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Why Organizations Need LTO-5 Today

Information is constantly being added to corporate databases growing the amount of structured data. And unstructured data including office productivity application files, images, video, and audio files are being added at unprecedented rates. As a result, there is simply much more data, many more files, and many more larger files to store today than ever.

For years, tape storage systems have played a key role in efforts to store data for backup and retrieval, archiving, and contingency planning purposes. More recently, tape has been called on to help preserve and safeguard data to meet data retention laws and regulations.

The challenge is how to manage, retain, and safeguard the data volumes being generated today.

New tape technology provides a solution. With a capacity to store 3 TB of data per cartridge, recently introduced Linear Tape-Open (LTO)-5 tapes offer twice the storage capacity of LTO-4 and about four times the capacity of LTO-3 systems. Additionally, LTO-5 offers the higher throughput, enhanced security, and advanced data protection features required to do business today.

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Storage and security demands continue to multiply

To put the data explosion issue into perspective with respect to its impact on tape, consider that even in last year's tough economic times shipped disk storage capacity grew at a remarkable rate. All of the data being placed on that new disk capacity needs to be backed up, and much of it must also be retained for long periods of time.

An indication of the data explosion in companies (even during the worst economic times last year) comes from a 2009 *eWEEK* article. The article reported[1] on the IDC Quarterly Disk Storage Systems Tracker, noting that in the first quarter of 2009 disk storage systems capacity shipped reached 2,460 petabytes, an increase of 27.3 percent over the same quarter a year earlier. That trend continued throughout the year. In the third quarter of 2009, total disk storage systems capacity shipped reached 2,661 petabytes, growing 21 percent year over year, according to IDC.[2] If disk volumes are growing at these rates, data stored on tape must also be experiencing double-digit growth since the data needs to be backed up and much of it must be archived.

1 "Weak Server Sales Knock Data Storage Revenues Down 6%," *eWEEK*, March 6, 2009 http://www.eweek.com/c/a/Data-Storage/Weak-Server-Sales-Knock-Data-Storage-Revenue-Down-6-Percent/

2 "IDC Finds Encouraging Signs of a Turnaround in the Enterprise Storage Systems Market," IDC News, December 4, 2009 http://bit.ly/alvFos

So how should an organization best protect that data? Many companies are using disk-based systems for short-term backup and tape for long-term retention. For example, it is quite common to stage recently generated data on a disk system for fast retrieval if a file gets deleted or becomes corrupted. Such systems also provide for quick access to backed-up data.

However, tape is the critical element in ensuring that data is preserved longer-term.

In many cases, companies use a tiered storage approach where data is progressively migrated to appropriate price/performance storage devices. And even when a tier is used for disk-based backup, companies backup that data to tape for long-term retention, archiving, and offsite safety.

In addition to its use for backup and retrieval, offsite storage of data on tape is the primary element in most disaster recovery and business contingency plans. To put the value of offsite storage and the need for adequate disaster recovery into perspective, a 2009 *Wall Street Journal* article[3] noted that while about 25 percent of businesses do not reopen after a major disaster, the percentage doubles for companies that lack a continuity plan.

There are specific regulatory mandates such as Securities and Exchange Commission regulations that require certain financial documents to be retained for seven years. And businesses must keep certain financial and tax records for comparable periods to satisfy the IRS or Sarbanes-Oxley regulations in the event of an audit. There are also industry-specific regulations, such as the Health Insurance Portability and Accountability Act (HIPAA) and the Payment Card Industry Data Security Standard (PCI DSS) that govern data privacy.

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Further, since December 2006, when amendments to the Federal Rules of Civil Procedure went into effect, companies have been impacted by so-called eDiscovery laws. In particular, companies in litigation are now often required to produce e-mail, documents, digital voice mail messages, and other files. This has compelled many companies to archive data (particularly e-mail messages) for longer periods than would have been needed in the past.

Tape keeps pace

New tapes and drives based on the generation-five specifications for the LTO-5 program offer the high capacity and performance needed to match the growing data storage challenge faced in most companies.

In all applications – backup, archiving, disaster recovery, and data retention – the ability to store more data on a single tape cartridge keeps costs down, while helping make tape management easier. To put the potential savings into perspective, consider that a single LTO-5 tape can store 3 TB of data (2:1 data compression). That's twice the capacity of LTO-4 tapes and four times the capacity of LTO-3 tapes. So, significantly fewer tapes are needed to back-up the same volume of data. This saves on the cost of media and on tape management time put in by the IT staff.

Naturally, as data volumes grow, the time it takes to perform a backup or archiving operation grows as well. To address this issue, LTO-5 offers help in two areas. First, LTO-5 technology supports higher data throughputs. Specifically, LTO-5 delivers 280 MB/s throughput (2:1 data compression). That's 40 MB/s faster than LTO-4 and 120 MB/s faster than LTO-3 (2:1 data compression). Faster throughput allows companies to complete backup and archiving jobs faster, which is important as data growth increases.

