

Comparing Alternatives

Traditional approaches to store and query CDRs, relies on a combination of mediation systems, storage, data warehousing, and Relational Database Management System applications. These approaches are not optimized for efficient long-term (multi-month/years) analysis and storage of millions/billions of daily CDR records. In order to achieve acceptable insert and query performance, traditional approaches require much greater investments in database software, high-end server systems, and massive data storage appliances – as well as administration resources.

Comparison Metrics

As the POC illustrates, the SenSage / EMC joint solution offers a viable and cost-effective approach. The following table generally compares the SenSage / EMC solution for addressing EU Data Retention Directive obligations versus that of traditional CDR management methods that would utilize a traditional Relational Data Base Management System (RDBMS) -based approach. The SenSage/EMC approach offers substantial cost advantages derived from (1) substantially less storage space, (2) substantially cheaper commodity hardware, and (3) much less personnel management expenditures. Additional benefits are found through simple expansion and purpose-built components.

	SenSage / EMC	Traditional	SenSage / EMC	Traditional
<i>Annual raw CDR Data</i>	Medium Telco Directive Application		Large Telco Directive Application	
<i>Daily raw CDR Data</i>	100 Million Records		800 Million Records	
<i>Storage Resources</i>	0.5x compressed 4-5 TB	10x RDBMS expansion 90-100 TB	0.5x compressed 35-40 TB	10x RDBMS expansion 700-800 TB
<i>Annual Labor Costs</i>	1 system admin.	1 system admin. 1+ Database admin. 2-4 Storage admin.	1 system admin.	1 system admin. 4+ Database admin. 4-6+ Storage admin.
<i>Solution Cost</i>	\$.85M - \$1.5M	\$5M - \$10M	\$2M - \$3M	\$20M+
<i>Expansion</i>	Simple; add SenSage servers, add Centera nodes	More complex; re-design, analyze, deploy and tune	Simple; add SenSage servers, add Centera nodes	More complex; re-design, analyze, deploy and tune
<i>Insertion and Query Performance</i>	Fast; Consistent query rate, no "tuning" required	Fast; Tune RDBMS indices, Add more systems	Fast; Consistent query rate, no "tuning" required	Fast; Tune RDBMS indices, Add more systems

Note: Comparative data source benchmarks derived from the Transaction Processing Council, TPC-H 3TB & 10TB with <http://www.tpc.org/tpch> and additional assumptions based on SenSage "Event Data Management Dilemma" Whitepaper.

Total Cost of Ownership

The joint SenSage / EMC solution provides optimized CDR data lifecycle management for the purpose of achieving Directive compliance objectives. Both the SenSage / EMC joint solution and that of a traditional approach rely on interfacing with existing mediation systems. However, as the volume of data to be managed and as the degree of ad hoc query complexity grow, achieving adequate CDR data insertion and query performance using a traditional approach will require greater ongoing administration and design considerations. This would include maintaining the RDBMS application (e.g. adjusting indices and adding new systems) and tuning the system infrastructure.

SenSage compresses the CDR data, yet the entire data set is available and online for immediate analysis. This results in lower storage resource and administration requirements. Leveraging EMC Centera's lower cost per managed TB storage further reduces the overall storage capacity and administration expenditures. SenSage and EMC Centera also provide readily convenient expansion options to increase analysis and storage capacity.

The SenSage / EMC Solution as illustrated by the POC provides lowest possible cost for Telcos and ISPs to support EU Data Retention Directives. The key factors contributing to reduced expenditure include:

- Use of low cost, commercially available servers.
- Purpose-built analytic repository that negates RDBMS technology or licensing.
- Consistent system load and query performance that avoids RDBMS expertise, administration and tuning.
- Reduced stored data requirements using compression that does not affect access or query capabilities.
- Lower cost per managed storage in a storage solution that supports high availability and compliant retention.
- Flexible support for Telco mediation sources.
- Event data management and storage management that supports convenient capacity expansion.
- A data segmented, self-contained system with direct compliance controls and manageability.

Conclusion

The joint SenSage / EMC Proof of Concept demonstrates that the joint SenSage / EMC solution can integrate with existing Telco mediation systems and CDR data sources. The solution efficiently and cost-effectively manages massive volumes of CDR data and can well accommodate IP access and messaging data. CDR data is maintained in a segregated and tamper-proof repository, which provides appropriate access controls, data redundancy, data integrity and data availability required by the Directive. The solution achieves data access and analysis results that can meet the standards of "without undue delay." Furthermore, the solution can be expanded to meet evolving requirements, increased volume and new data sources.

The solution, as collaborated by SenSage and EMC, offers European Telcos and ISPs a viable, proven and cost-effective approach to address EU Data Retention Directive obligations. It enables law enforcement authorities to quickly access, investigate and prosecute terrorists and serious crime activity derived from phone and Internet records. It also enables telecommunications and Internet service providers the means to efficiently manage, retain and analyze enormous volumes of commutations records and validate adherence. Given that the EU Data Retention Directive adds to a Telco's and ISP's cost of doing business, the joint solution offers significant cost savings when compared to that of traditional approaches,

POC Solution Components

SenSage, Scalable Event Data Management

ESA-2000
20 SLS Server Cluster

Dell, Enterprise-class Servers

20 Dell PowerEdge 2950 Servers
2x Xeon 3.0 GHz 2x-Core, 4MB L2 cache, 4GB Ram
Dual Gig3 NICs, PERC 5 RAID Controller
(2) 142GB SCSI Drives, RAID-0 configuration

RedHat, Linux Operating Platform

RedHat ES 4 Linux.
Update 4, x86-64 (64-Bit)

EMC Centera, Content Addressable Storage

EMC Centera Gen 4
16 Nodes, 6 Access Nodes (320 GB drive configuration)

Intel, High Performance Processors

Intel Dual-Xeon 3.0GHz CPU, Dual Core
(aka Woodcrest)

Intec Telecom Solutions

Mediation and POC solution guidance

Cisco, Intelligent Switch

1 Coscp Catalyst 3750 Switch
24-ports, 36 Gbps backplane

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