

# MEETING THE CHALLENGES OF DATA RETENTION: NOW AND IN THE FUTURE



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## Abbreviations and Definitions

ADSL	Asymmetric Digital Subscriber Line: A technology that delivers digital data transmission simultaneously with a regular telephone service, over the same telephone line.
BSS	Billing Support Systems: A series of systems that allow a telecom operator to calculate the correct price of a call and to bill a user for that call.
CDR	Call Detail Record: A record produced by a communications network (typically by a switch on the network) containing details of a call that passed through it.
EEA	European Economic Area: An agreement between the EU, Iceland, Liechtenstein and Norway, allowing the three countries to participate in the EU's single market.
ETSI	European Telecommunications Standards Institute: An independent, non-profit, standardisation organisation in the European telecommunications industry.
EUDRD	European Union Data Retention Directive: A colloquial name for DIRECTIVE 2006/24/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC.
IMEI	International Mobile Equipment Identity: A unique number provisioned directly in the mobile phone (or other access device). It identifies the device, but not the user.
IMSI	International Mobile Subscriber Identity: A unique number associated with mobile phone users. It is stored in the SIM inside the phone (or provisioned directly in the phone) and is sent by the phone to the network. Used by any mobile network that interconnects with other networks.
IP	Internet Protocol: A protocol defining communication across packet-switched networks.
IPDR	IP Detail Record: A record similar to a CDR, but providing information about IP-based service usage.
MVNO	Mobile Virtual Network Operator: A mobile operator marketing communication services to end users without owning the network across which the services are provided.
OSS	Operations Support Systems: A series of systems that allow a telecom operator to send information to/from its network, activate new services and keep stock of its network resources.
RDBMS	Relational Database Management Systems: A database management system which stores data in the form of tables. The relationship between the data is also stored in the form of tables.
RDHI	Retained Data Handover Interface: An ETSI-defined interface standardising how police and security services transmit warrants and receive results.
TDM	Time Division Multiplexing: A digital transmission mode typically used by the traditional public switched telephone network, allowing several communication streams to use the same channel.
TKÜV	Telekommunikations-Überwachungsverordnung: The current German regulation defining technical details (such as operator interfaces) of telephone tapping and similar measures.

## The EU Data Retention Directive

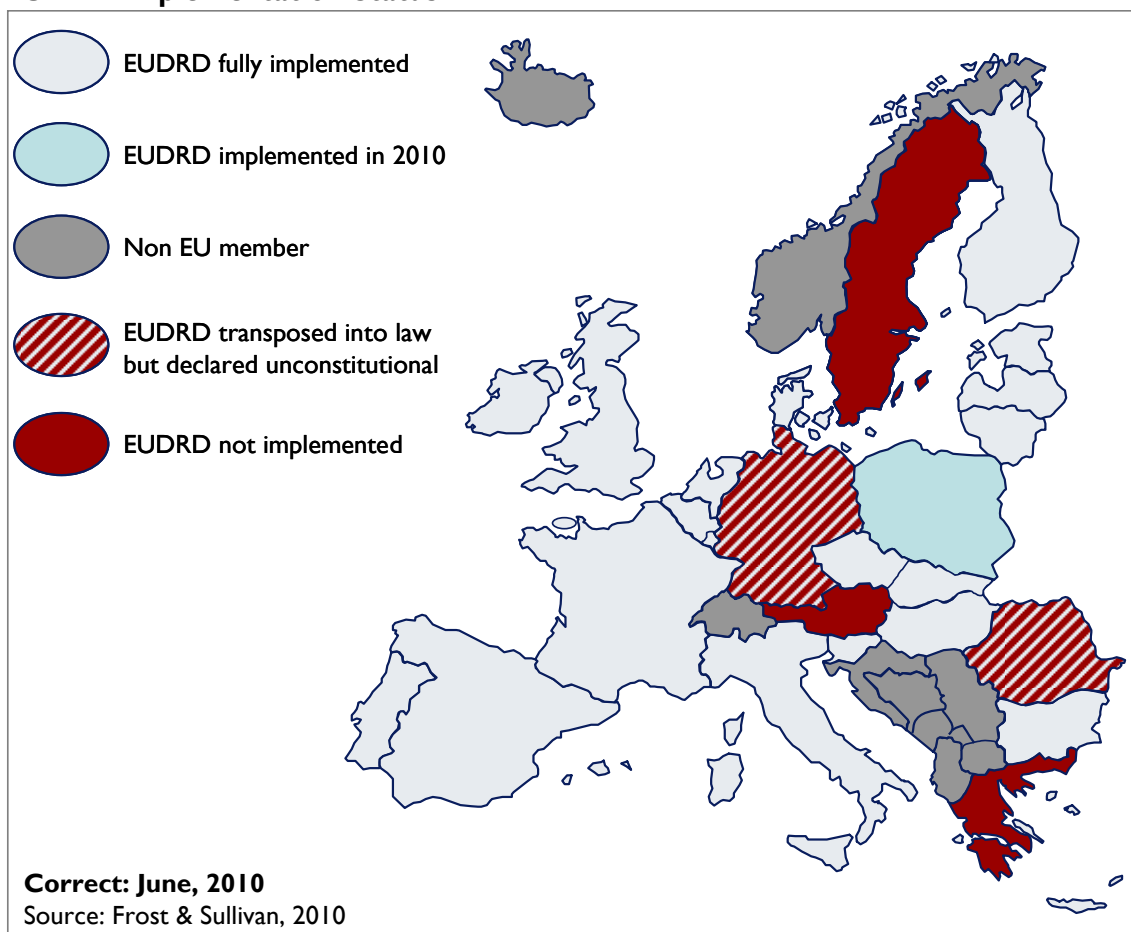
The EU Data Retention Directive (EUDRD) – adopted in 2006 – harmonises the obligations of EU communication providers to retain data and to make data available to police and security services for the prevention and investigation of crime.

