeneous network and to filter and deliver target-specific data to the LEA in a standardized format.

The LIMS modular architecture provides a future-proof path for operators to expand their LI capabilities throughout current and any future networks. The system can be configured as an entry-level single-server solution for thousands of subscribers and is scalable up to a multi-server cluster that enables monitoring in networks with millions of subscribers.

The Utimaco LIMS solution, as illustrated in figure 2, consists of the following components:

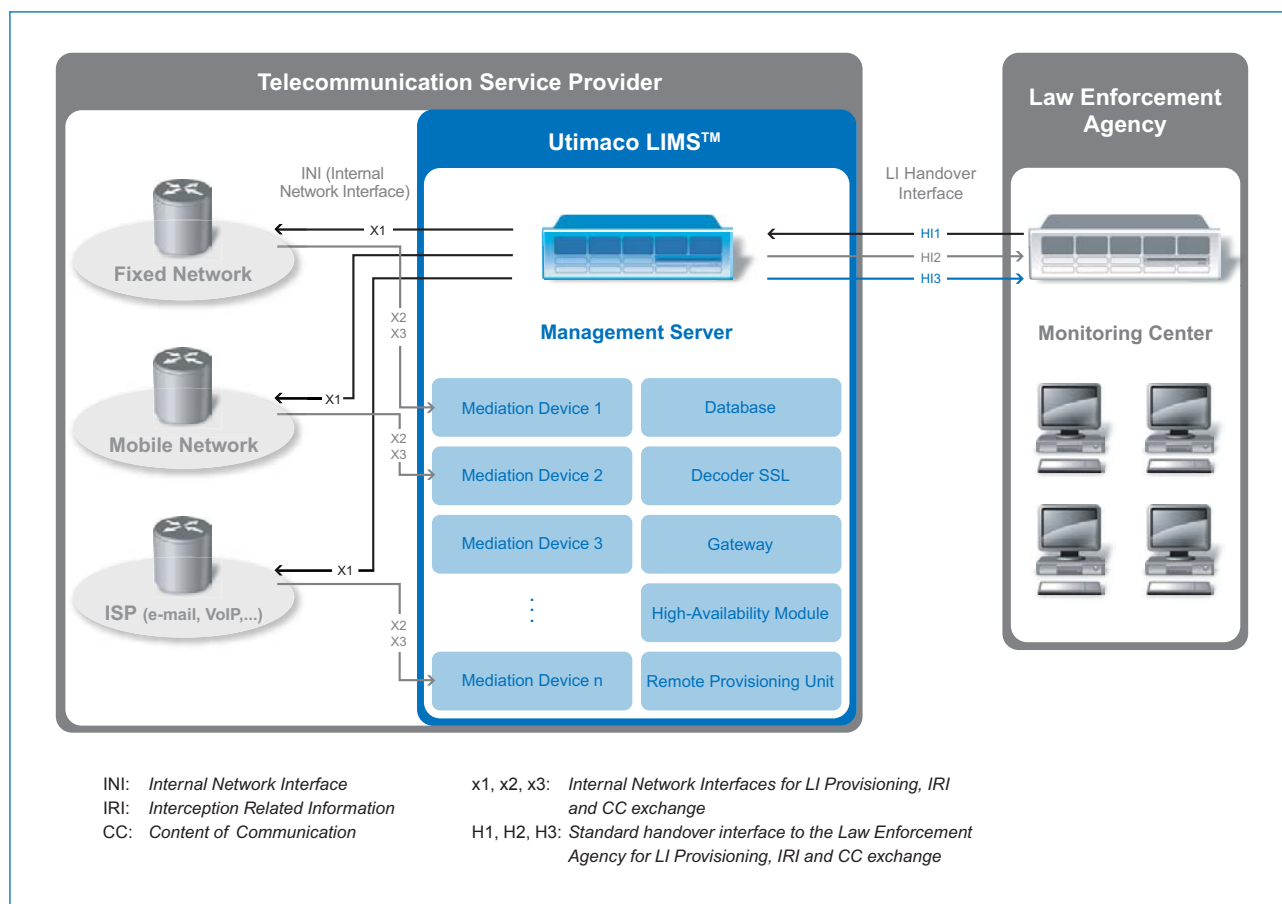


Figure 2. Architecture of the Utimaco LIMS

¹ Plugtests are interoperability tests organized by the European Telecommunications Standards Institute (ETSI). Plugtest™ is a trademark of ETSI.

