



Utimaco Safeware AG

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Data Retention – Efficient & Compact

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utimaco[®]
safeware

Utimaco Safeware

Celebrating 25 Years in the IT security business

- ▶ Founded in 1983
- ▶ Listed on the German Stock Exchange
- ▶ €59.2 million (fiscal year 07/08)
- ▶ 300+ employees in offices worldwide
- ▶ Headquarters in Germany
- ▶ 12 subsidiaries and established distributor and partner network around



◆ Offices
◆ Reseller/Distributors

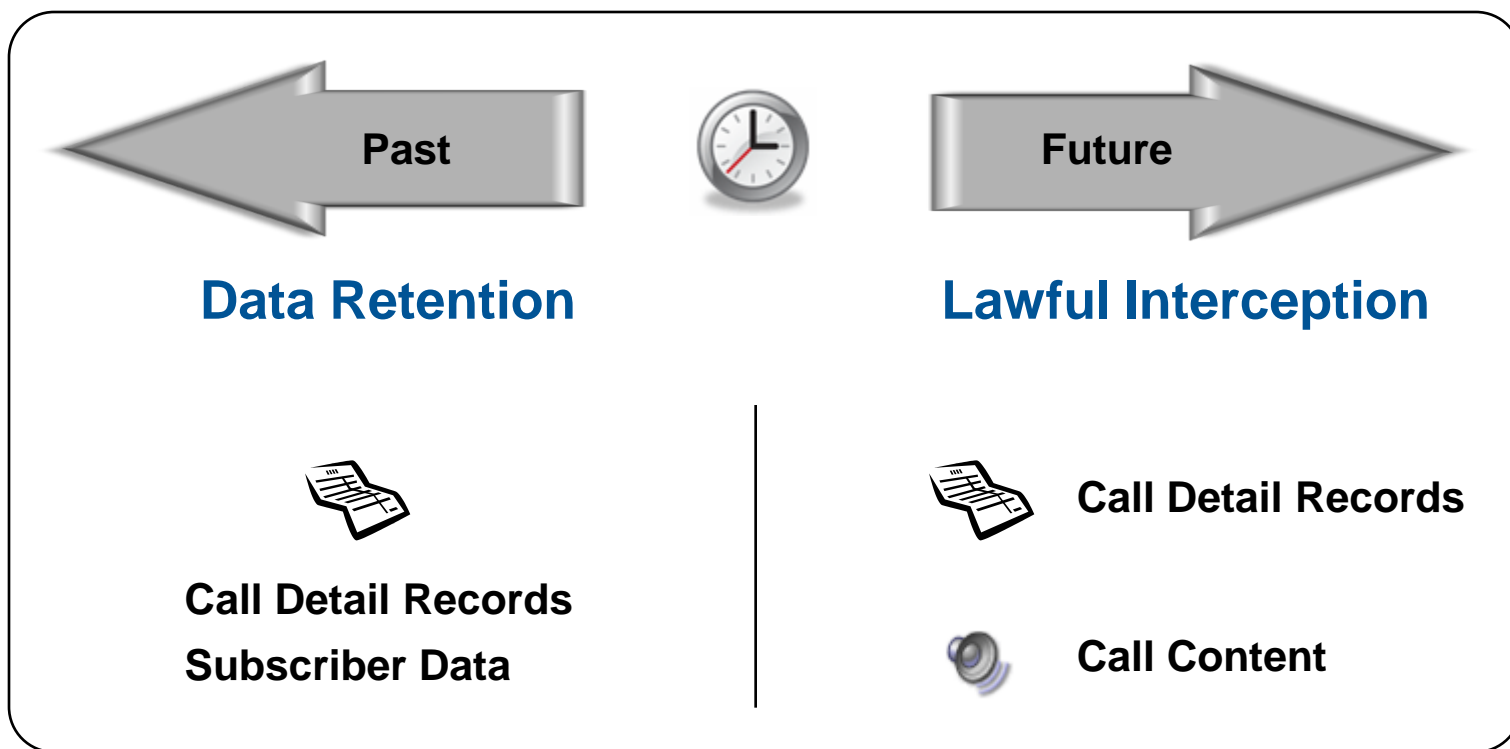
Utimaco LIMS™

Competence in Lawful Interception

- ▶ Utimaco has been providing LI solutions since 1994
- ▶ Worldwide operations: more than 130 installations in 60 countries
- ▶ LI systems for 10 thousand to 50 million subscribers, from 100 to 10,000 targets
- ▶ Strong partnerships with many of the leading telecom infrastructure vendors
- ▶ Compliant to international LI standards of ETSI, 3GPP, ANSI/ATIS, CableLabs
- ▶ Conform to numerous national telecommunication laws

