

# Utimaco DRS™

Data Retention Suite

Automated Data Retention for Telecommunications Service Providers



# 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 call detail 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. In Europe, for instance, the EU directive 2006/24/EC was introduced in March 2006 as a response to the coordinated terror attacks in Madrid 2004 and London 2005. The directive has led to harmonized laws within EU member states that oblige telecom operators and Internet service providers to retain call detail records and subscriber data for a period between six to twenty-four months, and to respond to inquiries by law enforcement agencies without undue delay.

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

Utimaco has addressed these new 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 sixty countries around the world.

## Challenges for Operators

- ◆ Store millions to billions of records per day of data generated at various sources in the network
- ◆ Handle hundreds to thousands of inquiries by law enforcement agencies per day
- ◆ Respond without undue delay (near-real-time)
- ◆ Maintain high security to protect data
- ◆ Be prepared for changes in range of service and network infrastructures

# 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 broadly-available X64 servers with Oracle Solaris OS. 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 massive 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 subscriber and location data.

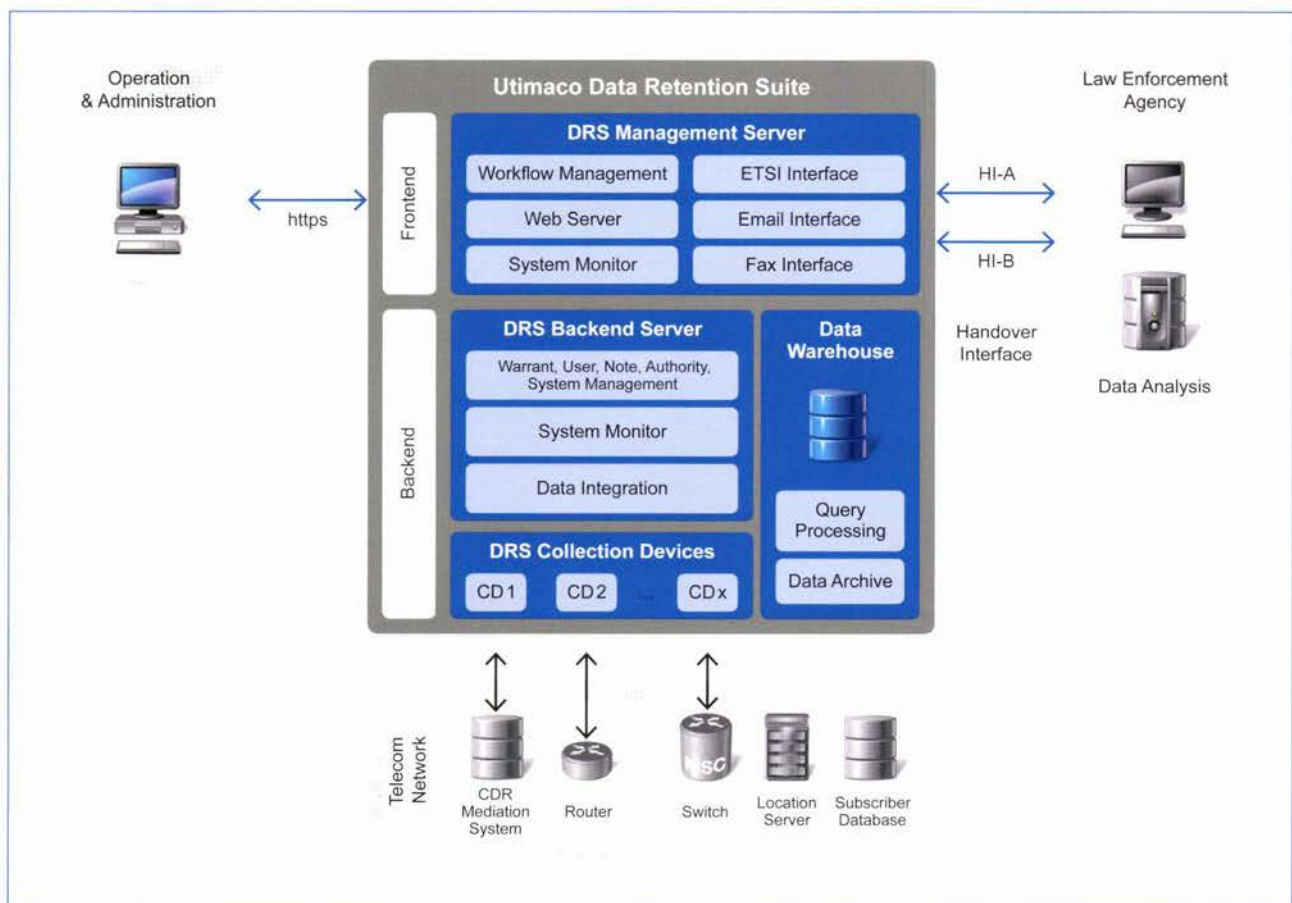


Figure 1: Utimaco DRS System Architecture



## 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 delivers data to authorized agencies by fax, e-mail, or secure IP 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 optimum 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 support LEAs.

- ◆ 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 software and hardware system 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 16 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 access CDRs and subscriber details at various sources in the network.

## Import to the data warehouse

CDRs generated by different networks nodes can be loaded into the Utimaco DRS internal data warehouse at a very high speed (up to 100,000 records per second, per server). The system simultaneously supports multiple CDR sources for telephony, messaging, e-mail, and Internet Access. Other services can be added on request.

During the data acquisition process all CDRs 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 storage system can be configured for online access at query time. This approach saves 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 handover interfaces for fax, e-mail, and for VPN connections in accordance with the ETSI retained data handover interface (ETSI RDHI).