The Directive applies to data generated or processed by communication services which are publicly available. As such, the Directive affects all providers of electronic communication services (e.g. fixed, mobile and cable operators; Internet Service Providers; VoIP providers; and satellite operators).

Although the Directive harmonises the data retention obligations, it has not been implemented in a uniform way by all EU members, meaning that the playing field for communication providers is not level across Europe. Some EU countries reimburse the costs associated with data retention, others provide subsidies based on transactions, and other countries again provide no funding at all.

There are EU countries that have yet to implement the Directive and countries in which the national implementation of the Directive has been declared unconstitutional. Also, the Directive only covers the retention of records that communication has taken place, not the contents of the communication: Telephone and web tapping remain controlled by national regulations.

### EUDRD Implementation Status



Sweden is one of the countries that have not yet implemented the EUDRD. The Swedish justice minister has publicly stated that she does not much like the Directive, and several Swedish politicians want to challenge the Directive in court, alleging that it might contravene the European Convention on Human Rights.

There is still much debate across Europe over the right to privacy and the risk of abuse of data retained centrally. At the same time, citizen expectations on the ability of police to prevent and rapidly solve serious crime are increasing, while funding for police and security service activities is under pressure due to budgetary constraints.

What this means to telecom operators and other communication providers is that data retention is a dynamic area – despite the EUDRD – and that it can be difficult to accurately forecast the magnitude and nature of future obligations.

With the general increase in legislation brought in to fight terrorism and other crime, Frost & Sullivan believes that data retention obligations will multiply over time and that the burden placed on communication providers will become heavier than it is today.

Because the EUDRD is the most extensive piece of data retention legislation adopted by any country or union of countries today, Frost & Sullivan believes that emerging regulations in other parts of the world will be similar. For this reason, we believe the EUDRD to be highly relevant even to communication providers outside Europe.

## Communication Providers must retain up to 15 Data Categories

As the rules stand today, communication providers must capture and retain data in a long list of categories.

### Categories of data to be retained, by service type

Fixed Telephony	Mobile Telephony	Internet Access, E-mail
<ul style="list-style-type: none"> <li>• Calling and called numbers</li> <li>• Numbers forwarded to</li> <li>• Name and address of user</li> <li>• Date/time of start and end of call</li> <li>• Telephone services used</li> </ul>	<ul style="list-style-type: none"> <li>• Calling and called numbers</li> <li>• Numbers forwarded to</li> <li>• Name and address of user</li> <li>• Date/time of start and end of call</li> <li>• Telephone services used</li> <li>• Calling and called parties' IMSI</li> <li>• Calling and called parties' IMEI</li> <li>• Cell ID of initial activation for prepaid</li> <li>• Cell IDs throughout call</li> </ul>	<ul style="list-style-type: none"> <li>• User ID of the sender and the recipient</li> <li>• Name and address of user</li> <li>• IP addresses allocated to sender and recipient</li> <li>• Date/time of log-in and log-off</li> <li>• Internet services used</li> <li>• Calling number for dial-up access</li> <li>• DSL or endpoint for broadband services</li> </ul>

Other than defining the 15 categories of data to be retained, the Directive places three additional obligations on communication providers.

