



Tape Consolidation in the Data Center — STK: Ready, Willing, and Very Able

Analyst: David Reine

Management Summary

The motto of the Boy Scouts of America is *Be Prepared*, which is exactly what a Scout tries to be whenever he goes camping. He takes along every tool that he could possibly need to set up a camp and live in the woods. He could need a can opener, a bottle opener, a knife, fork, and spoon. He could bring along a screwdriver, perhaps one with a Phillips head, and a scissors. He might even need a nail file, a wood saw, and some tweezers to remove a splinter left from using the wood saw. He might also want to carry a corkscrew, in case the scout leader forgot his. In addition, of course, a toolbox to carry all of the tools in when he runs out of pockets! On the other hand, he might want to bring along a single Swiss Army Knife that can solve all of your camping problems and fit in your pocket to conserve space in the scout's backpack.

Like the good Boy Scout, **the CIO of your enterprise needs to be sure that his data center is prepared to support any mission-critical storage requirement.** In addition, he might need to implement a consolidation plan to reduce costs or to conserve space, or a disaster recovery program, in addition to a mandatory backup and recovery program. He needs to prepare for, and implement, every Information Lifecycle Management (ILM) initiative that senior management requires in order to comply with industry practices and federal regulations and to stay out of jail. Part of that preparation includes reviewing the disparate tape solutions that have been implemented, not only in the data center, but also throughout the enterprise. With an inventory of T9840 and T9940 cartridges in the data center, and a like number of DLT and LTO cartridges from supporting a variety of open systems UNIX and Windows servers, the CIO has to be ready to consolidate. The data center is responsible for the resources necessary to manage this network of disasters waiting to happen, and reduce the total cost of ownership. **The CIO must be able to handle unpredictable growth in data, but somehow accommodate it with a tight budget and head count. The data center must never be down, even for system upgrades.**

One solution now available is the *StreamLine SL8500 modular library* from StorageTek. Designed to support most of the legacy tape resources across the enterprise, the SL8500 is now ready to provide the data center with the ability to consolidate multiple libraries into one manageable system. It will save hundreds of square feet of floor space, and reduce your maintenance and management costs. In addition, STK can provide the ILM features you need to save on storage investment. To learn more as to how STK can reduce the cost of running your enterprise, please read on.

IN THIS ISSUE

➤ Today's Data Center Environment.....	2
➤ The Role of Tape in the Data Center.....	2
➤ The StreamLine SL8500 Solution.....	3
➤ Conclusion	4

Today's Data Center Environment

The demand for increasing amounts of data storage exists throughout the enterprise, but it is felt more in the data center. Industry standards and federal regulations require the retention of ever-increasing amounts of information. We thought that the burden placed on storage by accountants to protect the organization from the IRS was onerous. Now the enterprise faces rules and regulations established by the lawyers to protect senior management from stockholder lawsuits and indictment by the government for "misconduct". Laws such as Sarbanes-Oxley have instituted requirements to save financial data until long after its practical usefulness, in fact, for years after. Unfortunately, most IT staffs lack the basic tools with which to enable the migration of data from a primary storage platform when it is mission critical, to a secondary platform, **when the information is being retained just-in-case rather than just-in-time.**

Consequently, the Information Technology (IT) staff is experiencing an increase in the number of primary storage requests and an unprecedented growth in the most expensive storage in the data center. The IT requirements for storage have grown out of proportion to any forecast and the total cost of ownership of storage has grown faster than other components in the data center.

On one hand, the IT staff implements filters to control the spam that needlessly fills the enterprise's mailboxes. On the other hand, they are charged with improving the SPAM process for enterprise data, i.e., Store, Protect, Archive, and Manage. Everything that the CIO does must enhance at least one aspect of this storage process. Moreover, this is not a simple task, with the proliferation of a heterogeneous architecture spanning both the proprietary mainframe and the open systems (UNIX, Linux, and Windows) environments. Over the years, the data center staff has complemented the primary storage facility with a variety of on-line secondary storage products. In addition, IT has complemented the primary tape silo in the data center with a variety of cartridge libraries to support the open systems portion of the corporate

mission. This heterogeneous expansion has brought in a mixture of DLT and LTO tape drives and libraries in addition to the enterprise silo. It has increased the number, as well as the type, of cartridges to support. It has increased the management complexity, forcing the addition of human resources to manage the expanded physical resources.

