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The Network is the Computer™

Extend Disaster Recovery with Sun StorageTek™ Virtual Storage Manager® System and McDATA UltraNet Channel Extension Solutions

Solution Synopsis

The Sun StorageTek™ Virtual Storage Manager® 5 (VSM 5) system is the leading virtual tape solution for large-scale mainframe data protection infrastructures. Offering unmatched scalability, cost control, and availability, VSM 5 delivers the industry's most flexible approach to disaster recovery. Using FICON® for high-speed connectivity, VSM 5 supports centralized control and configuration of multiple virtual tape subsystems, disk arrays, and automated cartridge systems (ACS), eliminating the potential for single points of failure. The McDATA UltraNet® channel extension solutions enhance the data protection advantages of VSM 5 by providing high-speed FICON connectivity over long-distance IP networks. This combined Sun McDATA solution eliminates distance as a barrier to greater business continuity.

Eliminating the Single Point of Failure

Virtual tape solutions are revolutionizing the enterprise data protection infrastructure, allowing cost-saving efficiencies and backup and recovery scalability and performance improvements unavailable using traditional physical tape alone. By emulating conventional tape devices with disk storage, the virtual tape library improves backup and recovery performance, eliminates hardware contention, and supports dramatic efficiency improvements through the consolidation and optimization of physical resources.

A virtual tape solution functions as a front-end to the physical tape infrastructure, buffering backup data on disk before combining data sets for efficient storage on physical tape cartridges. RAID disk arrays provide a measure of safety against data loss, however, as the trusted recipient of critical application backup data, a virtual tape solution must offer full redundancy to eliminate all potential single points of failure in the data protection infrastructure.

A Disaster-Tolerant Virtual Tape Solution

No two organizations take the same approach to business continuity. This means that the most important aspect of any virtual tape solution is support for flexible disaster recovery configurations.

> **Combining VSM 5 and the McDATA UltraNet platform allows components of the virtual tape infrastructure to bridge almost unlimited distances between enterprise data centers.**

For the largest organizations, where downtime is measured in hundreds of thousands of dollars per minute, geographically dispersed data centers offer the highest level of business continuity, guaranteeing users access to critical applications from multiple locations. A virtual tape solution must support these sophisticated multi-location approaches to business continuity (see Figure 1).

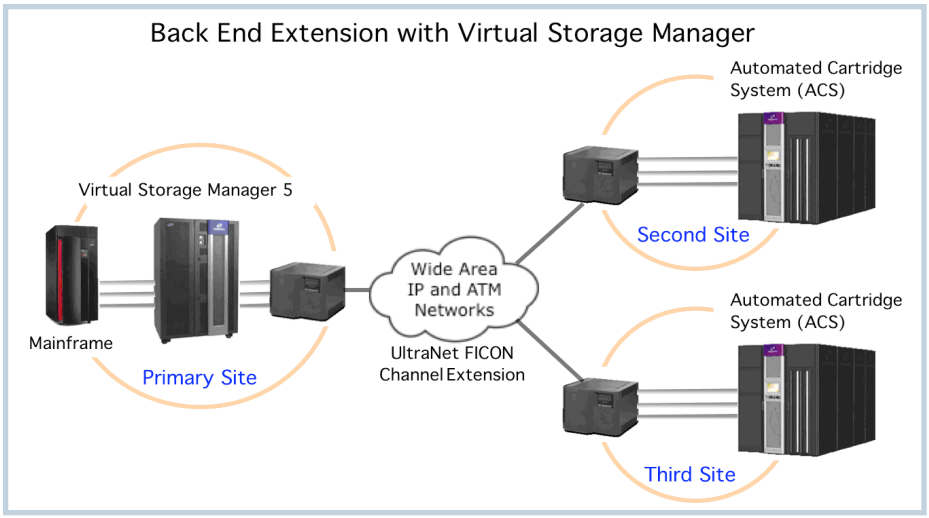

Figure 1: Sample multi-site disaster recovery configuration.