## The Data Retention Periods Vary

The EUDRD defines that communication providers must retain data for a minimum of 6 months and a maximum of two years from the day the communication took place. It is up to the individual EU countries whether to mandate shorter or longer retention periods.

Most EU countries have implemented a retention period of 12 months. Under special circumstances, the Member States may extend the retention period beyond two years. To communication providers, this means that the future storage requirements can be unpredictable.

## Data Retention is Time Critical

When the police (or security services) present a request, communication providers must make the relevant data available without “undue delay”. Data requested for terrorism prevention purposes is more time-critical than anything else, and a delay of just a few hours could have severe consequences.

Communication providers are likely to have the required data dispersed across their networks, meaning that a single police warrant can involve several systems and departments. Also, communication providers must make sure that only data covered by the warrant is passed on to the police.

## Data Security is Paramount

Communication providers must ensure the completeness and integrity of the data they retain. This means that they must have a procedure in place to track all relevant categories of data and to capture all data points within those categories.

Also, communication providers must protect the data against accidental or intentional destruction; accidental loss or alteration; unauthorised or unlawful storage; processing, access, disclosure or accession by unauthorised persons.

Finally, at the end of the retention period, the communication provider is obliged to destroy the retained data.

## Communication Provider Challenges and their Evolution

The EUDRD was written to serve police needs and to guarantee data security. What the Directive does not consider is the heterogeneous nature of the networks and systems of most communication providers.

This is why meeting their obligations under the EUDRD can create formidable technical, financial and planning challenges – challenges which will grow over time.





## Data Completeness and Integrity

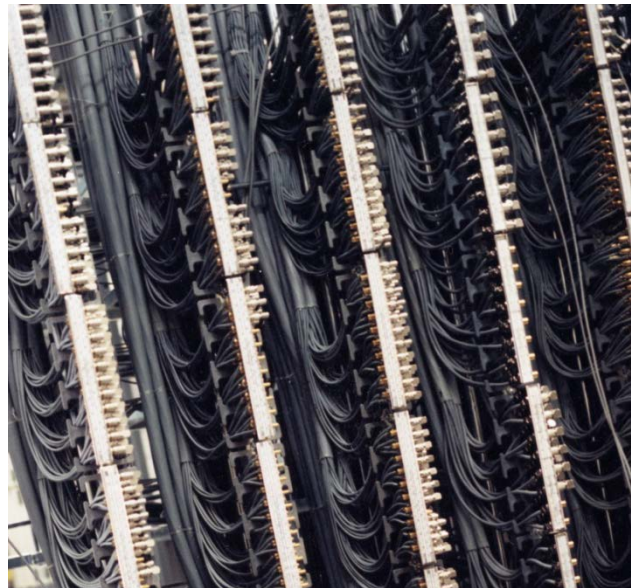
Voice call detail records (CDRs) on a traditional TDM network are straightforward to collect and make available. For the most part, this data comes from a single type of network node (typically a switch or a CDR mediation platform) and must simply be mapped to the user. For mobile operators the situation is more complex. There are many sources of CDRs, due to the different services (e.g. postpaid calls, prepaid calls, SMS, MMS, mobile data, roaming calls, etc.).

Often, CDRs relating to unsuccessful call attempts and incoming calls are not stored, because that type of traffic is typically not billable. The EUDRD does, however, require that such CDRs should be retained, if they are generated by the network

An IP session record is even more complicated. It includes information from multiple network servers and databases. Communication providers need to retain IP records due to the requirement to capture both e-mail traffic and internet access, and the networks were not designed to do this.

The rising amount of VoIP traffic that is not billed on a per call basis aggravates the problem for communication providers. The continuous evolution of networking technologies towards IP will further add to their woes.