Utimaco DRS

Data Retention vs. Lawful Interception



- ▶ Complementary means to assist law enforcement and anti-terrorism
- ▶ Technically many similarities

Data Retention – a quick recap

What?

- ▶ Storage of subscriber traffic related data (CDRs) and subscriber data for 6-24 months, depending on country regulation
- ▶ Data that is generated or processed in connection with the provisioning of telecom services
- ▶ For telephony (fixed, mobil, VoIP), messaging, e-mail, Internet access
- ▶ However no content of communication
- ▶ Delivery of data upon lawful authorization with undue delay

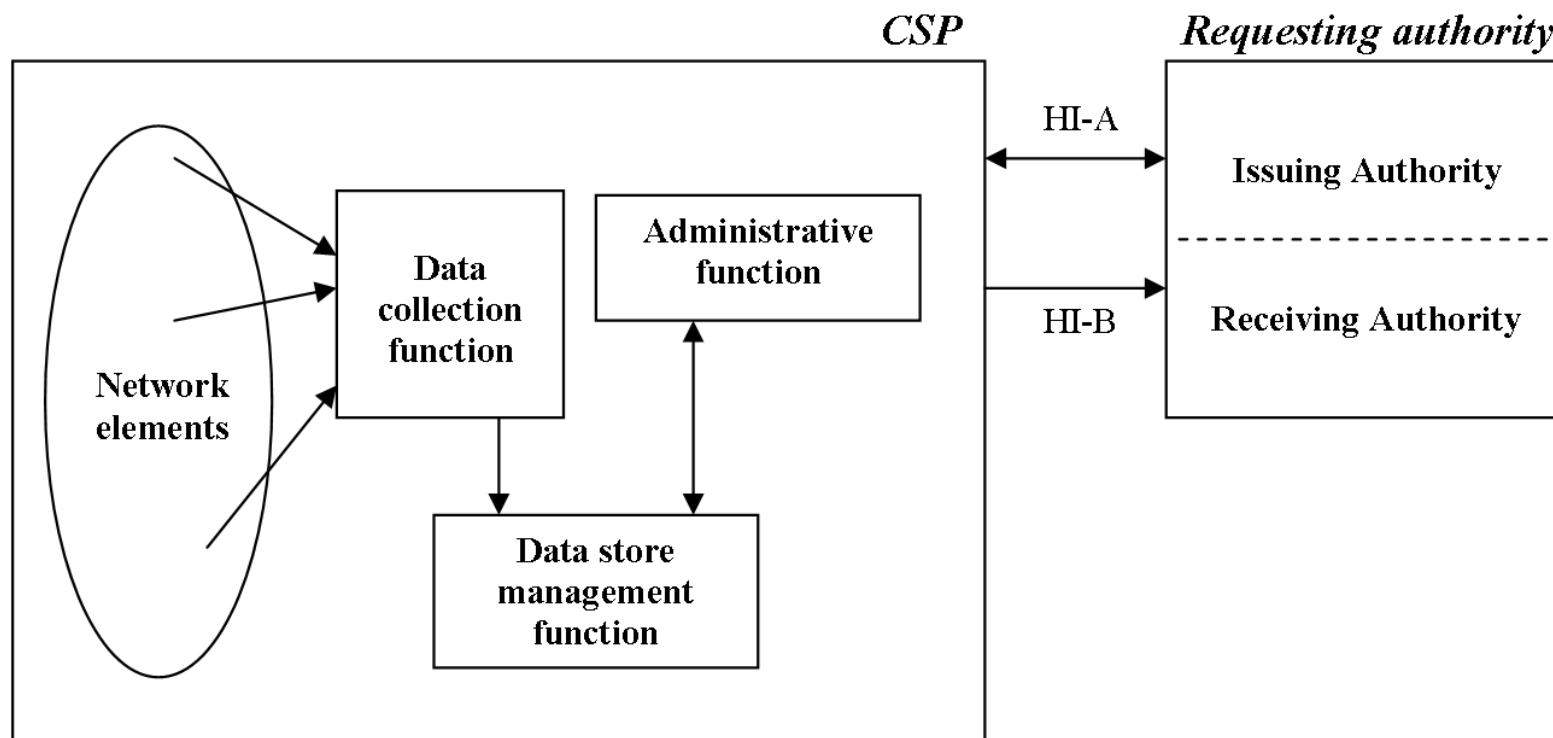
Why?