The Role of Tape in the Data Center

The tape resources throughout the enterprise have been growing, seemingly without control. Department managers have acquired backup, data collection, and data protection solutions for specific applications that fall under their domain, and within their budgets. Unfortunately, the management of these resources can prove to be more than individual departments can handle, and **the responsibility, and cost, to manage them falls to the "glass house".**

The data center can thus inherit a heterogeneous mix of tape architectures that may or may not be consistent from one department to another. They most certainly are not consistent with the silo supporting the enterprise's mission critical applications. In order to control costs, the CIO needs to develop a consolidation plan that will be flexible enough to protect the investment made in legacy drives and cartridges. This plan must also allow for the inclusion of higher capacity drives that save space and faster drives to save time. This new solution must also be able to guarantee that information required by legislation cannot be altered once it has been saved. The consolidated solution must also be able to connect to the myriad of open systems computing resources already in place, as well as the enterprise mainframe. The new library must be a scalable solution in order to support the growth required by the transition of data from primary or secondary on-line storage to tape archive as part of the ILM process. The new solution must provide reliability, availability, and serviceability (RAS) to ensure a 24x7x365 environment, required by the mission critical applications. The CIO must also reduce the cost to maintain and manage the data center's tape resources.

The increase in the amount of stored data has necessitated a lengthening of the backup window because the staff can no longer back up the mission critical data in the allotted time. Moreover, the increase to the backup window has reduced the time available to the batch process resulting in overruns into prime time, conflicting with the on-line transaction processing requirements. This does not even address the time required to recover a lost file, which becomes longer and longer as the current situation worsens. This creates a sense of urgency to improve the management of the storage content and to improve the throughput for the backup and recovery procedures with faster drives in order to restore normal processing hours for on-line processing.

StorageTek is addressing these problems head on with the introduction of a new set of hardware and software products for the data center. The introduction is led by the *StreamLine SL8500 Tape Library* and *T9940B Tape Drive* with FICON connection, along with a pair of applications to improve the management of the data: *Lifecycle Director for IBM DB2* and *Backup Resource Monitor*.

The StreamLine SL8500 Solution

The centerpiece of STK's new announcement is the first offering in STK's newest family of modular library products, the SL8500 modular tape library. Designed to replace STK's legacy library products, the *4410*, *9310*, and the *L5500*, the SL8500 can support the *T9840* and *T9940* tape drives¹, configured with new hot-swap carriers. This protects the investment that IT has made in thousands of cartridges and preserves the information encoded on those cartridges. In addition, with added support for both SDLT and LTO, the SL8500 becomes the ideal vehicle for consolidation of the disparate tape resources throughout the enterprise.

The new *T9940B*² tape drive comes with FICON interface as well as ESCON and 2-

gigabit fibre channel. With it, STK can deliver a 200 GB tape cartridge with 10 times the capacity of the *T9840A/B* and three times the throughput of the *T9840A* in a traditional backup/restore environment. This will reduce both the number of cartridges required and the length of time needed to do the backup or recovery. In addition, the high capacity of the *T9940B* also enables the media to be used for data acquisition in scientific and high-performance computing environments that require a high duty-cycle reliability and faster access than commodity drives. It also enables archiving in an ILM architecture, to free up high performance disk for more active data.

It can even complete its tasks with a Write-Once-Read-Many (WORM) format that complies with the requirements for data preservation, as laid out in recent regulatory action. **The SL8500 thus becomes an effective tool for enterprise ILM activity as well as consolidation.**

A major requirement for any consolidation device is to be highly reliable and highly available. Not only will this library be supporting a variety of open systems servers, it will also be providing tape resources to all of the mission-critical applications running on the mainframe. With hot-swappable and fully redundant components, including multiple robots, the SL8500 has been designed to provide 24x7x365 reliability, availability, and serviceability. The IT staff can upgrade the library to add more drives or slots and to update the library microcode while in operation. In addition, the data center can monitor and manage the library either through a local panel or remotely, via a network-based operator console.

The SL8500 has been designed to reduce the total cost of ownership for the data center. With support for a heterogeneous mix of drives and cartridges, this scalable library can replace all of the other tape libraries in use throughout the enterprise. Moreover, the IT director can significantly reduce the total cost of ownership. He can limit the number of support personnel required to manage the tape environment, while saving money from the reduced environmental needs, lower mainten-

¹ The SL8500 does not support the older 18/36 track tape drives.

² See **The Clipper Group Explorer** dated May 7, 2004, entitled *Tape Drive Selection – A How-To Guide* at <http://www.clipper.com/research/TCG2004040.pdf>

ance costs, and the recovery of floor space from the replacement of older architectures.

