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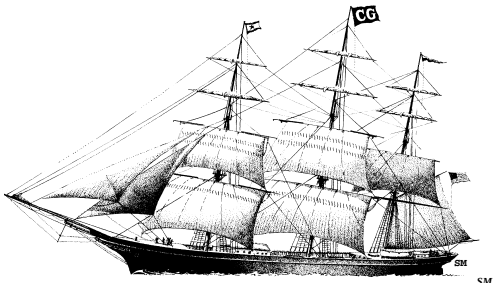

Navigating Information Technology Horizons℠

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Protect Your Tape Storage Investment — Scale-Up with Spectra Logic

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Management Summary

I hate to go shopping. I'm not talking about going to the supermarket for a gallon of milk and a loaf of bread, or to Wal-Mart for a pair of blue jeans and a shirt. I am talking about shopping for a new car or even a major appliance. If I need a new refrigerator, for example, I don't need a spouse to help me – I need a psychic or perhaps a prophet for guidance. How big a refrigerator will I need? How big should the freezer be? The size of your family certainly has a bearing, but what happens if the family that normally hosts the big holiday dinner cannot do it this year? All of a sudden, you may need twice as much freezer space. Can you make your freezer larger? No, you would probably have to go out and buy a brand new appliance, with a new, expensive investment. Furthermore, what about a new car? You may have a family of four (and a dog), but what happens when Junior joins a Little League team and, as the assistant coach, you have to car pool six or seven teammates, bats, and balls? Exactly how do you fit that much cargo into your five-passenger sedan? Unfortunately, once you invest $20,000-to-$30,000 in a new car, it is unlikely that you will be willing to scrap that investment and buy a minivan, losing 25% in trade-in value. **You cannot stretch the size of your refrigerator or your automobile**!

The same problem exists in the data center of every mid-size or larger enterprise. With mission-critical data doubling in quantity every year, the CIO must implement a plan to protect this information, one of the enterprise's most valuable assets. Over the past few years, many data centers have transitioned from a traditional back-up/recovery strategy of disk to tape (D2T) to one with disk-to-disk (D2D) as the primary strategy. Predictably, **with the cost of energy going up and its availability going down, many data centers are returning to tape for their long term recovery and archiving needs with a disk to disk to tape (D2D2T) deployment**. Determining how big that tape library needs to be, however, is more involved than simply doubling enterprise capacity for five years. The data center may use Oracle as a relational database, but the CIO will need the Oracle of Delphi to assist in predicting how fast data will grow. What does the IT staff do if senior management decides to acquire a new business or two? What is the impact if the enterprise goes public and new financial compliance regulations demand the preservation of additional data for years to come?

There are two opposing strategies in vogue to implement tape libraries in the data center. The first, a *scale-out* deployment, has the data center install a rack-mounted, modular library drawer with limited expandability. As the amount of data grows, the enterprise adds more library drawers, and complexity, to the environment. The second tactic sees the data center install a single, self-contained solution that *scales-up* with room for more drives and cartridges. To see how Spectra Logic enables the data center to deploy a scale-up solution that protects the investment already made, please read on.

IN THIS ISSUE

Data Center Storage Growth

Two of the highest profiles issues that are plaguing enterprise data centers today are server sprawl and the explosion of storage requirements in support of mission- and business-critical applications. Because of inefficiencies in the deployment of some mission-critical servers in a scale-out environment, these servers often utilize only 15% to 25% of the systems' computing power. At the same time, however, they are consuming 100% of the energy required to run these distributed platforms. In order to improve these statistics, the data center staff implements programs to both consolidate multiple servers onto a single, multi-core, multi-socket server, designed with a scale-up architecture, and also virtualizes multiple applications within these systems in order to better utilize previously-wasted compute cycles. At the same time, the data center is experiencing tremendous growth in the quantity of information that the enterprise requires to remain competitive in a very tough economy. **Some data centers are experiencing a doubling of mission- and business-critical information being saved on an annual basis, not to mention additional incremental growth resulting from mergers and acquisitions and new requirements needed to meet regulatory compliance.** Consolidating and managing this data and protecting it from theft and/or accidental loss have become a full-time job in order to cope with the complexities of a virtualized data center.

Some enterprises utilize tape today to preserve and protect historical information, and now are looking for a more scalable solution to replace their current, and aging, legacy tape environment. This replacement architecture must be able to address senior management concerns to simplify the infrastructure, improve the utilization of floor space, and, most importantly, decrease energy consumption. As with the server environment, the data center staff should be looking to scale up the tape library, as well.