LIMS Management Server

The Management Server, the core component of the LIMS system, incorporates the administration system for all system modules, the user interface, as well as security management for the whole system. The server maintains a central database of all intercept targets and authorized LEAs. Once an intercept target is entered into the Management Server, it is automatically provisioned to the appropriate interception access point in the network.

LIMS Mediation Devices

The LIMS Mediation Devices perform all tasks related to the delivery of intercepted communications to the authorized law enforcement agency. Mediation encompasses the conversion and mapping of interception data received from the internal network to the appropriate formats, protocols and interfaces as required by the LEAs. Also, Intercept Related Information sometimes needs to be stored intermediately in the Mediation Device before it can be forwarded to its final recipient.

Utimaco offers the industry's broadest list of mediation devices supporting a wide range of network technologies, services, protocols and standards. There are LIMS Mediation Devices for more than 200 different network elements of all major vendors. Delivery of intercepted data is compliant with various national regulations and national and international standards including CALEA, ATIS, ETSI and 3GPP standards.

LIMS Access Points

Depending on the network topology and capabilities, Utimaco recommends either active or passive approaches to intercepting communication data. In passive mode, network probes are integrated into the operator's network to filter, decode and forward intercept data to the LIMS, respectively to the appropriate Mediation Device. Utimaco has developed specialized network probes for deep-packet inspection of various communication services and application protocols such as e-mail, webmail, Internet access, instant messaging, Voice-over-IP and other IP-based services. Active interception, on the other hand, refers to the method of managing integrated interception capabilities of the available network elements, like switches or routers. In many real-world deployments a mixture of active and passive interception techniques provides the best results or is the only available option.



LIMS Decoder

The LIMS Decoder module can be used to enable LI in networks where the communication session is SSL/TLS encrypted between the user and the provider's servers. In e-mail environments, for instance, the LIMS Decoder is able to decrypt POP3S, SMTPS or IMAPS sessions before the e-mails can be monitored and filtered by the Interception Access Point.

LIMS Gateway

This modular media gateway handles the real-time conversion between packet-switched networks and circuit-switched networks. The LIMS Gateway is often needed in VoIP networks where the handover interface to the LEAs requires conversion of RTP media streams into TDM



(Time Division Multiplexing) signals. In addition to the media conversion, the LIMS Gateway can also act as a signaling gateway between SS7, ISDN and SIP. The product's modular hardware concept enables customized solutions for small networks, as well as for large networks supporting from 60 to 3,360 simultaneous calls.

LIMS Hardware

Utimaco LIMS runs on industry-standard servers by Oracle® with Oracle Solaris® operating system. Customers can choose from single-server configurations for small networks up to multi-server clusters for large networks with millions of subscribers and thousands of intercept targets. The LIMS Gateway is a highly modular blade system with eight slots for different CPU, DSP and line card modules.

LIMS High-Availability Option

The high-availability option for LIMS enables operators to build robust LI systems with 99,999% availability. The advanced Utimaco system monitoring software recognizes all kind of potential failures and bottlenecks and automatically switches system processes to hot-standby servers when necessary.

LIMS Remote Provisioning Unit

All administrative and operational functions of the LIMS Management System can be accessed remotely using the same graphical user interface as on the local management console. The LIMS Remote Provisioning Unit (RPU) ensures that the same security policies apply to both remote sessions and to local operation.

LIMS Loadbalancing Option

Utimaco LIMS is well prepared to scale with the ever increasing bandwidth requirements in modern telecom networks. Dynamic loadbalancing algorithms distribute intercepted data evenly among a range of mediation devices.