Some network owners do not have a direct relationship with the end user, and this adds a further level of complication. Many mobile network operators host several MVNOs on their network, and a similar situation exists in the Internet access space. Network operators must segregate data related to different MVNOs and ISPs as well as data related to their own end users.



What all this means is that existing CDR-based systems are not capable of supporting the full scope of the EUDRD without major upgrades, meaning that communication providers will need to deal with missing data (e.g. location information with all services, Internet logs, e-mail logs, incoming calls etc.).

## Number of Records

The sheer number of detail records is a challenge. Frost & Sullivan estimates that a large communication provider could have in excess of a billion records to capture and process every single day. Although each record is not more than 300-400 bytes on average, there must be a proper system in place to mediate, load and store the data efficiently.

The development of the communications market with more and more services coming online that will require data to be retained will result in the already large number of records to increase further.

## Data Centre Demands Spiralling

There is hardly an organisation in the world not concerned about the capacity of its data centre(s). In recent years, the development of data loads (i.e. the computational loads of data to be processed) and the related storage requirements has been truly exceptional. Not only has the increase in data loads been enormous, it also appears that the rate at which data loads increase every year is not slowing down.

Many data centres are already struggling to cope with demand, and research conducted by Frost & Sullivan has shown that two thirds of organisations believe they will run out of data centre capacity within the next two years – if they have not run out already.



Once stored, a communication provider's data centre must protect the records in order to live up to the stringent data security requirements of the EUDRD. This, in itself, requires a rethink, because most data centres were not set up with the EUDRD in mind, and because security measures have detailed implications all the way down to the physical location of the data centre.

In short, the EUDRD adversely affects an already difficult situation for many communication provider data centres. As the number of retained records grows, the storage requirement will grow. Most organisations are acutely aware of this, but they do not always have a solution readily available.

## Financial Challenges

The EUDRD creates both direct and indirect financial challenges for communication providers. The direct financial challenges relate to the cost of implementing and maintaining a data retention system and to the handling of the individual requests for data to be made available to the police.

Some countries subsidise the direct data retention costs, but subsidies are neither fully transparent, nor consistent across the EU countries, and some countries provide no subsidies whatsoever.

Frost & Sullivan regards the United Kingdom as a best practice example. The UK operates a reimbursement scheme which covers the capital expenditure of systems and operating expenditure of staff, with a budget of approximately £30 million per year (≈€36 million).

Even so, Frost & Sullivan estimates that the average yearly cost of living up to the obligations of the EUDRD could run as high as €0.10 per subscriber (or prepaid user). The costs are particularly high for operators that have frequent interaction with the police and security services, and we find the main cost driver to be the high level of manual processes on which many operators still rely, tying up skilled resources to ensure timely EUDRD compliance.

What this means to communication providers is that, even if they receive a government subsidy towards meeting the EUDRD obligations, they need to be looking at minimising operational costs by improving their automated response capabilities.



Finally, no governments pay any subsidies or compensation for indirect data retention costs, and Frost & Sullivan finds that many operators fail to even capture these costs and recognise them as EUDRD compliance costs.

Indirect costs have different root causes. They can be upgrade costs at a data centre or even real estate costs at a data centre that outgrows its existing facilities. Indirect costs can also be the cost of disruption to business flows and processes, as existing systems are modified to cope with data retention, or it could be the opportunity cost of staff whose time is channelled from revenue-generating activities (e.g. the provisioning of end-user billable services) to EUDRD activities which are not revenue generating.

A relatively modest investment in more sophisticated data retention systems and procedures could create significant savings elsewhere in the organisation.

## Lack of Standardisation

Even though ETSI has defined an electronic handover interface – the RDHI – which would standardise the way the police and security services send warrants and receive results, the handover interface has not yet been implemented.

This means that communication providers must be prepared to receive warrants in many different forms: Faxes, e-mails or even traditional letters. It also means that the processing of a single warrant can involve a lot of purely manual work. This obviously generates an unnecessary cost – as we discussed in the previous chapter – but it also creates organisational challenge because there is no easy way to measure performance and to facilitate easy follow-up.

Communication providers also need to live up to their data protection obligations under the EUDRD, meaning that they must exercise due care when transmitting retained data to the police and in making sure that only records covered by a warrant are actually transmitted. Moreover, it is not in all cases easy for communication provider staff to establish whether or not a police request for data is valid and justified.