3 "Ready for the Worst," *Wall Street Journal*, September 9, 2009
http://online.wsj.com/article/SB125250249415695553.html#mod=WSJ_hpp_sections_smallbusiness

A second performance enhancement in LTO-5 is an interface that supports 8 Gb Fibre Channel (FC) connections. This allows LTO-5 to be deployed into an 8 Gb FC network, making it easier to stream data from high-performance storage disk drive systems to tape backup. In such deployments, the higher throughout performance offered with LTO-5 complements the high-speed network connection.

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Additionally, LTO-5 technology is read- and write-compatible with LTO-4 cartridges and backward-read compatible with LTO-3, which protects a company's investments and simplifies data migration projects.

In the future, an additional benefit will come when applications leverage another feature introduced in LTO-5 technology. That feature is the capability to partition LTO-5 media, providing enhanced file control and data indexing. This can enable near-line applications to index data on tape, facilitating data access and archiving on tape.

New pressures, additional benefits

LTO-5's higher capacity and performance clearly helps in addressing the data explosion. And it also can help with the data management and protection challenges businesses face today.

Most companies are trying to rein in operational costs. One area of focus for IT operations is cutting back on the use of electricity. Additionally, some companies are embracing sustainability and green initiatives that seek to reduce the amount of energy used.

This focus on reduced power consumption is driving revived interest in tape. The reason: spinning disks need electricity for power and cooling. A 2009 blog[4] by the early-stage venture capital fund New Atlantic Ventures noted that IDC estimated that in 2008, it cost $36.29 to power and cool an average data center disk drive for a year.

Once data is stored on tape, no electricity is required to preserve it. The Clipper Group estimates that power costs associated with storing data long-term on tape are less than 1 percent of the cost of storing the same data long-term on disk.

Data protection and data privacy are also concerns for many companies today. Over the last two years, there have been numerous incidents where private data about employees, patients, or customers has been exposed due to lost or stolen tapes, according to the nonprofit consumer organization the Privacy Rights Clearinghouse. The organization's Chronology of Data Breaches[5] includes many banks, businesses, and healthcare providers that have experienced this problem. In such breaches, the companies faced possible bad publicity, fines, penalties, and a loss of customer confidence.

A 2010 *eWEEK* article[6] quantified the risk from such data breaches. The article cited a Ponemon Institute study that found the average cost of a breach in 2009 rose to $204 per compromised record, up from $202 in 2008. The study also found that the average organizational cost of a data breach rose from $6.65 million in 2008 to $6.75 million in 2009.

4 "Data: The New Landfill," New Atlantic Ventures blog, July 23, 2009
http://navfund.com/blog/data-the-new-landfill

5 Chronology of Data Breaches, Privacy Rights Clearinghouse
http://www.privacyrights.org/ar/ChronDataBreaches.htm#CP

6 "Data Breaches Cost More if Enterprises Move Too Fast," *eWEEK*, January 25, 2010
http://www.eweek.com/c/a/Security/Data-Breaches-Cost-More-if-Enterprises-Move-Too-Fast-799901/

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LTO-4 incorporated native encryption technology to protect data stored on tape. Many companies made the move from LTO-3 to LTO-4 for the added protection. LTO-5 continues the effort by offering the same encryption technology. In particular, LTO-5 drives encrypt data using the 256-bit AES algorithm, which is recommended by the U.S. government for the highest levels of data security. With this technology, the encryption keys are, as the name suggests, 256 bits long, making them nearly impossible to guess or crack using brute-force techniques commonly employed by hackers. (The data is useless without the correct encryption key to unlock the data.)

Additionally, encryption by LTO-5 drives is hardware-based, meaning companies can reap the highest levels of security without any loss of performance during the encryption process.

For companies that did not make the move to LTO-4, this may be the time to upgrade to LTO-5. The reason: due to the rapid growth of data breaches and identity theft over the last few years, there are now significantly more data privacy laws and regulations. For example, beyond regulations such as HIPAA, there are relatively new industry mandates such as PCI DSS, as well as numerous state privacy laws. Encryption is essential in meeting these regulations and laws.

Additionally, many of these new regulations require special data-handling procedures to ensure data is not tampered with or deleted. Similar to its encryption support, LTO-5, like LTO-4, supports Write Once, Read Many (WORM) technology required to pass audits and meet regulatory compliance requirements.

Quantum as your technology partner

For years, Quantum has been a leader in data storage, leveraging its real-world expertise in developing complete solutions. Its tape technology and systems automate data management, backup, recovery, and archiving.

In early March 2010, Quantum announced availability of the industry's first tape automation systems and standalone drives based on LTO-5 technology.

Quantum offers a full range of price/performance tape and disk solutions that include high-capacity media, autoloaders, tape libraries, and disk-based backup systems.

Moreover, the company has partnerships with leading backup, archiving, and data protection solutions providers. This ensures that organizations get a complete data storage solution that is tightly integrated and easy to manage, all of which helps foster streamlined internal operations, solid data growth management, superior end-user and customer service, and bottom-line growth.

For more information, visit:
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