Whether allowing multiple copies of virtual volumes to be written to different physical tape drives in different physical locations; supporting a geographically dispersed network of virtual tape controllers, disk arrays, and ACS; or supporting virtual tape solution clustering between local and remote data centers, it is critical that business continuity capabilities not be restricted by distance.

In addition, at the most basic level, techniques used by the virtual tape solution to efficiently consolidated backup data sets on physical cartridges must be independently reversible. This will allow operations staff access to backup data even if the virtual tape solution front-end is unavailable.

The Sun StorageTek™ Virtual Storage Manager® and McDATA UltraNet™ Platform

VSM 5 is the latest generation of the market-leading virtual tape solution for mainframe environments from Sun. A building block in the Sun mission to "Virtualize Everything," VSM 5 dramatically simplifies enterprise data management, providing a virtual disk buffer for tape data and policy-driven migration to back-end physical tape devices.

Offering unmatched scalability and manageability, VSM 5 provides a single point of control for up to 256 virtual tape storage subsystems (VTSS), each of which supports up to 256 virtual tape drives (VTD) and an unlimited number of virtual tape volumes (VTV). Substituting virtual drives for physical, VSM 5 is able to eliminate tape drive contention, allowing more backup jobs to run concurrently and resulting in a much shorter backup window.

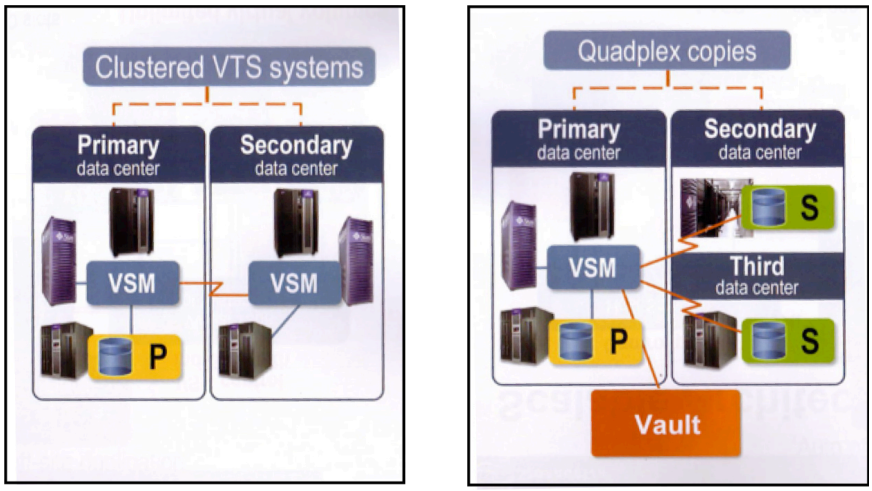

Figure 2: Sun StorageTek™ Virtual Storage Manager® clustering and quadraplexing configurations.

With a disk buffer than can grow to 28TB, VSM 5 is able to improve the performance of both backup and recovery processing. Compression and volume stacking capabilities optimize physical cartridge use, dramatically reducing media consumption. And, a smaller footprint in the data center and automation through user-defined policies, allow VSM 5 to significantly lowers capital and labor costs.

Among the most important advances offered by VSM 5 is the ability to provide a flexible approach to disaster recovery. Supporting FICON for connectivity to two mainframe servers and downstream physical tape resources, VSM 5 accommodates a variety of different configurations, including bi-directional clustering for high-availability.

Each VTSS managed by VSM 5 supports up to four ACS, and each ACS can be located in a different data center. Policies determine when a disk-based VTV is written to physical tape, the type of tape resource used—access- or capacity-centric—and the location of the ACS receiving the data. Support for virtual quadraplexing enables up to four copies of data to be written to different physical cartridges, providing protection against tape drive, library, and media failure. And, a wide variety of different utilities, designed to support disaster recovery and testing, ease the administration of the virtual tape solution.