With a base unit capable of holding about 1,500 cartridges, the SL8500 is extremely scalable, with the ability to grow to over 300,000 cartridge slots. These cartridges are supported by up to 64 drives in the base and up to 2,048 drives in a single modular library system. The SL8500 will support any mix of supported drives including T9840, T9940, LTO, and SDLT. Using SDLT 600 drives³, the base unit can support 434 TB of data with a throughput of 8.1 TB/hour. A single modular library, therefore, can store 90 PB of data with a throughput of 258 TB/hour. Since a consolidated storage solution will have to support hundreds or thousands of servers, the SL8500 also can be equipped with multiple robotics, working in parallel, to minimize queuing. The SL8500 supports both proprietary mainframe connections for ESCON and FICON, and open systems connections using fibre channel. It can replace all of your existing library resources and communicate with state of the art speed to the z/OS mainframe and all of your open systems servers using all major operating systems, including UNIX, Linux, and Windows.

New Software to Facilitate Data Transition

In addition, StorageTek has also announced a pair of software applications to support the transition of data between storage devices and to better manage the backup and recovery process: *Lifecycle Director Software for IBM DB2* and *Backup Resource Monitor*.

The Lifecycle Director for DB2 is aimed at relieving the pressure on primary disk arrays supporting IBM DB2, specifically by transitioning inactive data from an expensive primary storage facility to a less expensive secondary on-line facility or to tape. By migrating the storage off the primary device, the data center can save significant cost by releasing disk for current data and simplifying the backup process by archiving to tape. This also can improve on-line transaction performance by reducing the size of the tables to be searched.

The Backup Resource Monitor is a software application with the ability to collect data from all backup resources, to provide reports that can be used for resource planning, and to simplify backup system administration activities. The Monitor identifies exposed backup clients, reducing the risk associated with a backup failure, provides a single view from all components, and stays current with backup growth without manual intervention. This eliminates the requirement to add headcount to manage new backup jobs as the data center adds more servers/applications to its mix.

Conclusion

With a record of accomplishment of 12,000 tape libraries behind them, StorageTek knows what they are doing in the enterprise tape market. The StreamLine SL8500 was not designed to simply provide an upgrade path for legacy STK libraries. It was designed to enable the consolidation of tape resources within the enterprise similar to what IBM, HP, and Sun have been doing for years with servers. In order to reduce the total cost of operations, the data center must learn to do more with less. Fewer platforms reduce operational cost. **By consolidating multiple heterogeneous libraries within a single new architecture, the data center can protect the investment in legacy products while using new, faster technology to grow enterprise capabilities and manage costs.**

With the SL8500, STK has introduced a multi-platform library with increased RAS capability, superior throughput, and unmatched scalability to enable any enterprise to grow without concern for running out of the right tape resources. If your data center is struggling with the costs and overhead of managing an obsolete tape system, any CIO could look with confidence toward STK to provide a high performance, highly available solution with the SL8500.



³ The SDLT 600 can store 300 GB of uncompressed data.

About The Clipper Group, Inc.

The Clipper Group, Inc., is an independent consulting firm specializing in acquisition decisions and strategic advice regarding complex, enterprise-class information technologies. Our team of industry professionals averages more than 25 years of real-world experience. A team of staff consultants augments our capabilities, with significant experience across a broad spectrum of applications and environments.

- ***The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.***

About the Author

David Reine is Director, Enterprise Systems for The Clipper Group. Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. He joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and an MBA from Northeastern University.

- ***Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 23. (Please dial "1-23" when you hear the automated attendant.)***

Regarding Trademarks and Service Marks

The Clipper Group Navigator, The Clipper Group Explorer, The Clipper Group Observer, The Clipper Group Captain's Log, and "*clipper.com*" are trademarks of The Clipper Group, Inc., and the clipper ship drawings, "*Navigating Information Technology Horizons*", and "*teraproductivity*" are service marks of The Clipper Group, Inc. The Clipper Group, Inc., reserves all rights regarding its trademarks and service marks. All other trademarks, etc., belong to their respective owners.

Disclosure

Officers and/or employees of The Clipper Group may own as individuals, directly or indirectly, shares in one or more companies discussed in this bulletin. Company policy prohibits any officer or employee from holding more than one percent of the outstanding shares of any company covered by The Clipper Group. The Clipper Group, Inc., has no such equity holdings.

Regarding the Information in this Issue

The Clipper Group believes the information included in this report to be accurate. Data has been received from a variety of sources, which we believe to be reliable, including manufacturers, distributors, or users of the products discussed herein. The Clipper Group, Inc., cannot be held responsible for any consequential damages resulting from the application of information or opinions contained in this report.