- ▶ Support law enforcement agencies

References

- ▶ National laws and regulations
- ▶ EU Directive 2006/24/EC
- ▶ ETSI standards
 - ◆ TS 102 656 (LEA requirements)
 - ◆ Draft TS 102 657 (Retained data handover, aka. TS LI-00033)

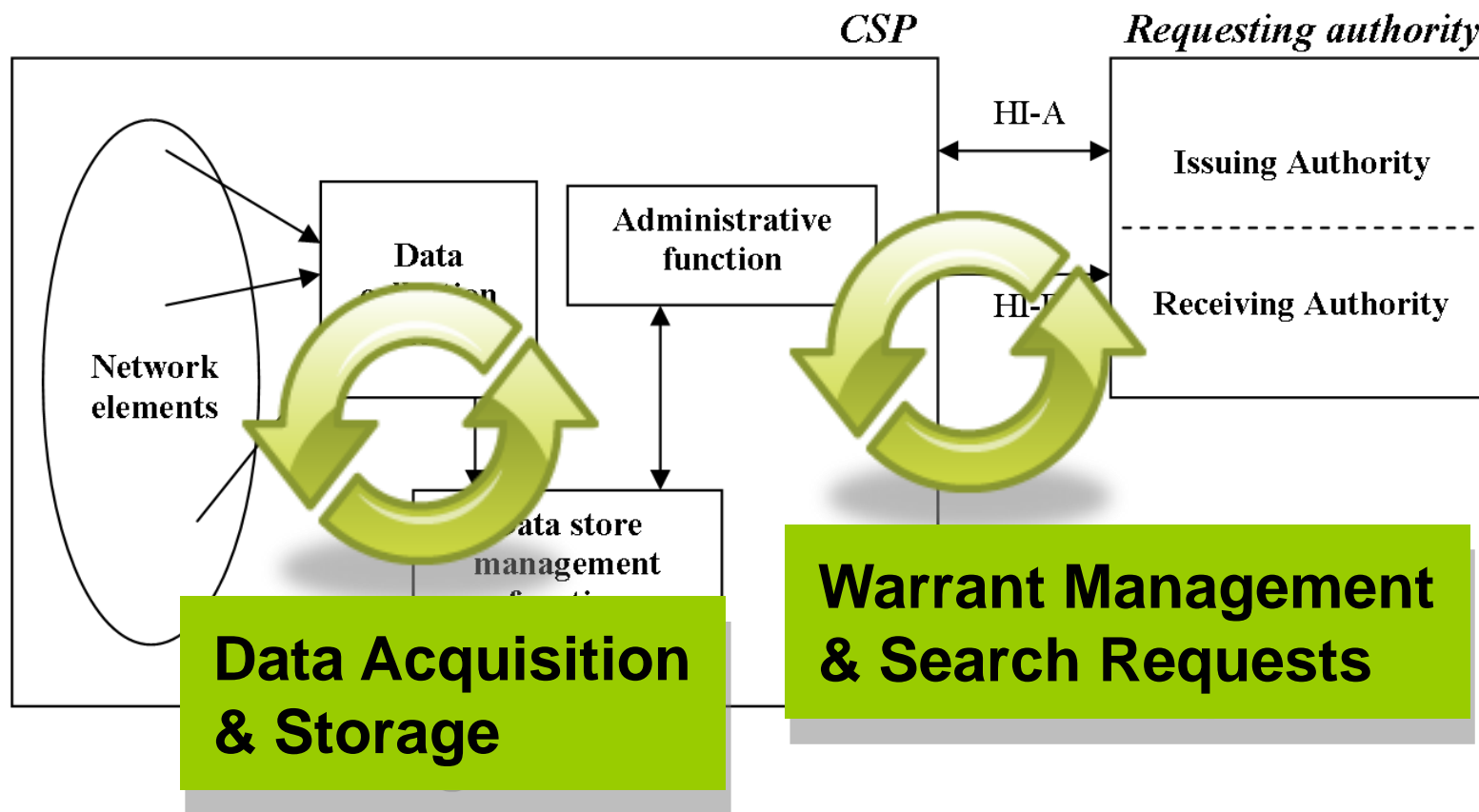
DR reference model according to ETSI



CSP = Communications Service Provider
HI = Handover Interface

DR reference model according to ETSI

two workflows



Challenges

‘Operator concerns’

▶ Costs

Data Retention **does not add any value**, but is pure cost of business. Hence operators need to minimize costs for installation (CAPEX) and operation (OPEX).

