APPLICATION NOTE

Applying information lifecycle management

Using reference architectures to ease the implementation of information lifecycle management

MAY 2004

1 Executive summary

StorageTek® reference architectures can be used to ease the implementation of information lifecycle management in today's data environments. These architectures provide a proven framework for applying information lifecycle management (ILM) principles to materially enhance existing storage infrastructures, increase utilization of existing assets and improve management productivity. Reference architectures are available for Open Systems archiving, mainframe archiving and Open Systems data protection.

2 The challenge

The value of information is never static. Data that is critical when it is created can lose much of its importance within days. A data management strategy — and a complementary IT architecture — is needed to align the costs of storage with the value of information. StorageTek's information lifecycle management architectures meet these needs. These reference architectures can help calm the chaos of rapid data growth in a cost-effective manner.

Information lifecycle management is not just another data storage solution. It's not a piece of hardware or software. It is a value-based approach to assessing and managing a company's collective information holdings — one of the most valuable assets a business possesses. It is based on how data is used and how readily available it must be to the people who use it. ILM is all about information's business value.

Under this approach, the business value of data determines the design and use of the storage infrastructure. When the business value of data is high, it makes sense to keep the data immediately accessible. When data no longer contributes to daily business operations, it's practical to automate movement of the information to a less expensive storage infrastructure.

In some industries, legal requirements and compliance issues require extended data retention.

An ILM strategy can be structured to take these requirements into account. Regardless of a company's specific circumstances, information lifecycle management provides practical methodologies for aligning storage costs with statutory and regulatory requirements.

3 StorageTek's reference architectures

StorageTek's information lifecycle management reference architectures provide a validated benchmark for achieving the benefits of managing data across each phase of its existence. The architectures are designed, built and tested in StorageTek labs. They bring together diverse storage hardware, networking devices, intelligent software and professional support services.

These architectures provide a value-based, tiered approach to storage that makes optimal use of storage resources. They provide the structure needed to:

- Minimize the budget risks of designing, implementing and managing a solution — providing a map that identifies the right place to start
- Leverage StorageTek's 30 plus years of storage expertise to design and integrate best-in-class storage infrastructure
- Reduce interoperability testing costs associated with developing a storage solution
- Integrate existing assets and technologies into the design — because the architectures are not closed models for implementation

StorageTek's information lifecycle management architectures are available for Open Systems archiving, mainframe archiving and Open System data protection.

4 Open Systems archiving architecture

StorageTek's Open Systems archiving architecture provides a benchmark for managing, replicating and storing data housed in distributed systems. This architecture positions an organization to efficiently handle rapidly growing volumes of data from e-mail applications, business systems and other data-intensive applications.

The Open Systems archiving architecture supports the automated solutions an organization may need to meet legal and regulatory requirements for retaining e-mail and other critical information — for example, patient health data. This architecture helps IT staff protect data at an appropriate level for the required length of time.

4.1 Applying the architecture

At a large manufacturing corporation, an SAP application handles payroll processing. The payroll application requires the highest availability and performance, so the data for it is stored in either StorageTek's D280 disk system or V2X Shared Virtual Array® (SVA™) disk system. Every two weeks, employee work time and vacation records are retrieved from disk.

StorageTek protects the information continuously via high-availability network connections between the SAP servers and the disk, and by making instantaneous copies of data every two hours with SnapShot software. Replication tasks are performed non-disruptively and without using additional physical storage.

At the end of the pay period, the information is migrated from the higher-priced, higher-performance disk to to mid-range BladeStore ATA disk with Application Storage Manager® (ASM) software.

At this stage, users can access their personal payroll data from the company's Web site for a period of three months. Although the payroll data has been migrated, users notice little difference in the Web site's response time.

After three months, information is automatically written to an L180 tape library, which is located on the same campus as the data archive. The use of safe, tape-based storage meets the HR department's requirements for accessing data and the accounting department's requirements for protecting data. For additional disaster recovery protection, data is replicated to a remote location, where it is stored on an L700e tape library.