Unfortunately, Frost & Sullivan does not believe that the RDHI will be made mandatory any time soon. In many European countries, the responsibility for policing is fragmented, and numerous police and security services exist (some of them even working in parallel with similar remits) so streamlining the police side of things could be tricky.

In all fairness, the national regulators in some countries have strong ambitions to establish the RDHI as a standard, and these ambitions obviously enjoy the support of the communication providers. In Germany, for example, the TKÜV regulation already specifies the RDHI as an optional interface.



That said, the RDHI will only be a truly effective tool if it is exclusive, meaning that communication providers would be allowed to reject warrants transmitted through any other means. Given the

relative lack of IT sophistication of many European police forces, the European ministries of the interior are not likely to throw their weight behind the RDHI, just to help the communication providers.

An even greater standardisation challenge relates to cross-border data flows, particularly for pan-regional operators, as varying national legislation does not adhere to EU's freedom of transfer of information.

## Political Challenges

Because most EU directives need to be transposed into national legislation (in most cases) before they become a source of law, the EU data retention regulations are open to national differences in implementation and interpretation. This creates a political challenge for communication providers, because they cannot be certain that their data retention obligations will not change, even if the Directive remains the same, due to national political intervention.



At the moment, response times and standards are effectively different across the different levels of service providers in Europe, and there are even inconsistencies between similar operators in the same countries. In most countries, parliament will have voted to authorise a minister (e.g. the minister of the interior, the justice minister or the minister of communication) to specify the detailed interpretation of the law. There is nothing stopping a minister from issuing a strict regulation if he or she feels communication provider performance to be sub optimal. If there were ever a case in which it could be alleged that a serious crime had not been prevented due to slow response times, ministers would most certainly leap to tighten regulation.

Finally, growth of different types of new communication technologies, not covered in the current Directive, could result in extended data

retention obligations to cover the new means of communication, leading to further challenges for communication providers.

## Different Solutions to Meeting the Challenges

We have established that the vast majority of communication providers will not be able to meet the challenges of the EUDRD unless they take concrete measures. They can adapt existing systems; invest in a new, dedicated system; or outsource data retention altogether.

### Adapting Existing Systems

Adapting existing systems may be a good option for smaller telecom operators with a limited service offering.

All operators already have operations and billing support systems (OSS/BSS) in place, and most operators own those systems and operate them in house. Small MVNOs may outsource OSS/BSS to a third party (typically the network operator or enabler).

Existing OSS/BSS solutions include sub systems that pull data off the network nodes and generate CDRs; sub systems that calculate the cost of the call (a function referred to as “rating” or “charging”) and sub systems that issue a bill for the call. These sub systems will map CDRs to individual users.

Most operators will also have fraud prevention and detection systems in place (some referred to as “revenue assurance”) which track usage by individual post and prepaid subscribers and makes sure that a user does not run up unduly high bills or is allowed to continue calls after he or she has depleted a prepaid credit.

All the solutions and sub systems can potentially be adapted to provide EUDRD compliance. In the short term, adapting existing systems can be a cheap solution which avoids large capital outlays. There are, however, a number of important caveats.

All the solutions and sub systems we have described have the one thing in common that they were designed to handle chargeable calls (or chargeable internet access). Consequently, they are not well suited to capturing traffic for which an operator does not charge on a per call basis or per megabyte basis (e.g. e-mail, flatrated broadband access, unsuccessful call attempts, incoming calls etc.).

The adaptation of existing systems are in-house projects, and operators need to manage the development process and the lifecycle of the new solution. This is not cheap, and the cost of integration may not be correctly captured in organisations. With in-house projects, there is a tendency to just deal with the immediate issues and not consider future requirements, meaning that an adapted existing system might not be a future-proof solution.

When operators implement upgrades and other developments to existing systems, there is always a risk of disruption. The billing function is at the heart of every operator. Even short disruptions – when operators are unable to process bills for just a few days – will have an immediate and adverse effect on cash flow.

### Implementing Dedicated Solutions

An alternative to interfering with existing systems is the implementation of a dedicated data retention solution.

There are a number of dedicated data retention solutions on the market that were conceived for data retention and store data separately. The vendors of dedicated solutions vary in their background

(there are specialised vendors, storage vendors, telecom equipment vendors, security vendors and system integrators); in their business models and go-to-market strategies.