▶ Collection

Required data is available at **various systems** and must be integrated. Large operators process more than **a billion CDRs per day**.

▶ Compliance

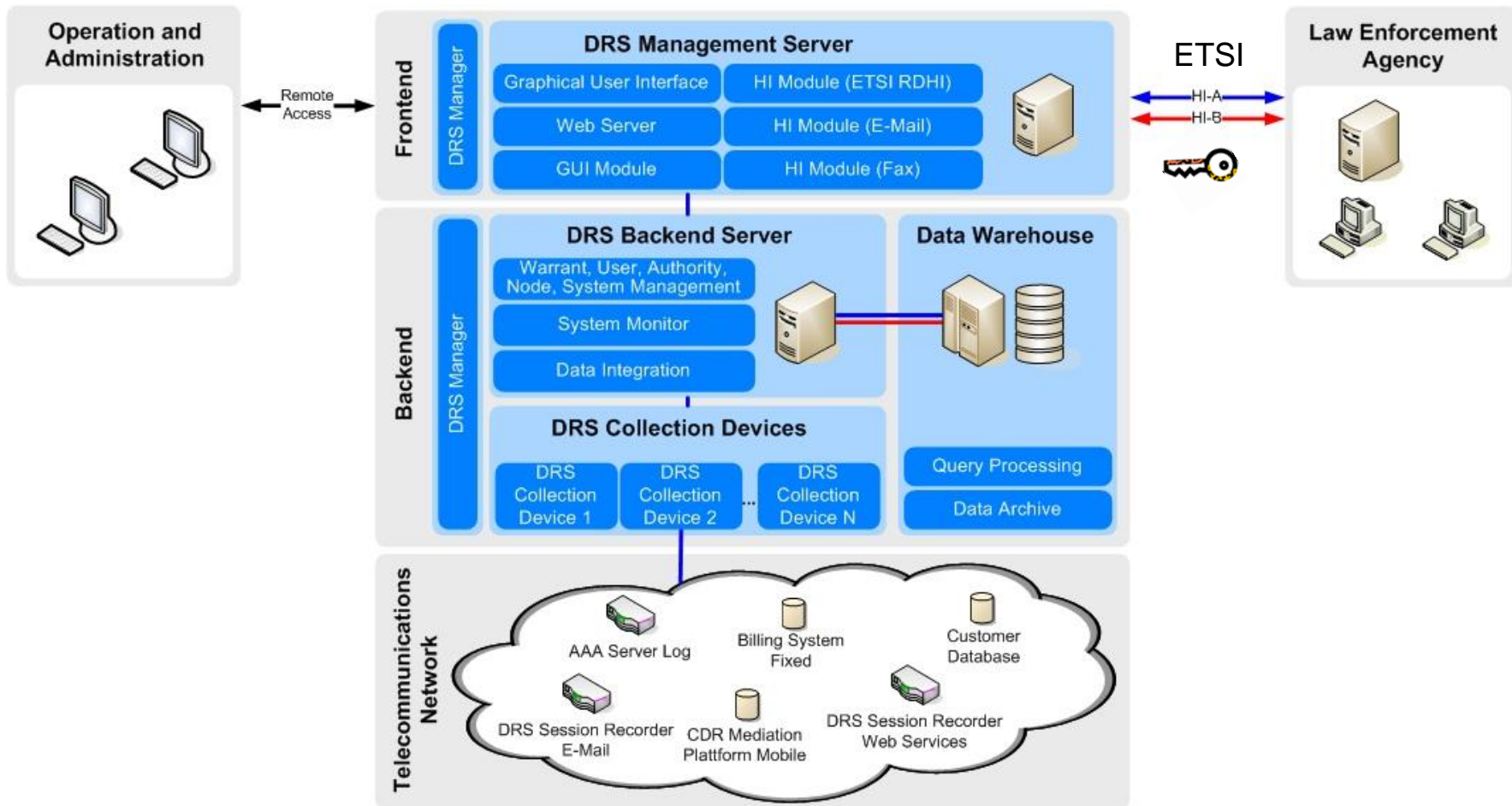
Operators must respond to **dozens and hundreds of requests per day** with ‘undue delay’ while there is no common request format and interface between law enforcement agencies and the operators. Yet operators must validate each request against **various laws** for data protection and public safety.