Extending FICON Connectivity

FICON plays an important role in the disaster recovery capabilities of VSM 5. Each component of the infrastructure is connected by FICON channel attachment, and although this can provide high-speed, 2Gbps communication between mainframe, VTSS, disk arrays, and physical tape devices, distance restrictions limit disaster recovery flexibility.

The McDATA UltraNet platform compliments the VSM 5 architecture by extending FICON channel connectivity beyond the conventional 100 kilometer limit of the protocol. Providing high-speed emulation of the FICON protocol over conventional long-distance IP and ATM networks, the UltraNet platform is able to connect devices separated by thousands of miles (see Figure 3). Combining VSM 5 and the McDATA UltraNet platform allows components of the virtual tape infrastructure to bridge almost unlimited distances between enterprise data centers.

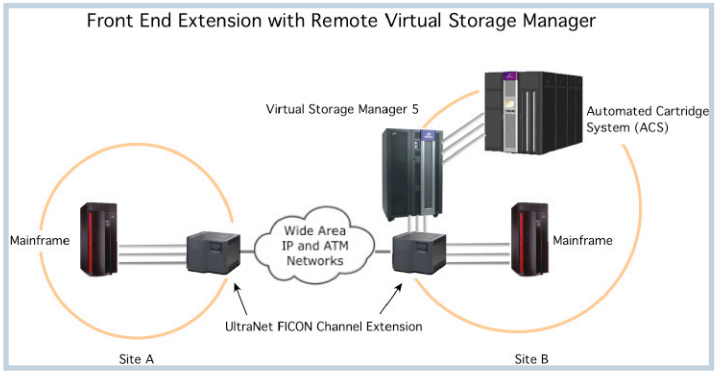

Figure 3: Sample front-end extension configuration using long-distance FICON emulation.

The UltraNet platform emulates channel, control unit, and devices in the FICON network to minimize interruptions to the flow of data over the extended connection. Configurable intelligent compression routines dynamically analyze network traffic for repetitive patterns, as data passes across the ports of the UltraNet platform. Compression rates are transparently and incrementally adjusted to maintain maximum network speeds at all times.

Payload Matching provides another technique for reducing network traffic by ensuring that each data packet on the extended network carries the optimum amount of data. The UltraNet platform uses data buffering and blocking techniques to eliminate performance degrading inefficiencies during conversion and maximize the Ethernet link payload capacity.

McDATA and Sun: Supporting Long-Distance Business Continuity

The extended high-speed FICON connectivity offered by the McDATA UltraNet platform provides a perfect compliment to the virtual tape technology of the Sun StorageTek Virtual Storage Manager 5 system. Together, these solutions deliver scalable performance and capacity, and cost saving consolidation for the enterprise data protection and networking infrastructures. And, by eliminating distance as a barrier to business continuity, technologies from Sun and McDATA are building greater resilience in the enterprise IT infrastructure.

The McDATA and Sun Benefits Summary

DBA requirement	Benefits
Improve Tape Infrastructure Scalability	• Up to 28TB high-speed disk buffer to speed backup and recovery processing • Up to 256 virtual tape drives and unlimited virtual tape volumes for each VTSS eliminate physical tape drive contention forever • Reduce backup window
Availability	• Automate multi-site remote vaulting, including quadraplexing, over high-speed extended FICON connectivity • Fast read and write to remote FICON-attached devices delivers near local tape drive performance • Bi-directional Clustering over Wide-Area Network to eliminate all single points of failure
Manageability	• Streamline multi-site tape operations with single point of control • Automate remote operations and reduce physical tape mounts • Reduce manual intervention in tape infrastructure with policy-driven automation
Lower Total Cost of Ownership	• Consolidate physical tape infrastructure and dramatically reduce cartridge count • Reduced tape infrastructure footprint provides more room in overcrowded data centers • Virtualize existing physical infrastructure to leverage current investments

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