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 ex-

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

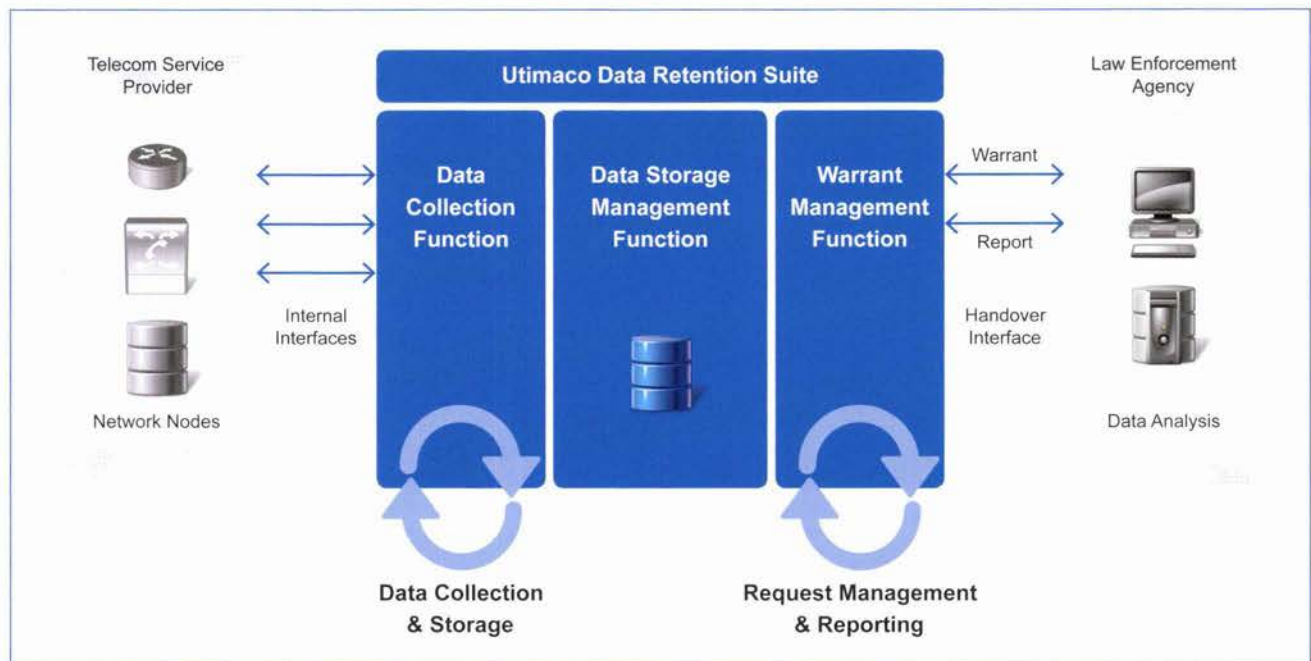


Figure 2: Data Retention Functional Model

# Optimizing Workflows

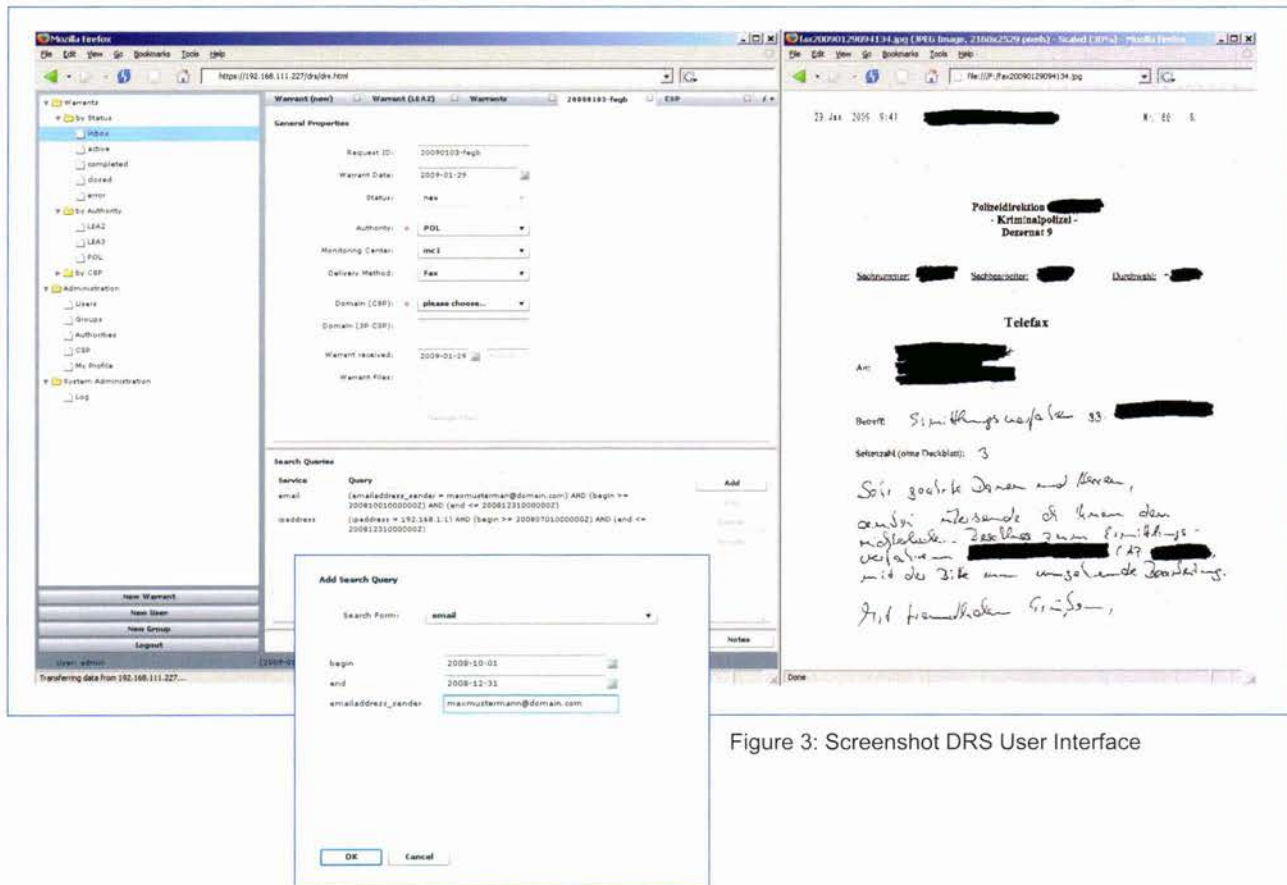


Figure 3: Screenshot DRS User Interface

Automation of workflows from the receipt of data requests from law enforcement agencies to the delivery of reports is an integral concept of the Utimaco DRS solution. The system can receive requests and warrant documents either by fax, e-mail, or ETSI RDHI (Retained Data Handover Interface). An incoming request will appear as a new warrant in the inbox of the operator screen. Where possible, all request details are imported in the warrant form automatically. After a short validation the database query can be started with just a few mouse clicks. The results will be available within seconds, ready for automatic or manual delivery.

If warrants come in as a letter or fax, pre-defined report forms assist operators to quickly translate the request into executable database queries. The results can be exported in different formats like \*.pdf or \*.csv files. The query and reporting system of the Utimaco DRS can be easily extended to support country or customer specific demands.

All internal workflows are protected by a number of state-of-the-art security measures to assure compliance to privacy laws by means of access control, encryption, integrity checks, and full audit trails. The integrated user management system allows for fine-grained definition of access rights to various functions and data sources. All system data, i.e. CDRs, subscriber data, configuration data, log files, warrants and request details, are kept in encrypted databases. And, detailed logging of all user and system events prevents misuse and enables security audits.