LIMS – worldwide

Utimaco LIMS™ —

Key Advantages

State-of-the-Art Interception System

After over 16 years of experience and continuous improvement, the Utimaco LIMS has matured from a surveillance system for mobile networks to a complete interception suite for various kinds of networks and services. Today Utimaco offers the industry's most comprehensive list of supported vendor network elements and enables lawful interception in virtually any wireless and wireline network supporting multiple services, including telephony, fax, SMS, MMS, Push-to-Talk, Internet access, e-mail, VoIP and other IP-based services. In its entire software and hardware architecture the Utimaco solution has been designed as a carrier-grade system that meets highest security, reliability and performance criteria. The Utimaco LIMS solution is approved by national regulatory bodies and is used by more than 150 operators worldwide.

Standards Compliance

Utimaco LIMS is designed to comply with national and international lawful interception standards developed by ETSI, 3GPP, ATIS and CableLabs. Utimaco shares its experience and expertise in standards with partners and customers to continuously optimize the solution and to meet specific requirements according to individual technical and legislative prerequisites.

Cost-Efficiency

The Utimaco LIMS is a centralized system that serves all LI-related tasks of multiple LEAs on a heterogeneous service network. By using one single point of access, operators can reduce their administration costs by simplifying the communication with LEAs and by reducing the effort for the provisioning of surveillance operations in the network. Operators can initiate, modify or delete any LI request on the entire network in a matter of minutes with the easy-to-use Utimaco LIMS graphical user interface. Once installed in the network, Utimaco LIMS is almost maintenance-free. Optional system upgrades, for example, for new services or new network equipment, can be provided cost-efficiently by Utimaco as part of a maintenance agreement or on an as-needed basis.

Security and Reliability

IT security has been Utimaco's core business since its foundation in 1983. As such, Utimaco thoroughly understands the security and privacy aspects of lawful interception and has implemented end-to-end security mechanisms throughout the entire LIMS system.

The data security features of LIMS™ include:

- ◆ Authentication and authorization by using a granular rights management system that enables accurate definition of administrative and operational tasks (role-based access control).
- ◆ Full audit trail with detailed accounting of all user and system events to avoid misuse and manipulation.
- ◆ Integrated alarm system to alert for system failures.
- ◆ Regular consistency checks to guarantee the data integrity in the target database and on the interception access points in the network.
- ◆ Encryption of internal and external data traffic.
- ◆ Encrypted storage of all sensitive data records, and complete removal of user data after expiration of the LI request.
- ◆ Transparent separation of different LEAs and LI requests, and isolated delivery of interception data to multiple LEAs.
- ◆ No back doors: The Utimaco LIMS never permits access to unauthorized users or by means other than those described in the documentation. The Utimaco LIMS security has been verified by official regulatory bodies, and interception results have been successfully approved by international courts as admissible evidence.

Modular and Scalable Architecture

While the system is designed for large-scale networks with millions of subscribers, the LIMS suite can easily be adapted to provide an economically feasible solution for networks with only a few thousand users. In fact, the modular software architecture enables operators to extend the system as the demand for lawful interception increases and/or their subscriber base grows. Performance-critical tasks and processes can be migrated to dedicated servers to increase the overall system capacity and throughput. The underlying hardware platform, based on Oracle® servers, provides the solid basis for a reliable, scalable system with sufficient performance reserves for all current and future network sizes.

The modular concept of LIMS further facilitates the integration of new network interfaces and protocols without requiring the reengineering of the complete system. There is virtually no limit to the number of active and passive Interception Access Points that can be connected and operated in parallel.

Managed LI Services

The LIMS role-based user management, together with its capability to serve multiple different networks and LEAs concurrently, allows various deployment models of the lawful interception system. Operators can either install and operate the LIMS system as part of their own Operations Support System (OSS), or they may decide to use the service of an independent LI service provider. Utimaco has selected and qualified a number of LI service providers who can effectively take over all administrative tasks related to LI and thus relieve the network operator of unprofitable duties and reduce the costs for maintaining and upgrading systems.

Global Service and Support

Utimaco understands that LI management is not simply about purchasing hardware and software – it's about implementing capabilities according to national legal requirements and technical prerequisites. Utimaco provides the services, support and resources that help you become compliant with these requirements while minimizing the costs and effort for installation and operation. With Utimaco's help, your staff can accomplish lawful interception while also keeping your service network tuned for maximum performance and utilization. Utimaco provides worldwide expert consulting services, 24x7 technical assistance, online support, onsite training and installation services.