On the other hand, other enterprises have transitioned their backup/recovery processes from a D2T environment to a D2D architecture in order to meet recovery SLAs required to suit the needs of a 24x7x365 Internet client/partner community. Unfortunately, the total cost of ownership (TCO) to keep tens of terabytes, or even tens of petabytes of historical backups and archived files on spinning media includes the cost of the electricity to keep those disks spinning. With the cost of energy rising out of control and the availability of that resource limited, many CIOs are once again seeing the value of keeping historical data on tape cartridges, in a disk-to-disk-to-tape (D2D2T) architecture, with tens, hundreds, and even thousands of cartridges stored in scalable libraries for unattended access, even in a lights-out environment[1]. A D2D2T environment enables the data center to preserve information in a TCO-efficient manner, while retaining the latest backups on disk in order to satisfy the recovery SLA. This addresses the preservation of the data. It is important to note, however, that the IT staff must also secure the data when it leaves the confines of the data center.

Whenever tapes containing customer, partner, or employee data leaves the physical confines of the data center, they are subject to the vagaries of the transportation industry. They can be lost or stolen. If either event occurs, your enterprise would be subject to significant financial risk, notifying all concerned that his or her personal data may have been compromised, and enrolling them in a credit protection program, not to mention the long-term damage to enterprise reputation from the headlines on the evening news. The data center must encrypt all tapes whenever they travel, either to a partner for processing or to a disaster recovery site, to protect the enterprise from exposure.

All of this leads to the unanswered question: What kind of tape architecture should the data center deploy?

Tape Library Alternatives

Tape solutions run the gamut from single drive autoloaders for the simplest backup needs, to multi-petabyte silos to handle data collection and archiving, as well as backup requirements. Data centers looking for a scalable solution with multiple drives to protect the mission-critical backup environment in case of a drive failure have several options.

The first option, and one with broad appeal in the SMB space, is a rack-mounted, 2U or 4U drawer with two commodity drives that can support from 24 to 48 cartridges. SMBs requiring scalability can deploy multiple units, in a scale-out architecture, managing these integral systems through a common interface, but with no means to move cartridges automatically between systems to take advantage of unused resources. There has always been a wide variety of open systems tape formats to choose from, from *AIT* to *SDLT* to *LTO*. Today, the majority of SMBs go open with LTO,

[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.

or Linear Tape Open, specifically LTO-4[2]. With an integrated WORM[3] capability, along with a native encryption mode, LTO-4 provides the security that data centers require when transporting media outside their facilities and it provides the compliance characteristics that senior management requires to prove that the tape contents has not been altered. In addition, LTO-4 is compatible with previous generations of the format.

At the high end of the spectrum is a second option, for the largest enterprise data centers and government agencies looking for the highest performance and scalability. This option is the proprietary silo, deployed in multiple, scalable frames, primarily from IBM and Sun, supporting literally thousands of cartridges and dozens of proprietary drives, the *TS1120* from IBM or the *T10000* from Sun. As expected for a system with mainframe-connect capability, the silo solution carries a hefty price tag and scalability well beyond the requirements of most mid-sized enterprises.

The third option, found among a broad segment of mid-sized enterprises, is a multi-unit, scale-up library architecture comprised of a base unit and expansion drawers, with a pass-thru mechanism to transport cartridges between units. Individual drawers are capable of supporting their own drives, cartridge slots, and power infrastructure. Several leading tape library vendors employ this shared logic architecture enabling a higher cartridge density within a shared footprint, which is available in both deskside and rack-mounted configurations. One advantage to this environment is that you can deploy a limited library initially, with minimum capital expense, scaling higher as the demand arises. Unfortunately, some data centers find the upgrade process onerous in terms of the time required to install and align the pass-thru robotics, as each upgrade can result in a half-day service call. In addition, when you reach the maximum scalability for each library complex, typically 200 to 400 cartridges with multiple LTO-4 drives, you need to add another complex or replace the original with a new library with higher scalability and higher cost, losing investment in the legacy environment.

Spectra Logic has now attempted to solve these problems by introducing a fourth option for the beleaguered data center manager: a family of integrated scale-up libraries, within a single robotic chassis – the *Spectra T-Series* – with the scalability that mid-sized data centers require, while at the same time, protecting the investment made in the existing environment.

The Spectra TranScale T-Series

The Spectra T-Series consists of a scalable family of libraries, each contained within a single chassis, but designed with interchangeable and transferable components in order to protect the investment that the enterprise makes in Spectra Logic's *TranScale*[4] architecture. Starting with an initial capacity of 50 slots, the data center can add capacity on demand by logging onto the Spectra Logic web site and requesting a key to enable additional slots. When growth in data center storage reaches the current T-Series library's maximum capacity, the IT staff does not need to buy a completely new library. The T-Series reuses all components from the existing model in the next higher model, simply migrating them to a larger chassis. All you have to change is the outgrown cabinet – you retain the original tape drives, power supplies, robotics, and control modules. You can even retain the same serial number through the USB export feature. The upgrade is fast and easy, usually taking a single 4-hour service call. In addition, Spectra Logic protects your investment in the existing library by pricing the upgrade at the price list delta between the two libraries.