Over the past few years, Frost & Sullivan has seen the market for dedicated solutions grow. Clearly, many communication providers have felt encouraged to invest in more sophisticated data retention solutions. Many of these communication providers share the expectation that their data retention obligations will grow in the future, due to increasing concerns in society over criminal activity and terrorism.

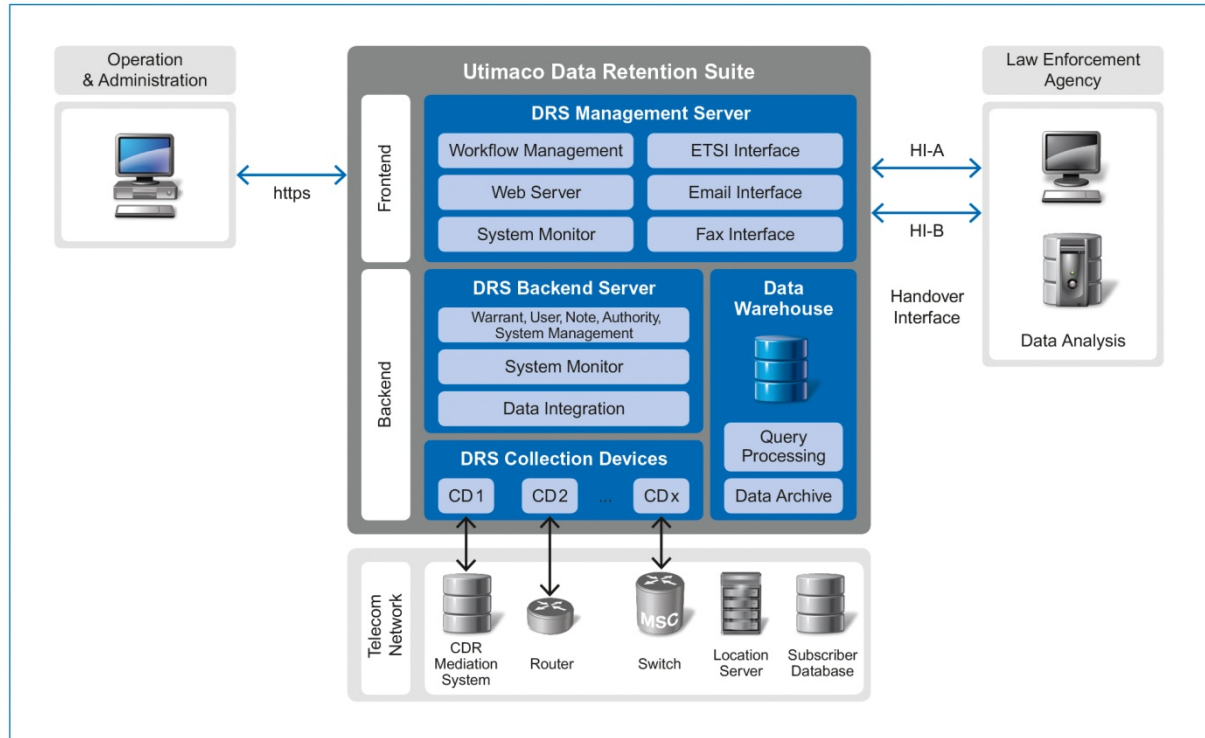
Despite the initial investment, for most communication providers, Frost & Sullivan believes that dedicated systems will be the cheaper option in the medium to long term. Also, in countries where the data protection regulation allows data mining for commercial purposes, a dedicated solution will give communication providers a better, more complete picture of usage patterns, allowing them to carry out complex analyses for business development and planning purposes.

In this whitepaper, we will analyse one good example of a dedicated data retention solution – the Utimaco DRS™.

Headquartered in Germany, Sophos-owned Utimaco Safeware AG has addressed the challenges of the EUDRD with the introduction of an all new, purpose-built solution for telecom data retention. The Utimaco DRS™ is based on the experience and technology of Utimaco's world-leading lawful intercept system, the Utimaco LIMS™, deployed by telecom operators in more than sixty countries around the world.

## Utimaco DRS™ is a Valid Data Retention Solution

Utimaco DRS™ (“DRS” stands for Data Retention Suite) is built around one front-end component – the DRS Management Server – and two back-end components – the DRS Backend Server and Data Warehouse, as illustrated below.



