



Dell Introduces Scalable Line of Tape Libraries — When *One Size Does Not Fit All*

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Management Summary

What do you think of when you hear the term *one-size-fits-all*? To me, it translates to *one size fits nobody really well*. I think of the young people down at the mall with T-shirts down to their knees, or other apparel which simply does not fit properly. T-shirts and hats are only fashion statements. What happens when that label is applied to a piece of safety equipment that is supposedly designed to protect you? For example, I get a little concerned when I see the one-size-fits-all label on a bicycle helmet. You know the kind, a hard plastic shell with some number of foam inserts. You simply add more inserts until the *safety* helmet fits, sort of. To me, it makes more sense to buy a helmet designed to fit my head, properly, in order to do the job for which it was purchased.

The same scenario is becoming more evident every day in the information technology (IT) community. A variety of platforms and appliances are being built every day by start-ups and established vendors, based upon a one-size-fits-all philosophy and commodity architectures, and sold to enterprises large and small, without regard for the number of users or degree of functionality required. Companies with a single product, like the proverbial one-trick pony, try to force-feed inexpensive systems designed for small and medium enterprises (SMEs) into larger environments under the guise of *scale-out* economics. If one device is not sufficient to do the job, buy two or four. They are cheap and easy to install, just like a *Lego* kit. No one seems to be concerned about the complexity of managing the configuration, after all *it comes with system management software*; software, I might add, which could contain functionality that you do not need but have to pay for, anyway. In the opposite case, salesmen with a high-end product might try to sell the SME more than it needs in order to handle future growth. We need to show pity to the inexperienced CIO who over-provisions his data center to prepare for unrealized growth. This scenario is especially true in the backup and recovery arena, where CIOs are seeking tape library solutions in response to enterprise mandates for long-term protection of both mission-critical and compliance data, to keep the enterprise operational, and to keep the Board of Directors out of jail.

Some vendors with a limited product set will propose a convoluted solution in order to make a sale, while other vendors with more complete product portfolios will try to propose a solution that fits the IT requirement. Dell is one vendor that does carry a complete line of scalable tape libraries. Yes, Dell! To see if Dell can solve your IT tape problem, please read on.

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A Variety of Enterprises, A Variety of Problems

I don't mean to alarm you, but while no one was looking, your data has been multiplying...like rabbits! Everywhere you look, in the smallest SME to the largest Fortune 500 enterprise, the mission-critical database has been growing. To make matters worse, industry standards, government compliance regulations, and CxO directives have all conspired to make the job of the data center staff that much more difficult. The cost to acquire additional disk capacity to store this information is manageable. New technology has introduced higher-capacity, lower-cost drives to reduce the acquisition cost. However, saving and protecting this information in compliance with corporate policies is another story.

While the acquisition cost of a disk-to-disk (D2D) solution may not be that much more expensive than a tape solution, there are more costs involved. When determining the total cost of ownership (TCO) for the long-term retention of terabytes of data, the CIO needs to incorporate the cost to keep the disks spinning and also the cost to cool the data center, counteracting the heat being generated by tens, or hundreds, of disk devices. These costs, not to mention the waste of valuable natural resources, can be budget killers for years, providing financial justification to update your tape storage solution. The obituaries for tape that we have all seen in industry literature seem to be a bit premature. In the words of Mark Twain: *The reports of my death have been greatly exaggerated!*

In fact, there has been a sudden resurgence of development activity in the tape drive and tape library arenas. Over the past few years, we have seen an increase in cartridge capacity and performance for commodity technologies such as SDLT and LTO, with native capacities of 300GB (SDLT) and 400GB (LTO), and native sustained throughput up to 36MB/second and 68MB/second, respectively. In addition, high-capacity, high-performance drives such as the TS1120 from IBM and the T10000 from Sun (formerly STK) have appeared within the past few months. With a native capacity of 500GB/cartridge and throughput of 100MB/second (TS1120) and 110MB/sec (T10000), these drives can back up 360GB or

396GB, respectively, to a single cartridge in an hour. While the SDLT and LTO drives can be acquired for about \$10K, the higher performance capability of the TS1120 and T10000 costs significantly more, at about \$30K. Clearly, this is probably more than the average SME will care to spend.

Similarly, there is no one-size-fits-all solution for the backup/retrieval and archive library environment. A tape autoloader or library configuration is driven by the amount of data that needs to be archived or protected and the length of the backup window available to the data center personnel. An SME with 1TB of data¹, or less, may be able to thrive, or at least exist, with an autoloader with a single tape drive and a limited number of cartridges. A Fortune 500 company with thousands of employees and hundreds of terabytes of data, on the other hand, will need a scalable library capable of supporting hundreds of cartridges and a dozen tape drives in order to meet the requirements of their backup window.

In fact, some enterprises require a variety of solutions, even the SME. The data center may need a scalable solution to support 100s of terabytes; a branch office could manage with an autoloader supporting a single terabyte; while a salesperson in a remote location, or even home office, could do nicely with a standalone drive supporting gigabytes. They all need the same interface and the same consistency of deployment to simplify the installation process. Not all vendors, however, carry a complete line of tape storage solutions, from standalone to autoloader to scalable library. In that case the enterprise would have to overprovision the smaller facility or cludge-up a complex, heterogeneous environment for the data center. Neither of these solutions is optimal. There are some vendors who do support a complete line of storage devices. Dell is one of them.

