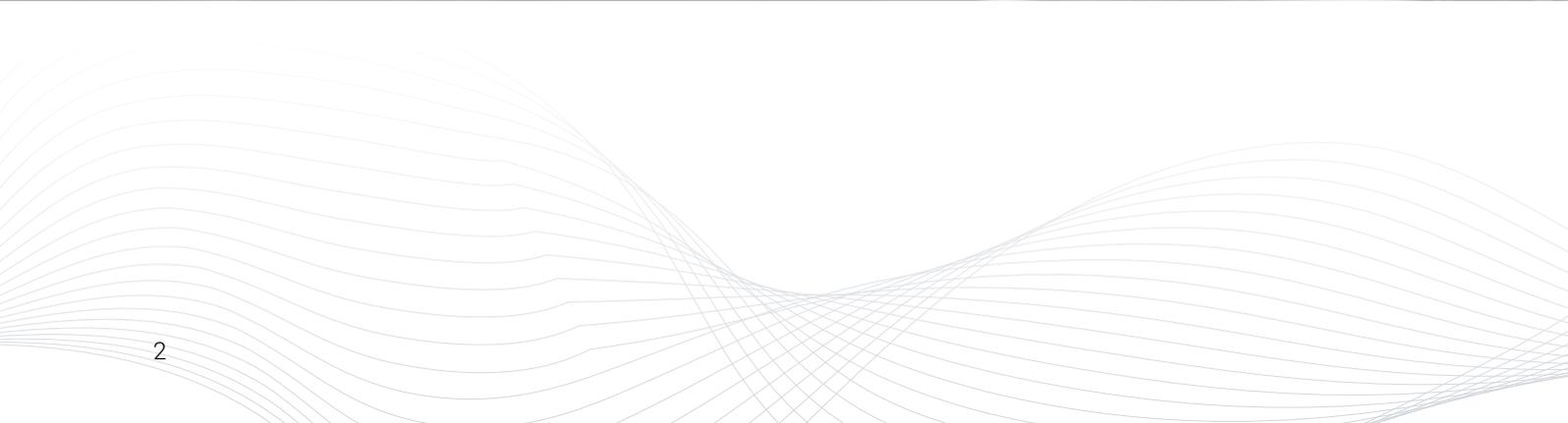
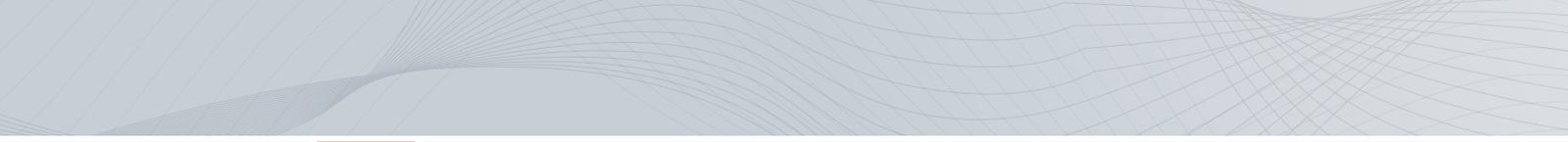




DRS

DATA RETENTION SUITE
CARRIER-GRADE TELECOM DATA RETENTION

utimaco[®]



Data Retention

Data Retention has become a buzzword in intense debates between data protectors and law makers over the last few years. It refers to the process of storing communication records and subscriber data for various telecommunication services for a period of several months and years. Law enforcement agencies and intelligence services regard the access to retained telecom data as an important pillar of criminal investigation and the prevention of terrorism. The common objective is to use the data to identify and trace suspects, uncover social networks among terrorists, or to collect admissible evidence for court proceedings.

Many countries around the world have passed laws that stipulate the authority of police and intelligence agencies and the responsibility of service providers. Typically telecom operators and Internet service providers are requested to retain call records, Internet connection records, E-Mail logs and subscriber data for a period between six to twenty-four months. They have to respond to authorized inquiries by law enforcement agencies without undue delay and report the retained data of a suspect.

For telecom operators and ISPs this means they need to make an additional investment in support systems that enable them to comply with these data retention laws. Clearly, it is not sufficient to simply extend the retention period of billing records as the laws and regulations require additional details and demand strongest data protection. Depending on the size and type of operator there are millions to billions of records to be retained every day and operators must be prepared to respond to hundreds to thousands of inquiries per day.

