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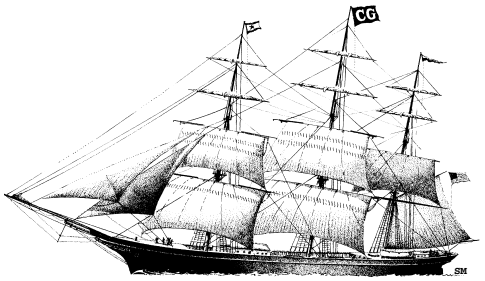

Navigating Information Technology Horizons℠

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Data Center Information Retention and Security — Enterprise Functionality for the SMB

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Management Summary

The economic destiny of every political entity is tied to a complex transportation infrastructure connecting a myriad number of cities and towns existing throughout the physical unit, be it a nation, a metropolitan city, a suburb, or the smallest town. This infrastructure is made up of a network of public transportation, long-distance buses and trains, and a virtual plethora of tiered roadways, from eight-lane, interstate freeways, complete with rest areas, bridges and tunnels to maintain, to intrastate highways connecting major cities, all the way down to a simple, two-lane country road enabling access to exurbia. Population density and trucking requirements determine the capacity of the highway, i.e., the number of lanes, and, therefore, the cost of the infrastructure. As the number of cars and trucks increase, more lanes and more money are required. Because of the cost, governments plan to support what they project to be the maximum traffic at peak commuting hours. You will never see an eight-lane superhighway or a multi-lane bridge leading to a village of a few hundred people (unless, of course, you live in Alaska). The further that you live away from centers of population, the less transportation infrastructure is required.

A similar story exists in the data center as the IT staff tries to **ensure the retention and security of enterprise information**, regardless of the size of the enterprise. Disk alone is not sufficient. For a variety of reasons, for most enterprises, **tape remains an integral component of every data retention infrastructure equation**. The largest enterprises with tens of thousands of users and multi-petabyte data stores need to deploy the most sophisticated data protection mechanisms available to provide for secure, long-term data integrity. They need to support a complex information infrastructure, including tape silos with dozens of tape drives, thousands of cartridges, and the necessary IT staff to safely retain this most important asset. The enterprise data center also needs to have sophisticated software available to provide data compression and manage encryption, to minimize the number of frames and cartridges required and to prevent unauthorized use of privileged information. This may come as a shock to some, but the smallest enterprises, the SMB with tens of users and mere terabytes of data, and there are thousands of them, have exactly the same functionality requirements, simply on a smaller scale. Unfortunately, the SMB cannot afford the same information infrastructure budget as the largest enterprise; the smallest SMBs need an enterprise infrastructure solution designed for them. Where can they look to find it?

The IT staff of any SMB looking for tape innovation should be looking to IBM, the progenitor of magnetic digital tape. From the *Model 726* in 1952 to its *LTO-4* tape drive in 2007, IBM has solutions for the largest *and the smallest* enterprises. Today, IBM can provide the SMB looking to secure and retain information with the new *TS2900 Tape Autoloader*, a low-cost and secure element of any information infrastructure. To learn more about the TS2900, please read on.

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Data Center Requirements

Every data center, whether enterprise or SMB, has been experiencing a period of unprecedented growth within their data storage environment. Most are expanding their information capacity by 50% to 70% annually, while many are doubling capacity in the same period. This growth is placing a tremendous burden on the IT budget, as the CIO attempts to control the total cost of ownership (TCO) of the data center environment. The IT staff not only has to acquire additional primary storage platforms, but they also must take steps to ensure the long-term retention and protection of that additional information. Many enterprises have migrated to a disk-to-disk (D2D) storage environment to facilitate the backup and recovery process, as the amount of data they need to save is stretching the bounds of the backup window and disrupting application performance when a recovery is required. The TCO and data protection challenges of a D2D environment, however, create an unacceptable burden on the IT budget[1]. The IT staff must cope with acquisition costs and the ancillary costs associated with the power required to drive and cool the expanded storage architecture, the space required to house the disks, and the additional technology needed to protect the data from unauthorized access.

For these reasons, many CIOs are looking at a D2D2T environment, deploying tape to reduce the TCO and energy consumption of long-term storage as well as to enable manageable data protection strategies. The data center must be able to cope with all of the components of an entire information infrastructure. An enterprise data center may have the resources necessary to assemble the required components, and knit them together into a patchwork quilt. Can the SMB? How can a data center with limited staff create a working solution to their information dilemma?

While the enterprise data center may have a plethora of resources, and budget, to adequately retain and secure the information infrastructure with high-end disk arrays, Tier-2 disk as a D2D target, tape silos, and data deduplication and encryption appliances, the SMB does not. SMBs need an entirely different solution. They require a low-cost, open system, turnkey solution. They need a solution, such as *LTO*[2] technology, to protect the investment in existing data. Implementing *LTO-4* tape drives can enable the data center to protect previous LTO investments by being able to write in *LTO-3* format and read *LTO-2*, while LTO-3 enables the ability to write LTO-2 and read *LTO-1*.