Utimaco Data Retention Suite

Design goals

- ▶ Automated workflows for warrant management and request processing
- ▶ Cost-effective HW&SW
- ▶ Carrier-grade architecture (availability, security)
- ▶ Optimized and compressed storage of billions of small records
- ▶ Very fast search
- ▶ Smooth integration into existing networks
- ▶ Scalable for small and large operators
- ▶ Compliant to national legislation

Utimaco Data Retention Suite Overview



Features

Collection

- ▶ Collects CDR and subscriber data from different sources
- ▶ Provides mediation (integration, correlation, normalization, reduction) to universal data format
- ▶ Supports various data formats and protocols from
 - ◆ CDR mediation systems
 - ◆ Billing systems
 - ◆ switches, routers
 - ◆ AAA servers, e-mail servers
- ▶ Remote queries at available databases (at search time)
- ▶ CDR generation by passive probes

Features

Storage

- ▶ Central storage of all CDRs and subscriber data in a universal format
 - ◆ per service
 - ◆ per operator/network
 - ◆ encrypted
- ▶ Column-wise organization of data
 - ◆ Each data field = one column
 - ◆ Optimized for queries (not for transactions)
 - ◆ Column data can be compressed (typically 40-80% depending on cardinality and data type)
 - ◆ Optimized indexes per data type (per column)
 - ◆ Less disk I/O for searches – only relevant columns must be searched
→ much faster search times than traditional databases
- ▶ Optional integration of available databases; e.g. subscriber database