Utimaco has addressed these needs and challenges with the introduction of a purpose-built solution for telecom data retention: the Utimaco DRS. This system is based on the experience and technology of our world-leading lawful interception system, the Utimaco LIMS, which is deployed among telecom operators in more than 90 countries around the world.

Challenges for Operators

Store millions to billions of records per day of data generated at various sources in the network

1

Handle hundreds to thousands of inquiries by law enforcement agencies per day

2

Respond to authorized requests without undue delay

3

Maintain high security to protect sensitive subscriber data and details about the inquiries

4

Be prepared for network evolution and service changes

5

Utimaco DRS

A carrier-grade data retention solution

The Utimaco DRS (Data Retention Suite) has been designed as a carrier-grade system to enable fast and secure access to retained data by authorized agencies. It enables network operators and Internet service providers to easily comply with recent telecom regulations for data retention.

System architecture

The Data Retention Suite consists of a set of software modules that run on Dell® OEM servers with Red Hat® Enterprise Linux. The frontend component, the DRS Management Server, enables user-friendly access to all administrator and operator functions via a secured web

application. It also provides electronic interfaces to law enforcement agencies via fax, E-Mail, or IP interfaces (ETSI RDHI). The backend components of the Utimaco DRS include the DRS Backend Server, one or many DRS Collection Devices, and a powerful data warehouse optimized for rapid search and big data analysis. The DRS Backend Server is the core of the entire system as it implements the business logic encapsulated in a well protected server. The DRS Collection Devices provide the service- and vendor-specific interfaces to the various network nodes that generate CDR records and keep communications data and subscriber data.