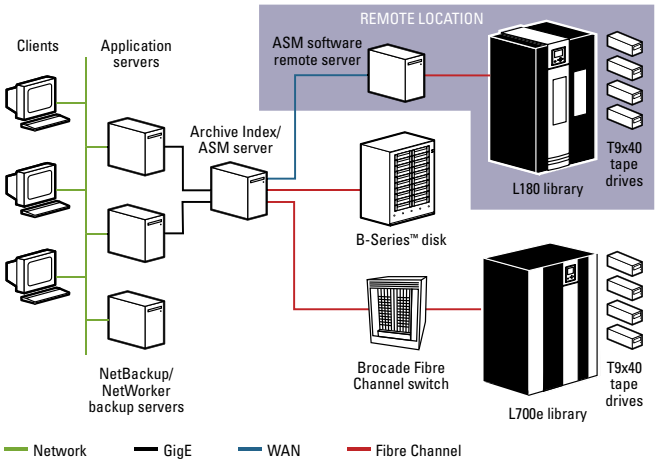

Figure 1. Open Systems archiving architecture.

5 Mainframe archiving architecture

StorageTek's mainframe archiving architecture supports solutions for automatically administering mainframe data over time. Intelligent data management software enables a business to set policies for the automatic migration, retention and deletion of data.

This architecture helps calm the chaos of runaway data growth and stringent storage requirements by eliminating inefficient processes and simplifying management tasks. This is accomplished by making optimal use of StorageTek tape libraries, storage management software and professional services.

5.1 Applying the architecture

A large insurance company was challenged with managing one petabyte of enterprise data. Growth of the insurance company's business was especially high for a four-month period, during which tape storage grew at a rate of 5,000 new 3490 cartridges every two weeks. Floor space in the company's data center was limited.

To stem the rising tide of tape cartridges, the insurance company implemented StorageTek's Virtual Storage Manager® (VSM®) system and 9840 tape cartridges. Use of the VSM system and 9840 technology greatly reduced the need for tape cartridges. Without this technology, the insurance company would have had to make room for 250,000 more cartridges, more tape drives and more tape silos in the same four-month period.

In the future, the insurance company intends to move the majority of its tape storage to the VSM system environment. Even for larger data sets, the insurance company intends to use VSM system rather than additional native tape drives. The VSM system will allow the insurance company to write large data sets to native tape and fill them effectively.

Human resources data — aligning storage with data

Data	Current payroll period data	Past three months of payroll data	Payroll data history	Payroll data history
Value	Payroll processing	Employee Web access	Legal and financial archive	Disaster protection
Storage	D280 disk system (mirrored)	BladeStore disk system	L180 tape library (local)	L700e tape library (remote site)
Data migration	SnapShot software copy	Archive software, ASM software	ASM software	ASM software

Mainframe archive — aligning storage with data

Data	Active transaction database	Transactions aged 24 hours	Transactions aged 50 days to three years	Transactions aged 50 days to three years
Value	Transaction collection and processing	Short-term access	Historical transaction archive	Disaster protection
Storage	Mainframe disk (mirrored)	VSM system disk buffer	PowderHorn® 9310 tape library (local)	PowderHorn 9310 tape library (remote site)
Data migration	DB2	VSM system	VSM system	VSM system

While the VSM system has reduced the need for more physical tapes, it has also enabled the insurance company to automate labor-intensive processes. The insurance company is down to one operator per shift, and it hopes that the VSM system will eventually allow "lights off" operation.

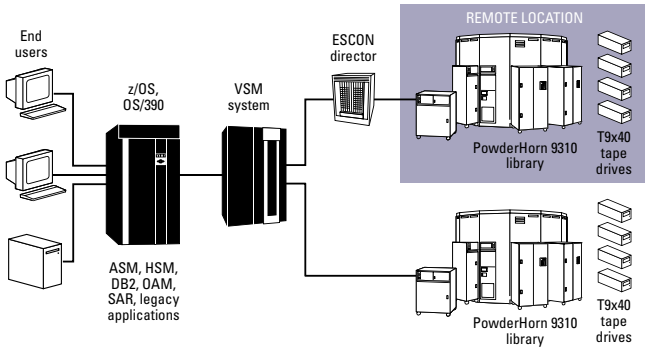

Figure 2. Mainframe archiving architecture.