Spectra Logic engineered the T-Series to be energy efficient, using innovative *TeraPack* containers, with 10 cartridges in each and stored on horizontal shelves, eliminating 90% of tape handling and improving loading efficiency, enabling a denser storage environment and consuming less power for an environmentally friendly data center. The data center even retains these TeraPacks during the upgrade. At a time when energy has become an expensive commodity, Spectra Logic's *BlueScale Energy Audit* software enables the data center to track actual power consumption through the library's touchscreen, or remotely through a Web browser, giving the IT staff greater control of the data center and its budget. In fact, Spectra Logic has measured the energy use of the T380 at a low .71 Watts/TB. BlueScale Energy Audit is just one element of Spectra Logic's *BlueScale Environment*. The BlueScale Environment is a software solution that enables the T-Series to work simply, flexibly, and safely with your data, to simplify the

[2] See the issue of Clipper Notes dated July 12, 2007, entitled *LTO4 Pounces into the Data Center with New Life, Greater Capacity, and Higher Performance*, and available at http://www.clipper.com/research/TCG2007073.pdf.

[3] Write Once, Read Many.

[4] The ability to transform a smaller library into a larger one quickly and reliably, onsite, in less than half a day.

data protection process. Other features include encryption, utilizing AES-256 bit encryption through the library, or using the LTO-4 native capability, and key management, with the keys stored locally or remotely and sharable between Spectra libraries.

In addition to tape, the T-Series also supports a full Virtual Tape Library (VTL) capability through the addition of 2.0 TB *RXT VTL* disk drives and media. RXT drives write data to removable RXT disk media, enabling the data center to gain the benefit of enterprise-level, high-speed backup and recovery while retaining the ability to move media off-site as easily as tape. **This establishes a multi-tier storage environment – within the T-Series library - for the data center with an Information Lifecycle Management (ILM) plan in place**.

Spectra Logic provides a standard next-business-day on-site warranty with a wide range of support alternatives, including same business day, 24x7 worldwide on-site support, as well as self-monitoring, and automatic e-mail notification of issues. Spectra Logic also provides *Spectra AutoSupport* to notify, proactively, both IT staff and *SpectraGuard* technical support of maintenance issues and impending problems. Additionally, Spectra Logic provides a unique *Assisted Self-Maintenance* (*ASM*) option. ASM is a special support supplement that Spectra Logic designed for customers that require minimal downtime. ASM stocks a select set of parts in the data center, enabling the IT staff to make immediate repairs when needed, eliminating delays waiting for a service call to be made.

Initially comprised of the *T120* and the *T950*, with scalability to over 10,000 cartridges and 120 drives, the T-Series has added three new scalable models, each with a low entry price and flexible scalability: the *T200*, *T380*, and the *T680*. With 2Gb and 4Gb Fibre Channel and Gigabit Ethernet interfaces, the T-Series can fit into any open systems data center.

T200

The T200 is an entry level, 20U rack-mounted library configured with a single LTO-4 drive and 50 cartridge slots for only $50,000. When your storage requirement warrants, the T200 can be upgraded up to 8 full-height or 16 half-height LTO-4 drives and 200 cartridge positions.

T380

The T380 is a mid-level, 28U rack-mounted library configured initially with a single LTO-4 drive and 50 cartridge slots for only $65,000. When your storage expands, the T380 is upgradeable to 12 full-height, or 24 half-height LTO-4 drives, and 380 cartridge positions. When fully loaded, the T380 provides superior utilization of data center floor space, with an outstanding 76 cartridges per square foot, denser than any of their competitors.

T680

The T680 is a high-end, 42U rack-mounted library, scheduled for availability later this year. It has scalability for up to 12 full-height, or 24 half-height LTO-4 drives, and 680 cartridge positions, significantly higher than competitive products.

Conclusion

Spectra Logic has introduced three new models of the T-Series library with the technological and financial advantage of their TranScale architecture. Simply put, the data center can easily store an ever-increasing amount of data by simply replacing a smaller library frame with a larger one. With TranScale, the enterprise can preserve the investment made in previous T-Series infrastructure. Not only can you preserve investments already made, but you can also reduce future TCO through the savings in energy management and data center floor space, through the higher densities available in the T-Series. With an integrated disk component, a removable one at that, the IT staff can implement a modern ILM strategy, improving SLAs while at the same time reducing cost.

With built-in encryption and key management, the data center can cover itself in glory as it protects the enterprise, and more importantly, the senior level executives, from lawsuits, fines, and serious embarrassment, when, not if, media is lost or stolen.

Last but certainly not least, the availability of an Assisted Self-Maintenance program ensures that the library environment will be up and running whenever you need it, not only for scheduled backups, but also for the inevitable recovery that always occurs when you can least afford to be out of service.

Spectra Logic has put together more than just a superior tape platform. They have delivered an integrated solution to both protect the enterprise and save it money. What more could you ask for?

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