The Dell Storage Solution

In order to provide their server customers with a complete, turnkey IT solution, Dell has been partnering up with a variety of storage providers, to simplify the acquisition and

¹ An LTO-3 drive can backup a 1TB database in less than 4 hours, using a 2:1 compression ratio, on two cartridges.

operations processes. One of the more visible unions of late is their partnerships with EMC, where Dell jointly develops, manufactures, and provides complete services for the disk storage arrays sold under the Dell logo. The *Dell/EMC AX100* and *CX SAN* arrays and the *Dell/EMC NS500G NAS Gateway*, all managed by EMC's management tools, have been very successful products not only for Dell, but for their customers also. Being able to do one-stop shopping with a single vendor simplifies the IT acquisition for the smaller enterprise and removes a significant portion of the complexity for data center operations. Now Dell is extending its capability in the tape arena, with the goal of producing a robust, affordable technology to meet all data center needs.

Dell has had full coverage in the entry library area with the *PowerVault 122T* auto-loader and the *PowerVault 132T* dual drive tape library. These products provided support for enterprise tape needs up to 24 cartridges. The mid-range was covered by the *PowerVault 136T* with 72-cartridge capability and the *PowerVault 160T*, capable of scaling up to 1,344 slots. Unfortunately, moving from the 136T to the 160T required a swap out, as the 136T was not upgradeable.

Now Dell has completely updated their tape family, retaining the two-drive PowerVault 132T entry library and upgrading their autoloader to the PowerVault 124T, doubling the number of cartridges and quadrupling the capacity to 6.4TB with LTO-3. They have also replaced the PowerVault 136T and the PowerVault 160T with a new, highly-scalable platform which spans the entry to mid-range arenas, the *PowerVault ML6000*. This provides Dell with an enterprise-class portfolio of libraries.

Introducing Flexible Scalability

The PowerVault *ML6000* is Dell's first modular tape library. It is an intelligent mid-range library platform designed with an integrated server-class controller, running Dell's integrated library management software, which includes the following features.

- Native partitioning,
- Mixed media support,

- Data-path readiness and management,
- Proactive alerting and monitoring, and
- Performance reporting.

These features may be accessed either locally through the library control panel or remotely via an HTML interface.

The ML6000 delivers outstanding scalability with capacity on demand to eliminate the problems caused by a limitless proliferation of information. It is designed to protect the investment that enterprises make in initial configurations, lowering the total cost of ownership for the data center.

The ML6000 comes in a pair of pre-configured, rack-mounted base models, the *ML6010* and the *ML6020*, so that the right model can be delivered to the right place at the right time. The ML6010 is a 5U rack-mounted library with support for two *LTO-3* drives and 36 cartridge positions. The ML6020, a 14U platform, provides support for up to 6 drives and up to 128 cartridge slots with capacity on demand flexibility.

In addition to the flexibility provided by a choice of base models, Dell also provides even more scalability through the installation of additional 9U expansion modules, each with support for four more *LTO-3* drives, SCSI or Fibre Channel, and 92 additional cartridge slots. Today, Dell has qualified up to six *LTO-3* drives and 128 cartridge positions, but a fully-configured ML6000 will support up to 18 *LTO-3* drives and up to 404 cartridge slots, connected to the server network via Fibre Channel or an LVD SCSI interface². Your enterprise can install an entry-level ML6000 in a workgroup or in a remote office and expand it to a midrange data center installation, via a fast, efficient, and above all, easy mount procedure. This preserves the investment that your enterprise has made in hardware, software, and training. All of the tape cartridges and drives operate as a single library and are served by a single, self-aligning, continuous robotic system to provide for high performance, high reliability, and easy service access, with a mean-time-to-repair

² Full ML6000 scalability is expected by the end of 2006.

(MTTR) of 30 minutes. In fact, the ML6000 can inventory 128 cartridges in 25 seconds.

For every ML6000 larger than the smallest 5U system, users can select a capacity-on-demand configuration that includes extra tape storage positions that are physically present in the library but not activated. Users then add capacity non-disruptively by purchasing a software authorization key, adding tape positions in increments of 46. The 9U expansion modules also support capacity-on-demand growth – each expansion module containing zero, 46, or 92 authorized tape positions when installed. This enables the data center with the flexibility to support a storage capacity of 14.4 TB of uncompressed data or as much as 232 TB of compressed storage, using a 2:1 compression ratio. In addition, the ML6000 will support a throughput of 80MB/second with a single uncompressed LTO-3 drive, or as high as 10TB/hour, using compression, with 18 LTO-3 drives. This gives the *midrange* data center staff the flexibility to size the library to the backup window, ensuring mission-critical application access to the data needed.

Scalability in capacity and throughput are *important* features for the enterprise to ensure a successful and timely backup of the most valuable resource that the enterprise owns – information. *Reliability is vital*. The ML6000 has been designed with built-in, intelligent diagnostics to help isolate failures and improve system availability. The ML6000 is configured with predictive failure analysis to proactively review all components (sort of like Dr. Phil) and notify the data center in simple English, via e-mail, of any pending failure. It also proposes alternative paths to avoid unscheduled downtime. The library also uses administration and troubleshooting wizards to simplify the administration and maintenance processes.

Dell also provides a variety of remedial and professional services focused on the ML6000, covering support, deployment, asset management, training, certification, and planning.

Conclusion

No matter what size the enterprise, the CIO must be thinking about the long-term preservation of both mission-critical and

compliance data. If all you require is a single drive or a self-contained autoloader configuration, then there are any number of vendors who can provide your enterprise with a solution tailored to your *current* needs. If you are in a growth situation, however, and desire a scalable solution, or your enterprise has diverse requirements with a data center, regional offices, and remote locations, or departments within an enterprise with specific IT needs, then you need to think about acquiring a set of tape solutions with a common look and feel that can co-exist anywhere in your environment.

Dell has that complete line of libraries, certified with industry standard backup and retrieval applications from companies such as Comm-Vault, Veritas, and Yosemite. Dell is a total systems solution provider, including tape. If you are looking to implement your first automated solution or upgrade an existing one, take a look at Dell, you may not have to look further.



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