Tape Backup: It’s Relied On

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"There's a lot of technology that is applied to disk storage today that has not yet been applied to tape," IBM's Barry Rudolph observes. "But as you put more information on a tape cartridge, then you need to get smarter about how to get data off and on."

At first blush, tape storage seems to be a relic from a bygone era, a medium that ought to be too slow and cumbersome to meet an enterprise's data storage needs. But the reality is that tape -- together with the critical business data that it stores -- is liable to outlive us all. "When, as a young engineer, I called up my buddies to say I had found a new opportunity to work in this area, almost all of them laughed," recalls Hewlett-Packard's director of product marketing for tape and online storage, Rick Luttrall. "Then they asked me why I would want to work to promote a dead-end technology."

Twenty-five years later, tape continues to rule, because it is available in portable cartridges at a "cost per MB that is lower than any other solution out there," Luttrall told NewsFactor. "And regardless of what you made have heard, disk technology will never be as cheap as tape, which is why we call it the foundation for data protection," he said.

In the Sweet Spot

"Tape is actually becoming sexy right now because of its use in backup and recovery, its attractive cost structure, and its portability," said IBM vice president of tape storage systems Barry Rudolph. "For the kind of data-storage work that is single-threaded, it is right in the 'sweet spot' for backup."

Tape's longevity in the data-storage market recently has received a big boost from a rash of new accountability rules and regulations that require businesses to archive their e-mails, customer files and transaction records for years to come.

"Enterprises need something that provides the ultimate protection while delivering the fastest-possible recovery speeds," notes Luttrall. "But to protect information, you have to take it off-line -- you must physically disconnect it from the enterprise."

Tape's ability to store data off-line makes it ideal for archiving, "not just in the classic sense of putting data on the shelf, but also in response to regulatory pressure to save e-mails and so on," Rudolph told NewsFactor. "Typically, this data will only need to be retrieved when a company is audited or when there's some kind of legal or regulatory investigation underway."

Tape Versus Disk-to-Disk

"While we are seeing a shift -- in that companies are looking at 3TB as a disk-to-disk solution -- that doesn't take care of the customers who want to be able to recover from a catastrophe like the one that recently happened in Florida," said Gateway's senior director of servers, storage and networking Tim Diefenthaler.

"If we look at the market as little as five years ago, tape was significantly more expensive," Diefenthaler told NewsFactor, "but today the cost of archiving 3TB of data is less than $5,000. So it just makes sense to prepare your business for recovery from a disaster, a virus or the intervention of a disgruntled worker," he added. "For this, tape is the only way to go.

"One downside of tape is that data backups will consume some of the bandwidth of the network," Diefenthaler admits. "The reason why we're now seeing an uptick in disk-to-disk solutions is speed. Tape is slow, but disks are fast," he notes.

"But you don't have to replicate your primary solution and secondary data-storage solution to the same capacities," Diefenthaler points out. "With disk-to-disk backup systems, you can replicate the data to a second disk. And then at a certain point in time, you can archive that to tape."

Virtual Tape Server

Recovering from a disaster typically requires restoring a volume, which consumes a significant amount of time to retrieve from tape. The technology also is not the best choice for random-access applications, because it would take minutes instead of milliseconds to retrieve data requests sent from an ATM machine, for example.

"Clearly, as time moves along, more and more data-storage systems will be deployed to market that will have combinations of disk and tape, and the virtual tape server is one example of this," notes Rudolph.

With the disk, tape and software packaged together as a system, "it presents itself to the application as a tape," Rudolph says, "so that it looks like an automated tape library and it's being used to build information-lifecycle management applications that can do everything that needs to be done in a self-contained appliance."

The virtual tape server features the ability to store data in a disk cache, which means fast writing to the buffer, added Rudolph. "The disk, therefore, can collect very big chunks of data before moving them to the tape drive to get the most efficient I/O when moving data to its eventual resting place on the tape."

Customer Challenges

One former challenge to I.T. shops installing tape-backup systems was that the accompanying software applications used to be difficult to set up.

"It was hard to configure the tape backup," admits Diefenthaler. "But more recently, improved user interfaces have vastly simplified the process," he said.

"When bottlenecks occur, it is usually because of the disk system, not the tape system," adds Luttrall. "The backup sizer we've created can be used to size some backup applications, and our performance tool can be used to check to see if the disk is meeting its backup window. We have done demos that show it is possible to store 3.5 TB per hour with one library of 16 drives ... and even support up to 6 or 7 TB when looking at data that is very compressible."

Future of Tape Technology

Investments currently are being made in fundamental recording technology that eventually should allow businesses to squeeze even more data onto tape cartridges, Rudolph reports.

"Moving from today's 1 TB of highly compressed data, we see a pretty clear path to get 15 to 20 TB-range native capacities," he predicts.

"There's a lot of technology that is applied to disk storage today that has not yet been applied to tape," says Rudolph, "but as you put more information on a tape cartridge, then you need to get smarter about how to get data off and on."

One way to do this is to implement a software layer that can assist businesses in composing and managing data throughout its lifecycle, so that data-storage decisions happen naturally and automatically based on company policy.

"Linking business characteristics to information lifecycle-management applications will be critical in the future for tape to continue its leading role," Rudolph added.

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