Features

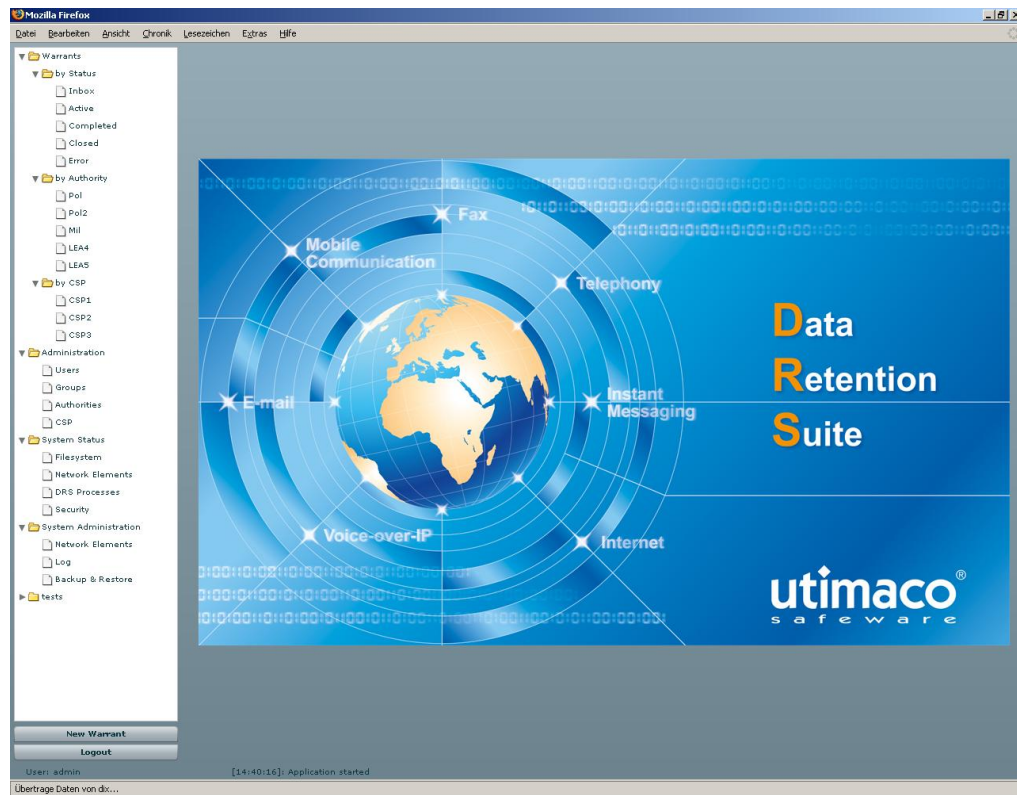
Administration

- ▶ Secure web-interface (https)
- ▶ Automated warrant processing
 - ◆ Receive warrants over electronic interface
 - ◆ Import request details (ETSI RDHI)
 - ◆ Translate request into database query
 - ◆ Deliver results
 - ◆ Archive warrant documents
- ▶ Comprehensive user management
 - ◆ Segregates user roles by different access rights (admin, operator, auditor, ...)
 - ◆ Separates tenants (operators/networks, authorities)
 - ◆ Enables hosted service models, supports MVNOs

Features

Administration cont'd

- ▶ Authority management
- ▶ Node management
- ▶ Alarm monitor
- ▶ Full audit trails of all user system events
- ▶ Accounting for billing to authorities
- ▶ System administration



Features

Delivery

- ▶ Electronic interfaces to law enforcement agencies (in & out)
 - ◆ ETSI interface (IP interface)
 - ◆ Fax interface
 - ◆ Email interface
- ▶ Export of reports in various formats
(*.csv, *.pdf, ETSI ASN.1, ETSI XML)

System configurations

▶ **DRS Small**

- ◆ Single X64 server, Sun Solaris 10
- ◆ <10Mio CDRs per day
- ◆ Integrated disks, 1.5 TByte net, RAID-Z

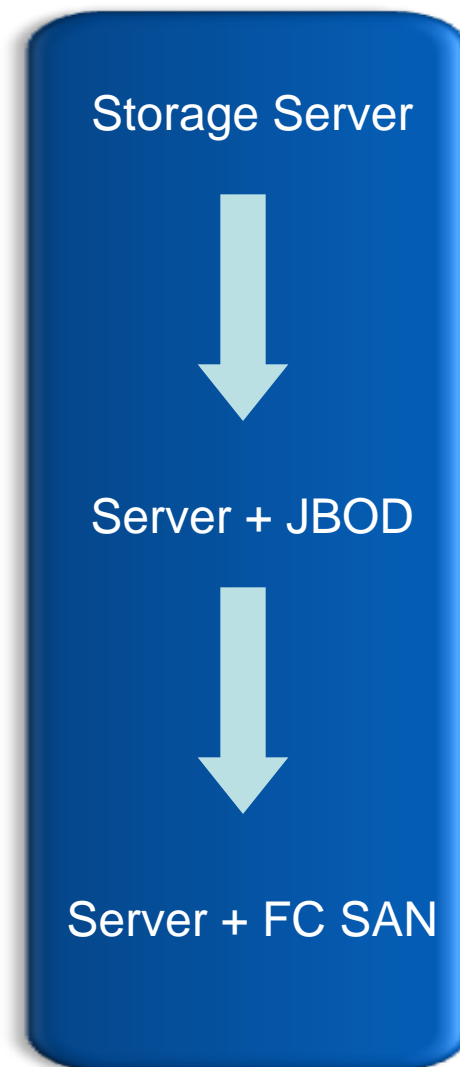
▶ **DRS Medium**

- ◆ Two X64 servers, Sun Solaris 10
- ◆ <50Mio CDRs per day
- ◆ JBOD storage, RAID-5, 4-48 TByte