Source: Utimaco Safeware AG, 2010

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

## Data Warehousing Solution

In one of the previous chapters of this whitepaper we have seen why storage is such a fundamental part of any data retention system, so we will examine the storage component of Utimaco DRS™ in some detail.

Three approaches to storage exist:

- Data Warehousing
- Tiered Storage
- Relational Database Management Systems (RDBMS)

The storage component of Utimaco DRS™ is a data warehousing solution. The advantage of the data warehouse is that it can handle huge volumes of data without reducing the accessibility of the data but is generally not the cheapest solution. Tiered storage, on the other hand, archives older data in moderate to low performance databases, thereby reducing the cost of storage. The disadvantage is that the accessibility of the data is reduced. RDBMS provides fast and precise retrieval but is not well suited for billions of small records like CDRs/IPDRs, as they generate too much overhead and provide poor query times. RDBMS are designed for transaction, not for fast queries and analytics.



Frost & Sullivan finds that Utimaco has taken an innovative approach to data warehousing, aiming to provide the best of both worlds – swift data handling and low cost. The organisation of the data in the DRS data warehouse differs significantly from common relational databases. DRS arranges the data by column rather than by line, automatically indexing tables but avoiding the overhead 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. Compression rates between 40% and 80% are common for CDR data.

## **Multi-tenant Solution**

A single 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.

## **Configurable Workflow**

Utimaco DRS™ incorporates a configurable workflow management system which reduces operational expenses by automating the administrative tasks of request handling and delivery of search results to authorized agencies.

Comprehensive security mechanisms like granular user management functionality, strong access control, encrypted storage and handover, and full audit trails of all user and system events, are fundamental features to fulfil the EUDRD obligations without compromising compliance with national data protection laws.

## **Cost Advantage**

According to Utimaco, the average yearly cost of complying with the EUDRD using Utimaco DRS™ could be as little as €0.01 per subscriber – or ten times lower than the costs currently incurred by some communication providers.

If one compares to the alternative of adapting existing OSS/BSS solutions to cope with data retention requirements, Frost & Sullivan is satisfied that Utimaco DRS™ will provide lower overall data retention costs, better response times for handling warrants as well as less complicated workflows and internal procedures.

## Beyond the European Union

Because the EUDRD is the most extensive piece of data retention legislation adopted by any country or union of countries today, Frost & Sullivan believes that emerging regulations in other parts of the world will be similar.

The issue of data retention is critical for homeland security regardless of what country enacts such regulations, yet the methods and solutions needed to satisfy these requirements must account for the importance of subscriber information and avoid violating the privacy of individuals who are not subjects of criminal investigations. This need was anticipated by the EUDRD and will likely be a part of other legislation throughout the world.

## EEA and Australasia

The EEA allows participation in the EU Single Market by non EU members, on condition that the non EU members adhere to a significant portion of the EU regulatory framework. The EEA has taken a tough stand on money laundering and bank secrecy, and data retention would logically be covered by the agreement. The EEA has, however, postponed the implementation of data retention provisions until a joint committee has reached political agreement on the inclusion of the EUDRD into the EEA framework.

The global need for police and security service authorised data retention is gaining significance world-wide and will be a major concern for many countries in the coming years due to security threats from current global events. Frost & Sullivan is seeing data retention needs outside Europe and North America come into focus. Countries such as New Zealand and Australia as well as some of the nations in Southeast Asia have or are now considering data retention legislation.

## United States

Although the Obama administration has yet to state its position with regard to enacting a data retention law, Frost & Sullivan believes that enhanced data retention directives will likely be drafted



for legislation in the United States, as soon as the presidency has dealt with some of the more pressing economic agendas.

Since 9/11 there has been a shift in the perception of the American public of the balance between civil liberties and effective crime prevention. Because data retention is such a powerful tool which is relatively inexpensive (for the law enforcement agencies) to implement, we think that data retention legislation, if it comes, will be far less controversial today than it would have been ten years ago.

Current US laws define a data preservation obligation, not data retention. Data preservation only requires communication providers to retain specific information explicitly requested by the law

enforcement agencies. This, of course, is very different from the concept of data retention, as defined by the EUDRD.