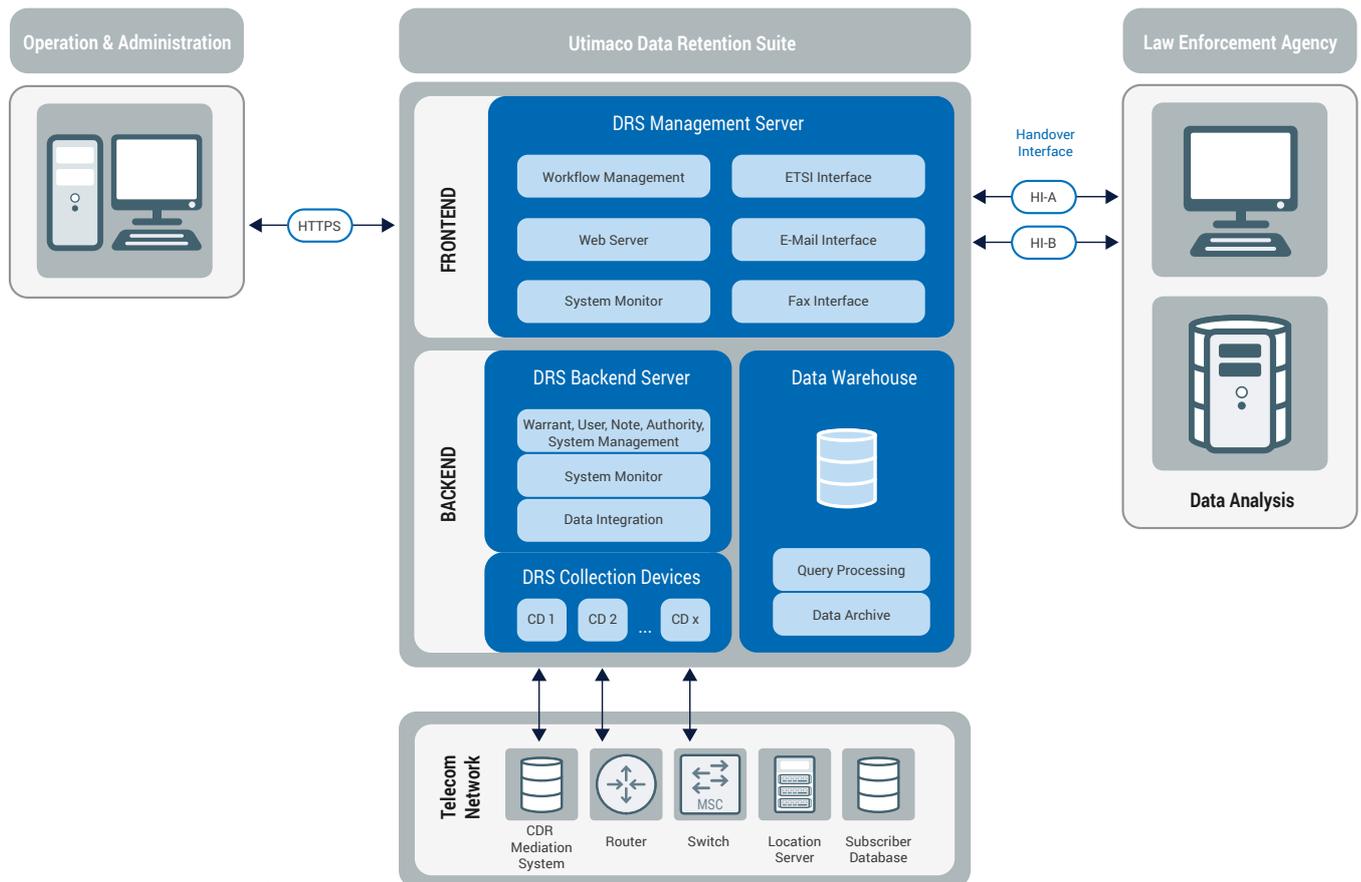


Figure 2:
Architecture of the Utimaco
LIMS

Key features

- Collects communications data (CDR, IPDR) and subscriber data from any telecommunications network
- Retains large amounts of data in a powerful and secure data warehouse
- Provides very fast search and analytics in billions of data records
- Automates request processing and reports search results over secured interfaces

The Utimaco DRS addresses all aspects of telecom data retention and has been designed to provide the following benefits to network operators, service providers, and law enforcement agencies:

Benefits

Cost-efficiency

- The Utimaco DRS minimizes operational costs by automating warrant management and electronic delivery of search results.
- Broadly-available servers deliver optimal price-performance ratio for telecom operators of any size.
- Multi-tenancy support reduces capital expenses for multi-provider and multi-country networks and enables outsourced business models.
- The state-of-the-art data warehouse architecture compresses all retained data and thus minimizes storage costs and enhances search performance.
- One-stop shopping – Utimaco delivers a full turn-key solution with all required hardware, software and services.
- The Utimaco DRS has been designed for seamless integration into existing networks, making use of available CDR mediation systems and customer databases.

Compliance

- The Utimaco DRS is a purpose-built solution that reduces the risk of non-compliance to data retention obligations.
- Highest security standards guarantee data protection and prevent misuse by unauthorized persons.
- Automated workflows help operators balance between data protection laws and obligations to disclose sensitive data to authorized agencies.

- The Utimaco DRS enables operators to handle thousands of requests per day and is fully compliant with the latest ETSI standards for retained data.

Reliability

- The Utimaco DRS is a future-proof investment that is continuously being improved in accordance with the latest regulatory requirements.
- The modular architecture of the Utimaco DRS's solution facilitates technology changes in the telecom network at predictable costs.
- The Utimaco DRS enables full retention of telephony, E-Mail, Internet access, and subscriber data and can be extended for other communication services or by data from other sources, such as financial transaction systems or toll systems.
- Server redundancy, RAID storage, and process monitoring are integral concepts to maximize service availability and to prevent data loss.
- The Utimaco DRS can scale with data volumes from a few million to billions of data records and customers can easily extend their installation as capacity and performance needs grow.
- Utimaco has over 20 years of experience in lawful interception and has proven technologies that have been developed for the Utimaco Lawful Interception Management System.

Seamless System Integration

Rather than replacing existing equipment, the Utimaco DRS has been optimized for seamless integration into existing OSS/BSS infrastructures, thereby reducing total cost of ownership. The solution supports different methods and data formats to extract, transform and load data from the various sources in the network.

Import to the data warehouse

Data generated by networks nodes can be loaded into the Utimaco DRS internal data warehouse at a very high speed. The system simultaneously supports multiple data sources for telephone calls, messages, E-Mail and Internet connection logs. Other services can be added on request.

During the data acquisition process all data are filtered, integrated, and normalized to a uniform data format before they are stored in the encrypted database. The organization of the data in the DRS data warehouse differs significantly from common relational databases. DRS arranges the data by column rather than by line, which in effect means that all tables are automatically indexed, but without the overhead (storage, management and tuning) that is associated with traditional approaches to indexing. Columnar storage also means that much more effective

compression algorithms can be applied to the data so that storage requirements are reduced even further. As a result of these and other features, query performance will on average improve by several orders of magnitude when compared to row-based database solutions.