Five Reasons to Select Utimaco LIMS™

Experience

Utimaco develops high security solutions for corporate and public applications and was one of the first companies worldwide to deploy lawful interception solutions for mobile networks. In the past sixteen years Utimaco has gained extensive experience in the LI market and has installed LI systems in more than sixty countries around the world.

Expertise

Utimaco is an active member of several national and international standardization groups and maintains contacts with regulatory bodies and LI experts worldwide. In all matters relating to lawful interception, Utimaco is the preferred partner of many of the leading telecom suppliers and monitoring center vendors. The LIMS solution continues to be developed and maintained by a team of experienced engineers who have worked in the LI field for many years.

Compliance

The LIMS solutions comply with a large number of international LI standards and requirements. Compatibility with network equipment vendors and monitoring center suppliers is an important benefit of the solution, and Utimaco verifies this compatibility on an ongoing basis.

Cost-efficiency

The modular architecture of Utimaco LIMS enables cost-effective and customized solutions for LI projects of all sizes. The central administration of intercepts and the high level of automation speeds up the process of managing court orders, simplifies the cooperation with LEAs, thus leading to countable opex reduction.

Reliability

Utimaco is a recognized player and financially stable public company in the worldwide IT security industry. In addition to our technical experience in lawful interception, we pay very close attention to the legal aspects of lawful interception and regard this as an important factor in our business. As a result, the Utimaco LIMS system strictly conforms to the appropriate laws and regulations. Furthermore, the system includes numerous security measures to prevent misuse by unauthorized persons.



LIMS – worldwide

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Feature Overview

LI Standards

- ◆ ETSI TS 101 671 (voice), TS 101 331 (generic), ES 201 158 (generic), TS 102 232-1 to 102 232-6 (IP, E-Mail, VoIP)
- ◆ ANSI/ATIS: J-STD-025-B (Voice, CDMA), T1.678v2 (VoIP), T1.IPNA (Internet, T1.IAS), T1.724 (UMTS), TIA-1072 (PoC)
- ◆ 3GPP: TS 33.106, TS 33.107, TS 33.108 (UMTS)
- ◆ PacketCable v1.5 (Cable)

Supported Services

- ◆ VoIP (SIP, H.323, SCCP, RTP)
- ◆ GSM, GPRS, UMTS, LTE
- ◆ CDMA, CDMA2000
- ◆ SMS, MMS, Voicemail
- ◆ Push-to-Talk over Cellular (PoC)
- ◆ PSTN (Fixed Telephony)
- ◆ Broadband Access (DSL, Cable, WLAN, WiMAX)
- ◆ E-mail (POP3, SMTP, IMAP, webmail)
- ◆ other IP-based services

Performance

- ◆ Max. number of subscribers: scalable from 1,000 up to millions of subscribers (virtually unlimited)
- ◆ Max. number of targets: scalable up to thousands of concurrent LI requests
- ◆ Probe Performance: up to 10 Gbps (2,000,000 pps) and 25,000 targets per LIMS Access Point

Vendor Interfaces

- ◆ Acme Packet, Alcatel-Lucent, Arris, Bridgewater, Broadsoft, Casa, Cisco, Comverse, Ericsson, Huawei, Iptego, Italtel, Juniper, Motorola, Nokia-Siemens-Networks, Nortel, Oracle-Sun, Redback, Unisys, Sitronics, Sonus, Starent Networks, Thomson-Cirpack, Vocaltec, ZTE and others

Network Interfaces

- ◆ 1Gb - 10Gb Ethernet, X.25, ISDN, E1/T1, SDH/Sonet, ATM, SS7 interfaces

Security

- ◆ Role-Based Access Control
- ◆ Detailed accounting (full logging)
- ◆ IPsec/SSL/TLS encryption
- ◆ Encrypted storage, encrypted backup
- ◆ System monitoring and alarms
- ◆ System redundancy
- ◆ Disaster recovery system
- ◆ Secure remote access

Other features

- ◆ Integrated accounting and billing functions
- ◆ Dynamic load-balancing
- ◆ Easy-to-use graphical user interface
- ◆ Remote management of other LI systems
- ◆ Multi-tenant support



LIMS – worldwide



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