# 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 fax, 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 war-rants 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 massive 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-1/-5 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 X64 servers and uses standard SAS/SATA disks arranged in RAID-5 arrays. This together with excellent data compression rates keeps hardware expenses to the absolutely minimum.

### ◆ Standards-based

The Utimaco DRS is fully compliant with latest ETSI requirements in support of the European Data Retention Directive 2006/24/EC.

## Hardware specifications

- ◆ Oracle X64 servers
- ◆ Various configuration options from single server-appliances to multi-server clusters
- ◆ Integrated disk storage (up to 12TB)
- ◆ External SAN from 6TB to 1000TB (RAID-1/5)
- ◆ Oracle Solaris 10 Operating System
- ◆ Sybase IQ data warehouse
- ◆ CE marked, FCC compliant, ROHS

## Services

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

## 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 100,000 records per second (on one server)
- ◆ Average search performance: 5 sec per 1000 query results

## Norms and Standards

- ◆ EU Directive 2006/EC/24
- ◆ ETSI TS 102 656
- ◆ ETSI TS 102 657



## About Utimaco

For more than 25 years Utimaco has been a leading global provider of data security solutions. Since 1 July 2009 Utimaco Safeware AG has been part of the Sophos Group, a world leader in IT security and data protection with headquarters in Boston, US and Oxford, UK. While Utimaco data security products are now distributed by Sophos, the business units "Lawful Interception & Monitoring Solutions" and "Hardware Security Module" form Utimaco's operating businesses. Utimaco currently employs a staff of 160+.