6 Open Systems data protection architecture

StorageTek's Open Systems data protection architecture helps an organization keep rapidly growing volumes of data safe and accessible. It includes capabilities for continuous point-in-time recovery, failover and business continuity solutions.

This tested architecture is designed to make optimum use of disk, tape and software resources to support the three levels of data protection — backup and restore, replication, and disaster recovery. It brings together data protection appliances, tape libraries, disk systems, storage management software and professional services.

6.1 Applying the architecture

A hospital needed a high-capacity, tiered storage solution to automate the management and protection of rapidly growing volumes of imaging data. Working with a PACS (Picture Archive and Communications System) solution provider, the hospital found an ideal storage solution for their PACS: A combination of StorageTek disk, tape and software products.

The solution uses a D173 disk system for primary storage, a BladeStore disk system for secondary storage, tape drives and an L40 tape library for backup and disaster recovery, and Application Storage Manager® (ASM) software for automated data management.

Patient files, such as X-rays and MRI and CT scans, are stored initially on primary disk, for highest availability, and mirrored on the BladeStore disk system. They are simultaneously written to tape for backup and disaster recovery purposes.

The system automatically mirrors and replicates data, maximizing recovery if an unplanned event occurs. It gives the hospital's medical staff faster access to patient X-rays and related studies, such as MRI and CT scans. And it eases the burden on IT staff by automating the data-migration process.

Open Systems data protection — aligning storage with data

Data	Newly captured patient imaging studies	Mirrored patient imaging studies	Backup copies	Disaster recovery copies
Protection level	Fastest data access for medical staff	Continuous data protection	Quick restore of data	Protects against unplanned events
Storage	D173 disk system	BladeStore disk system	L40 tape library (local)	L40 tape library (remote)

7 The opportunity

The use of proven reference architectures can deliver the benefits of information lifecycle management in less time. They can help an organization achieve the following results:

Simplify data management — Set policies for the automatic migration, retention and deletion of data throughout its life — so data is always in the right place at the right time.

Reduce disk cost — Optimize and minimize the use of valuable disk space by moving less active data to lower-cost disk alternatives or automated tape, while still providing fast access to information.

Use information efficiently — Match performance needs with storage options. Provide the fastest access to data that is most needed by users.

Protect data appropriately — Match data value to protection options. Use the highest levels of protection for the most valuable information.

Support regulatory compliance — Keep the right data over time by matching legal, compliance and business continuance requirements to the appropriate archival options.

Support user needs — Maintain service level agreements and increase data center control by matching data requirements to service options.

StorageTek is uniquely positioned to help an organization meet its goals for managing data in a manner that reflects its changing value. StorageTek can provide the wide-ranging storage hardware, networking equipment, software and professional services necessary for a complete information lifecycle management architecture — from assessment and design through deployment.

For ongoing care, StorageTek's TekCare™ Support Services and Enterprise Support Services (ESS) teams provide support for hardware and software from StorageTek and more than 1,800 other vendors. Additionally, StorageTek's Remote Managed Storage Services provide remote monitoring, reporting and management of storage environments.

7.1 A holistic approach

Along with leading storage technologies, support services and professional services, StorageTek brings a holistic approach. The StorageTek team is ready to help customers design, implement, manage and support a strategic solution that works with an entire storage ecosystem.

With StorageTek's information lifecycle management reference architectures, customers gain the benefits of more than 30 years of storage experience and a proven approach. These are architectures that have been thoroughly tested in real-world data environments. All of this means less cost and and a more efficient data center.

ABOUT STORAGETEK®

Storage Technology Corporation (NYSE: STK), a $2 billion worldwide company with headquarters in Louisville, CO, has been delivering a broad range of storage management solutions designed for IT professionals for over 30 years. StorageTek offers solutions that are easy to manage, integrate well with existing infrastructures and allow universal access to data across servers, media types and storage networks. StorageTek's practical and safe storage solutions for tape automation, disk storage systems and storage integration, coupled with a global services network, provide IT professionals with confidence and know-how to manage their entire storage management ecosystem today and in the future.

StorageTek products are available through a worldwide network. For more information, visit www.storagetek.com, or call 1.800.275.4785 or 01.303.673.2800.

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