The purpose-built data organization in the Utimaco DRS further removes the need for a multi-tier archive with different partitions for fast access and long-term storage. With the DRS all data records can be kept in one archive while providing average query times of just a few seconds even for complex searches in billions of records.

Online access to databases

When certain data to be retained are already available in databases or in information systems of the network operator, and can be accessed via common application interfaces, these data do not necessarily need to be copied into the DRS data warehouse. Instead the system can be configured for online access at query time. This approach avoids redundant data keeping and reduces costs. Law enforcement agencies can connect to Utimaco DRS systems in various ways depending on the technical capabilities and configurations and on national regulations.



There are various options for the exchange of data requests and reports, from files, E-Mail to automated hand-over interfaces, such as the ETSI Retained Data Handover Interface (RDHI).

executes the search requests on behalf of an authorized law enforcement agency, or, alternatively it can be installed at a trusted third party with direct IP connections to the data sources.

The Utimaco DRS system can be flexibly configured for different deployment options and business models. It can be installed and operated by a service provider who

One DRS management system can administer and segregate many different networks to enable managed service models, support MVNOs, and national DR solutions.

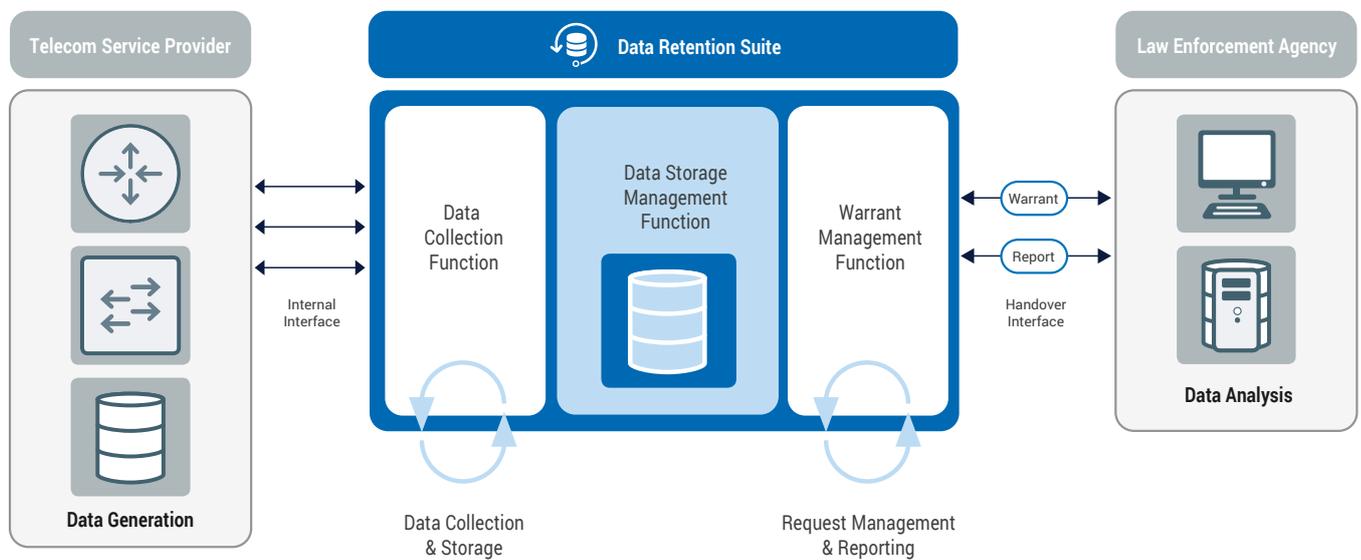


Figure 2:
Data Retention Functional Model



Data Analysis

While Utimaco DRS has been optimized for fast load and search, law enforcement agencies need additional means for visualizing and analyzing data. Only then connections, relationships, events, patterns and trends can be identified and turned into actionable intelligence. Such analysis and intelligence utilities allow investigators to represent information in different chart types, such as association charts and timeline charts.