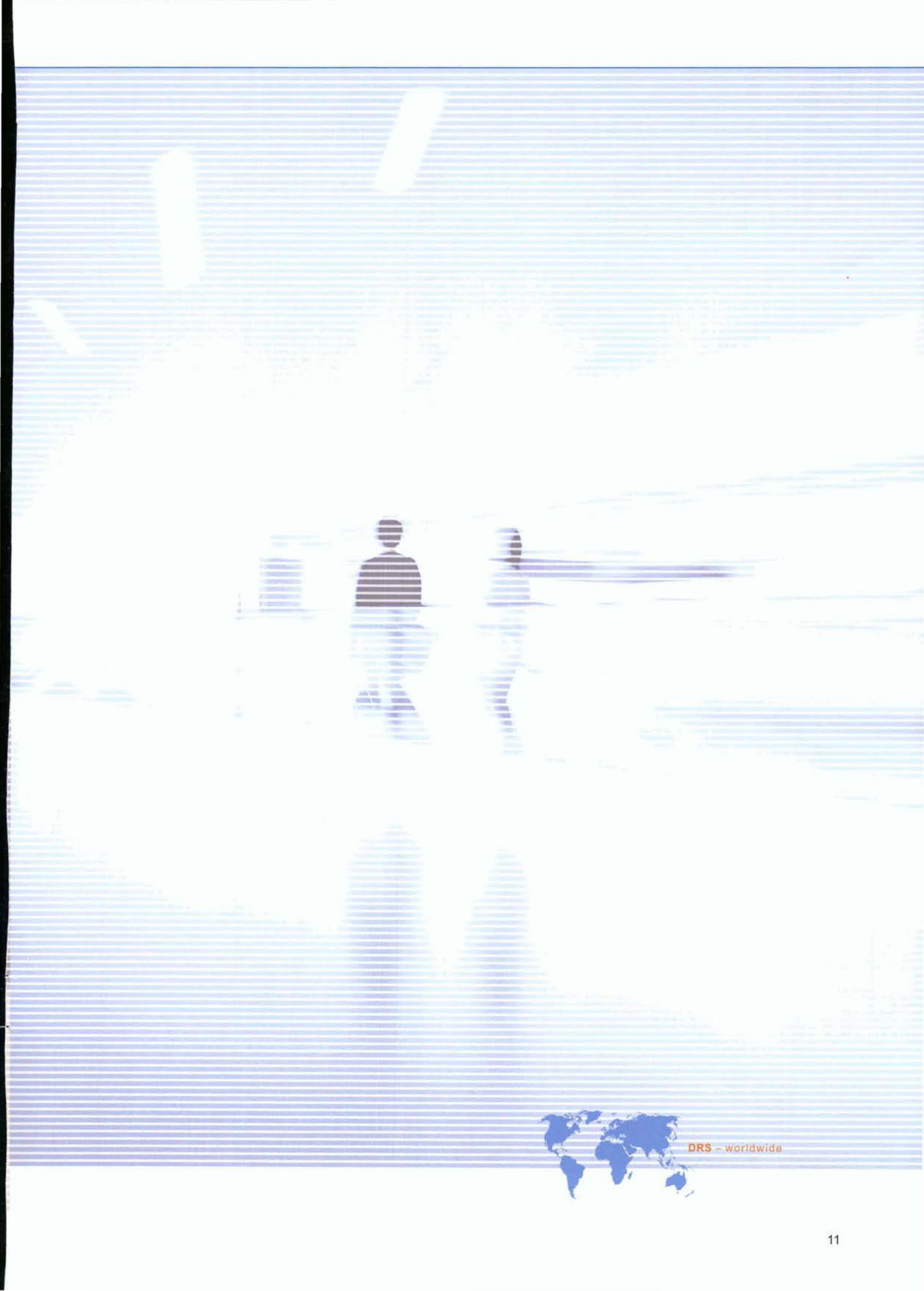
Since 1994 Utimaco has been providing lawful interception systems for mobile and fixed network operators and Internet service providers. The Utimaco Data Retention Suite was introduced in response to the EU directive 2006/24/EC and at the request of telecom customers for integrated lawful interception and data retention solutions. With more than 180 installations in about 70 countries, Utimaco is a global supplier of leading-edge technology in the LI and DR market.

### A strong team

The Utimaco LIMS and the Utimaco DRS have been developed by a team of telecom professionals with more than 16 years of working experience in this field. At Utimaco, more than 55% of our professionals are exclusively involved in product development and customer service. The Utimaco LIMS 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 Safeware AG.



DRS – worldwide



[www.utimaco.com/drs](http://www.utimaco.com/drs)

Utimaco Safeware AG  
Germanusstraße 4  
52080 Aachen  
Germany  
Phone +49 (0) 241-16 96-0  
[li-contact@utimaco.com](mailto:li-contact@utimaco.com)

Utimaco Safeware Partner:

**Copyright Information**

Copyright © 1994-2011 – Utimaco Safeware AG – a member of the Sophos group, September 2011

**Utimaco DRS™**

Utimaco DRS is a trademark of Utimaco Safeware AG. All other named trademarks are trademarks of the particular copyright holder.  
Specifications are subject to change without notice.