Over the last couple of years, legislation has been proposed in the US that would require companies to hold on to data for specific time periods without the requirement of a government request. Such legislation would mirror the EU's data retention directive. Many spectators believe that any proposed legislation would, in first instance, apply to ISPs and require retention for a period to be determined by the Attorney General.

The US has an even more fragmented approach to policing than countries like the United Kingdom and Italy, and this is certainly a challenge for law-makers. We can, perhaps, assume that the US will have learnt important lessons from Europe and will have addressed issues such as the standardisation of the interface between law enforcement agencies and communication providers.

Currently, it is common practise amongst operators and ISPs to store communications data for all kinds of other purposes (billing, fraud prevention, data mining etc.). US law does not require operators and ISPs to destroy this data within a certain time period, so it is fair to say that the current US system lacks important regulations and restrictions in regards to data privacy. A subpoena is sufficient for law enforcement agencies to request potentially sensitive personal data. If the US introduces data retention, it will have to also address the existing privacy deficit by mandating that data be destroyed after a certain period, and this will significantly add to the complexity of communication provider operations.

Frost & Sullivan believes that a solution like the Utimaco DRS™ will become a necessary tool for US communication providers to deal with future data retention requirements.

## Beyond Telecommunications

Frost & Sullivan expects that future developments of the EUDRD will span across other sectors. An extended scope of the EUDRD – or new directives that might replace it – could cover sectors such as airlines, train operators, banks, insurance companies, retail, entertainment and the healthcare sector.

In some countries, there are national initiatives to that effect, some driven by the trend towards e-government and e-healthcare, and a desire to deliver services to citizens more efficiently to offset the effects of budget cuts. Frost & Sullivan is already seeing a beginning customisation of dedicated data retention solutions to meet the requirements from other sectors.

Frost & Sullivan believes that, over time, as more complex customer service offerings become prevalent by providing a real-time component based on presence, location and/or preference, the need for retaining and correlating data, not only to address police and security services but also to address other business needs on a near real-time basis, will be the norm rather than the exception.

We also believe that data retention can become a revenue stream for some communication providers. As data retention obligations are introduced in other sectors, market players will be looking at outsourcing, opening up a market for third-party data retention service providers. Telecom operators and ISPs, having amassed unrivalled experience in this field and having already invested in sophisticated data retention solutions, will be in a good position to exploit this opportunity.

## Conclusion

We have shown that the far-reaching provisions of the EU Data Retention Directive create significant challenges for communication providers throughout Europe.

Communication providers trying to decide what steps to take to address these challenges should think very carefully about whether to adapt existing systems or invest in a dedicated solution, and they should consider the long-term implications.

Whereas adapting existing OSS/BSS solutions is a viable option for smaller telecom operators with simple service offerings, Frost & Sullivan believes that the majority of communication providers would benefit from the implementation of a dedicated data retention solution.

Given the diversity of solutions in the market, communication providers should ensure an exhaustive feasibility analysis of the varying capabilities of each solution, particularly in terms of scalability and the viability of upgrades in meeting future requirements. Selecting a future-proof solution is particularly important, as the increase in the amount of legislation concerning terrorism and crime, is likely to lead to more and stricter data retention regulation.

Frost & Sullivan has analysed the Utimaco DRS™ and concludes that this is a valid solution which will enable communication providers to effectively meet the challenges of data retention. We are satisfied that Utimaco DRS™ will provide cost savings in the medium term; improve workflows and procedures; that it will integrate with legacy systems and networks; and that it will handle vast quantities of data and provide fast response times.

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## About Utimaco

For more than 25 years Utimaco has been a leading global provider of data security solutions. 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 LI and DR solutions. With more than 160 installations in 60 countries, Utimaco is truly a leading supplier in the worldwide lawful interception market.

Utimaco participates actively in a range of standardization institutes and is an active member of ETSI (European Telecommunications Standards Institute) and various other associations like eco, VATM, Bitkom, Breko and the WiMAX forum. In this way, Utimaco participates in market developments and supports other members with its competence.

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 and Monitoring Solutions" and "Hardware Security Module" form Utimaco's operating businesses. For more information please visit <http://lims.utimaco.com>.

## About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost fifty years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 40 offices on six continents. To join our Growth Partnership, please visit [www.frost.com](http://www.frost.com).