For this purpose Utimaco DRS supports various export formats and interfaces. In the simplest case data are exported as csv files or xml files and then imported in other analysis products. As an alternative, DRS can directly

integrate with such analysis tools via the Utimaco RDI (Retained Data Interface). In this case data can be queried and loaded automatically from a 3rd party software, such as the IBM® i2® Analyst's Notebook® or other big data analytics software. Utimaco provides a purpose-built plugin for the IBM® i2® Analyst's Notebook® which gives investigators nearly the same query capabilities as on the DRS user interface. With this plugin investigators can gradually extend their analysis chart by adding data from DRS and other data sources. All DRS security features, such as access control, logging and encryption, are also available via the Utimaco RDI interface, so that company security policies can be maintained.

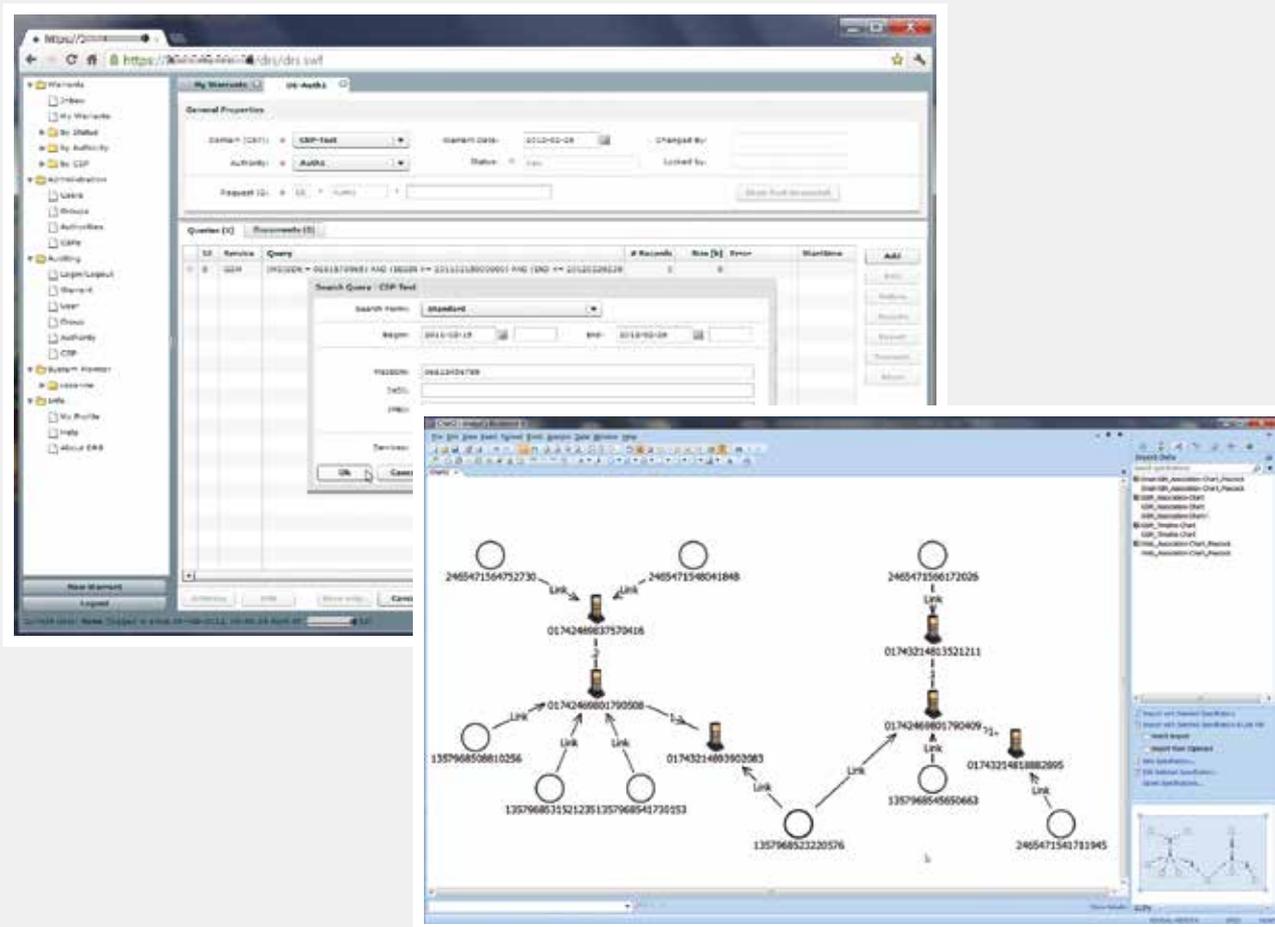


Figure 3:
Utimaco DRS and IBM® i2® Analyst's Notebook®

Utimaco DRS – Specifications

Features

- Collects communications data (CDR, IPDR) and subscriber data from any telecommunications network
- Retains large amounts of data in a powerful and secure data warehouse
- Provides very fast search and analytics in billions of data records
- Automates request processing and delivers data to authorized agencies by E-Mail, or secure IP interfaces

Highlights

▪ **Seamless Integration**

The Utimaco DRS has been designed for seamless integration into existing multi-vendor and multi-service networks. The solution can be customized easily to interface with CDR/IPDR systems, log files, subscriber databases, and other network nodes.