▶ **DRS Large**

- ◆ 3-4 X64 servers, Sun Solaris 10
- ◆ 150Mio - 1Bill CDRs per day
- ◆ SAN, fiber channel, RAID-5, 21-112 TByte and more

▶ Customized configurations



Proof-of-Concept

▶ Performance Test

- ◆ Retention of 37 billion data records (100-500 byte each)
- ◆ Load performance of up to 390.000 records per second
- ◆ Compression rate between 41% to 83% dependant on service
- ◆ Response times for typical search queries 1.2 to 5 seconds

Utimaco DRS

Key Features & Benefits

- ▶ **Central management of all requests for retained data**
 Benefit: Easy of use, high automation, low OPEX, strong security

- ▶ **Modularity and scalability**
 Benefit: Cost-effective integration in existing networks of any size with various communication services, low CAPEX

- ▶ **High performance for load and search**
 Benefit: Suitable for large networks with several billions of CDRs per day

- ▶ **Granular user and security management, multi-tenant capability**
 Benefit: Strong data protection as required by law, suitable for multi-provider networks and hosted service models

Demo

▶ Please visit us at booth no. 5 from Thursday to Friday


The screenshot displays the Utimaco Safeware application interface within a Mozilla Firefox browser window. The main window shows a 'Warrants (active)' table with columns for Request ID, Authority, CSP, Status, Begin, and End. A sidebar on the left provides navigation options like 'by Status', 'by Authority', and 'Administration'. A 'New Warrant' dialog box is open, showing fields for Request ID, Warrant Date, and search criteria. A 'Login' dialog box is also visible, with fields for Username (admin) and Password (***). A smaller window in the foreground shows the 'DRS Users' table with columns for Username, Realname, Status, Created, Last Login, and Host.

Request ID	Authority	CSP	Status	Begin	End
DEmil555444333			active	2008-08-08 00:00:00	
DEmil111111133			active	2008-05-05 00:00:00	
49MIL666			active	2008-04-15 00:00:00	
DEpol8888555			active	2007-04-30 00:00:00	
DEpol26435			active	2008-09-15 00:00:00	
DEpol212345321			active	2008-09-15 00:00:00	
DEmil1234522			active	2015-05-31 00:00:00	
DEmil1111122			active	2008-09-15 00:00:00	
DEmil49MIL666			active	2008-04-08 00:00:00	
DEpol12222233			active	2008-09-15 00:00:00	
DEmil54922			active	2008-09-16 00:00:00	
DELEA2123456			active	2008-09-14 00:00:00	
DELEA2123456			active	2008-09-16 00:00:00	
49LKA12345679			active	2008-04-21 14:34:52	
DEpol555555			active	2008-09-01 00:00:00	
DEpol55555			active	2008-09-03 00:00:00	
DEpol55555			active	2008-09-02 00:00:00	
49LKA12345679			active	2008-04-21 14:34:52	
DEpol5555			active	1970-01-01 00:00:00	

Username	Realname	Status	Created	Last Login	Host
admin	John Doe	active	2007-01-01 15:23:00	2008-09-15 20:09:10	10.11.12.13
mark	Mark D.	active	2008-01-01 12:55:00	2008-09-15 20:09:10	10.11.12.13
rene	Rene H.	active	2008-03-01 15:23:00	2008-09-12 13:29:20	10.11.12.13
stefan	Stefan L.	active	2008-01-01 16:11:21	2008-09-10 12:19:34	10.11.12.13

Data Retention Suite

utimaco® safe ware



thank you!
děkuji!
gracias!
ВЫ!
merci!
tacka dig!
grazie!
dank u!
σας ευχαριστούμε!
danke!

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