The SMB needs a flexible information infrastructure with an entry-level automated tape backup or archive solution, in a desktop or rack-mounted configuration. Space and power are significant issues for the SMB. The SMB requires a compact configuration with a high-density capacity to make up for a lack of floor or rack space. Portability is mandatory for the off-site storage of information for archive or disaster recovery purposes. Portability, however, also implies additional requirements for data protection. The SMB must have the ability to encrypt any data that will leave the confines of the data center to ensure the increased security of archived data. In addition, the SMB must be able to prove that data has not been altered, requiring support for WORM media to ensure compliance with all industry and government required norms.

With a limited budget, flexibility is a critical factor for the SMB in terms of use of tape as a sequential autoloader or a random access library. This requires the availability of a barcode reader for identification of the correct cartridge. The tape platform must also include replaceable magazines and an I/O station to enable continuous operation.

Management is another important element in an information infrastructure. Even more than the enterprise, the SMB requires a web-based management capability to enable the remote management of autoloader/library functionality for remote offices.

IBM TS2900 Tape Autoloader

IBM has introduced a tape autoloader called the TS2900 that utilizes their LTO generation 3 and generation 4 LTO half-height drives with a SAS interface, facilitating an affordable tape solution with the direct-connection to any qualified server.

IBM designed the TS2900 Tape Autoloader as an entry-level, compact tape library that is designed to support data retention and information security within an SMB information

[1] See the issue of Clipper Notes dated February 13, 2008, entitled *Disk and Tape Square Off Again – Tape Remains King of the Hill with LTO-4,* and available at http://www.clipper.com/research/TCG2008009.pdf.

[2] Linear Tape Open.

infrastructure, with low cost, yet high capacity, high performance, and high reliability. The TS2900 can operate as a sequential tape autoloader, or, with the standard bar code reader, as a random access library, for unattended save and restore operations, although with only one tape drive. At a cost of $5,500 for the TS2900 LTO-4 SAS model, this is the lowest entry point anywhere for LTO-4 automation[3]. IBM's LTO-4 SAS drive, Model H4S, has the same 800GB native capacity as the full-height FC model and, at a throughput of 120MB/second native, is comparable to the FC drive, but at a significantly reduced price. A single TS2900 can store up to 14.4TB in a 1U rack enclosure with 2:1 compression. The LTO-3 SAS drive has a native cartridge capacity of 400GB and a throughput of 60 MB/second native, enabling a library capacity of 7.2TB with a 2:1 compression ratio.

The TS2900 is easy to deploy and maintain with plug and play installation. It provides remote management capabilities to enable administration through a web interface. The IT staff can install the TS2900 Autoloader in a rack or desktop configuration. With a 1U form factor, it enables the data center to conserve space while utilizing the latest LTO-4 technology.

The TS2900 can be configured to include one half-height LTO *Ultrium 3* or LTO *Ultrium 4* SAS tape drive with a 3 Gbps interface, designed specifically for reliable performance in SMB environments. It includes a single, removable magazine with nine cartridge slots based upon IBM's patented high-density slot technology similar to IBM's recently announced high-density storage frames for its enterprise class *TS3500* tape library, which allow the storage of over 1,300 LTO cartridges in a single high density frame. The TS2900 magazine includes a single I/O station to help support continuous operation. The removable magazine facilitates the offsite relocation of media for vaulting of archival data and disaster recovery needs. The TS2900 supports standard LTO compression ratios to reduce capacity requirements. The LTO-4 drive has an encryption capability to secure data from loss, at the device level, protecting the enterprise from the inadvertent or deliberate compromise of archived data, and will support *Transparent LTO Encryption* to deliver advanced systems managed and library managed encryption through a web-based delivery system. Transparent LTO encryption is enabled through IBM's license key *Encryption Key Manager*. The LTO-3 and LTO-4 drives both support WORM cartridges to maintain the integrity of archived data.

Additional magazines are available and priced at only $695 to facilitate cartridge replacement in the autoloader. In addition, Ultrium 4 cartridges are priced at $420 for a 5-pack, reducing their cost to only $80/cartridge. The Ultrium 3 cartridges can cost less than $40 apiece. With media representing a major portion of the TCO of any tape archive system, this will reduce the TCO of the data center information infrastructure significantly.

IBM supports the TS2900 on many platforms including IBM's *System x* and *System p*, Sun *SPARC* servers and a wide variety of open systems servers. In addition to Microsoft *Windows*, the TS2900 is supported on *AIX*, *Red Hat* and *Novell SUSE Linux*, and *Solaris 10*.

Conclusion

One of the key building blocks for any SMB in constructing an effective information infrastructure is the long-term retention and security of enterprise data. With the TS2900, IBM presents all SMBs with a low-cost, integrated strategy to retain, compress, and encrypt all mission- and business-critical data. Using the same concepts that they use to build archive solutions for the largest enterprises, IBM has assembled a low-cost solution for information retention and information security for the SMB. If you value your data to the same degree as the largest enterprises value theirs, but lack the budget for a higher-priced FC solution, then you need to consider IBM's TS2900. It can protect your data and your pocketbook, while easing the burden on your administrative staff.

[3] The LTO-3 model costs $4,500.

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