▪ **Multi-tenancy**

One Utimaco DRS system can be used to administer warrants and search requests for multiple network operators and service providers. The granular rights management system of Utimaco DRS can be configured to securely segregate between networks, users, and authorities and thus supports various business models like MVNO models, managed services, or cross-border service platforms.

▪ **High Performance & Capacity**

The Utimaco DRS has been optimized for simultaneous loading of big data volumes and fast query processing. The system can ingest several billion data records per day, supporting the transaction rates generated by large telecommunications networks with millions of subscribers. Average query results are returned in seconds not minutes.

▪ **Strong Security**

Comprehensive security features like role-based access control, encryption, and integrity checks prevent unauthorized access and manipulation of sensitive data during storage and handover. Full audit trails are maintained for all system and user events to provide full accountability for evidential quality.

▪ **High-availability**

Server redundancy, RAID data mirroring and real-time system monitoring are integral concepts of the Utimaco DRS to satisfy the highest availability demands and disaster resilience.

▪ **Cost-efficiency**

The Utimaco DRS runs on broadly available and cost-efficient x86 servers and uses standard SAS/SATA disks arranged in Redundant Disk Arrays. This together with excellent data compression rates keeps hardware expenses to the absolutely minimum.

▪ **Data Analysis**

Utimaco DRS easily integrates with 3rd party visualization and analysis tools such as IBM® i2® Analyst's Notebook®.

Specifications

- Dell® OEM servers
- Various configuration options from single server-appliances to multi-server clusters
- Integrated disk storage
- External SAN from 6TB to 2 PetaByte
- Red Hat® Enterprise Linux OS
- SAP IQ data warehouse
- CE marked, FCC compliant, ROHS

Services

- PSTN telephony
- Mobile telephony & data (GSM, UMTS, LTE, CDMA)
- Mobile Messaging (SMS, MMS)
- Internet Access (DSL, cable, Wimax, WLAN)
- VoIP, Push-to-Talk
- IP, CGNAT
- E-Mail, Webmail
- Subscriber data
- Other services and data sources on request

Continued on next page

Utimaco DRS – Specifications

Security

- Granular user rights management
- Remote access via https (password, certificate)
- Detailed audit trails
- Encrypted storage and handover
- Hardened operating system

Performance

- Loads up to one million records per second
- Average search performance: 5 sec per 1000 query results

Norms & Standards

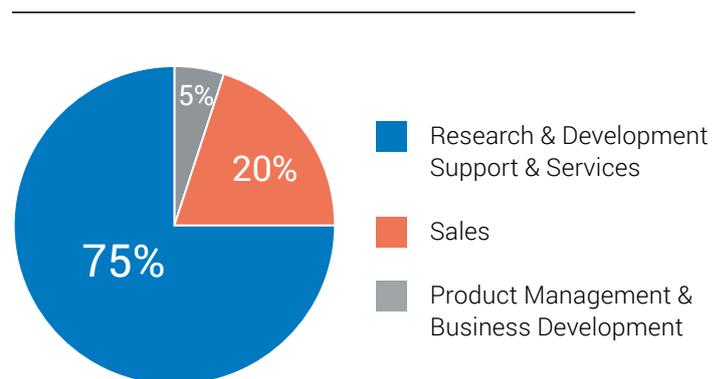
- ETSI TS 102 656
- ETSI TS 102 657

About Utimaco

Since 1994 Utimaco has been developing lawful interception and data retention systems for telecom operators and Internet service providers. Utimaco's carrier-grade lawful interception (LI) and data retention (DR) systems enable real-time monitoring and long term data retention in public telecommunication networks. The systems interface with essentially all common network technologies and communications services. Utimaco is the preferred LI partner of many of the world's leading network equipment manufacturers.

Utimaco compliance solutions help network operators, service providers and law enforcement agencies to comply with national laws and regulations for telecom monitoring. With around 300 installations in over 90 countries, Utimaco is a leading global supplier in the Lawful Interception and Data Retention market. Utimaco participates in LI standardization and supports international standardization institutes and industry associations, such as, ETSI, 3GPP, ANSI/ATIS and Bitkom.

Customers and partners of Utimaco in all parts of the world trust the long-term proven reliability and investment protection, as well as the manifold certified IT-security standards. Utimaco stands for recognized product quality, user-friendly software, excellent support and trusted high-security, made in Germany.

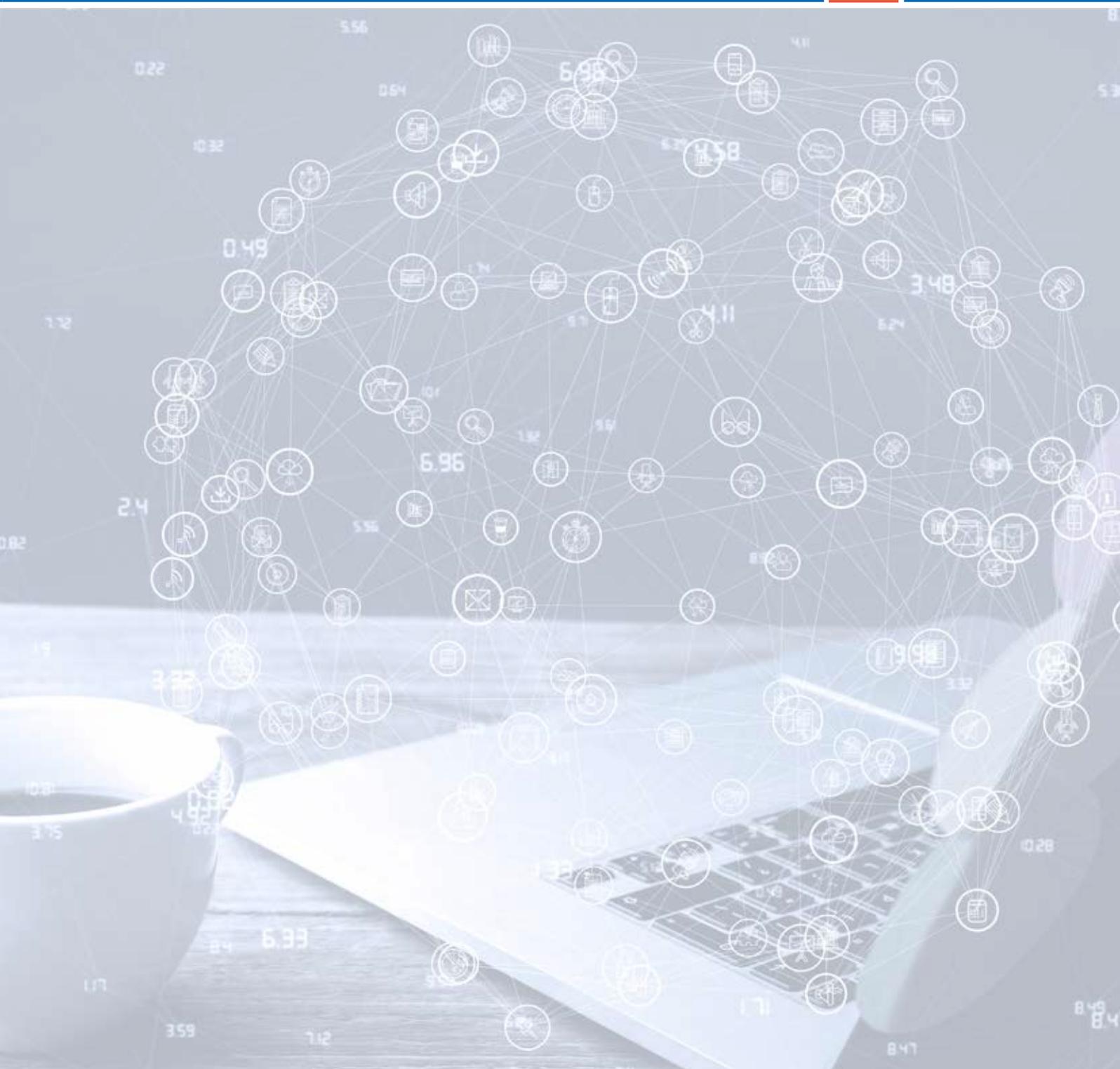


A strong team

The Utimaco LIMS and the Utimaco DRS have been developed by a team of telecom professionals with about 20 years of working experience in this field. At Utimaco, about 75% of our professionals are exclusively involved in product development and customer service. The Utimaco team is committed to ongoing investment in product research and development to provide all of our customers with the very best-of-breed solution.

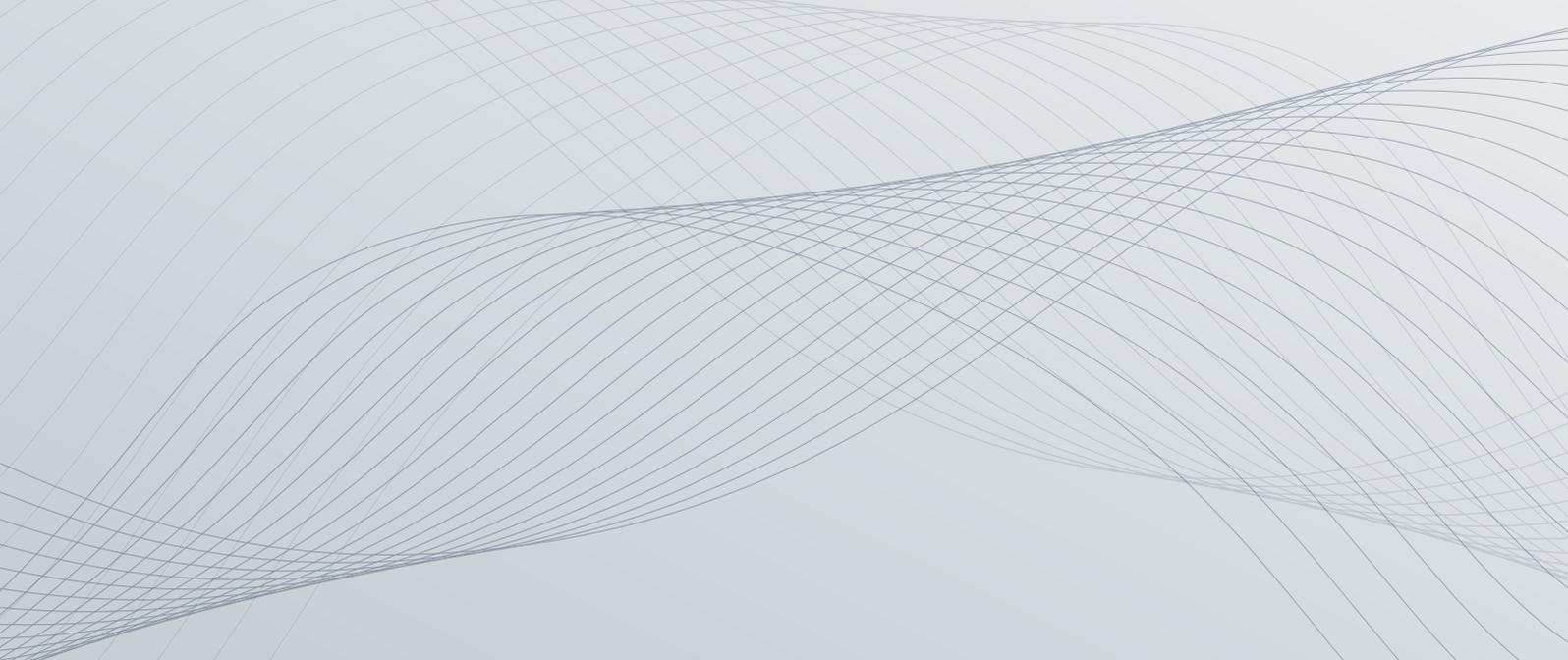
... and a strong partner

We build relationships with our partners that go far beyond the normal vendor-client relationship and are



based on trust, honesty, reliability and openness. We provide products, support, and training that contribute significantly to the technical work and business prosperity of our partners and customers. We are responsive to the needs of our customers in product design, technical support, and customer service. We provide exceptional

value and a level of personalized service which set a new standard in our industry, a standard with which our competitors must measure themselves. These are the reasons why many of the leading telecom infrastructure suppliers worldwide rely on products and solutions developed by Utimaco.



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