



Still a Classic

Why tape could be the most efficient, inexpensive archive solution

By Rob Sims

On Sept. 29, 1966, the first Chevrolet Camaro hit dealership floors. After four distinct generations and more than 35 years of sales, many people thought the Camaro would be no more. But in 2009, its revival showed just how rooted it was in the American automotive scene. Its fans wouldn't let go of its style and power. Just as muscle-car enthusiasts check to see what's new under the hood, IT administrators will likely find themselves taking a renewed look at their use of tape storage.

Tape's history is long. This year marks more than 60 years of tape storage—it was around 15 years before the Camaro was even conceived. And despite its age and the prevalence of disk, tape could be one of the hottest technologies in the data center moving forward. Difficult to believe? We have countless new regulations and the explosion of data to thank.

The latest tape storage technologies are bringing the medium back to

the future. As tape capacity, speed, reliability and low costs keep pace with head-spinning data archiving needs, tape adoption will likely grow for a long time.

Cloud storage, healthcare, finance, government, logistics and network broadcasting are just a few examples of markets that seem to create data faster than they can categorize it. Organizations of all sizes across industries must

meet longer and more extensive compliance-based data-retention requirements. They're looking for reliable solutions to protect their data and assure it's readily retrievable.

In the U.S., the tougher regulations we've all heard about for years now (the Sarbanes-Oxley Act for financial services and HIPAA for healthcare) impact business IT and constantly add to the amount of data a firm must retain. In Europe, the Basel Accords have added data-retention regulations for businesses as well.

Categorizing is Key

Categorizing is the key to an effective data-retention strategy. What's kept? What's not, and why? How long should I keep it?

Storage of this categorized data is traditionally broken into the three tiers: Tier one is for mission-critical, recently accessed or top-secret files. Solid-state disk (SSD) now serves this type of data and has seen a lot of excitement with the introduction of lower-cost, higher-performance systems. This is impacting the traditional solution (spinning magnetic disk) as the properties and performance of SSD far outweigh disk. But because disk is less expensive than SSD, it dominates tier two: financial, seldom-used or classified files.

This brings us to tier three, defined as event-driven, rarely used or unclassified files traditionally served by magnetic-tape solutions. While tier-two storage hasn't received the same level of visibility, it's the largest and fastest-growing market within storage.

While certain companies have focused heavily on tape's negative qualities, when you get down to the

physics, tape is a lower power, more reliable long-term storage medium that costs less per stored gigabyte than magnetic disk.

The challenge, especially for archive and cloud storage, is that tape has never had the capability to work in a standard file-storage and -retrieval

manner. It has always required a proprietary application that interfaces the user applications to the physical tape storage.

Linear Tape File System

Last year, IBM, HP and Quantum announced support for Linear Tape

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File System (LTFS), a technology that lets a tape drive and media look and behave just like a disk drive or removable storage drive. Now, users can store and retrieve a file just by clicking on it. LTFS is a disruptive technology compared with the disk-based or proprietary-tape-based solutions IT staffs use for long-term data repositories. Firms have announced 35- and 50-terabyte per-cartridge capabilities for future offerings. Both of these developments demonstrate significant investment in and

marketability of tape-based storage capabilities.

In fact, LTFS stands as a major game-changing technology that may revolutionize the storage space, especially archiving. LTFS is open source—any application provider can obtain LTFS specifications from the Ultrium* Linear Tape-Open* (LTO*) Program. As the program states, this enables compatibility among multiple vendors' solutions and unlocks many new archival offerings to organizations that may have been otherwise stuck with proprietary systems.

With high-definition medical imaging and video growing quickly each year, storing all of that new data would simply be cost prohibitive for the vast majority of organizations. LTFS will eventually make tape-based archives the most popular long-term data-storage solution because it lets organizations access archives through one interface. The LTO Program has taken great strides in answering concerns about capacity and ease of use, including vastly improving data search speeds and helping users save money in the process.

Table 1

LTO-5	3.5-inch SATA Disk
1.5 TB stored per tape	2 TB stored
14 cubic inches	23 cubic inches
107 GB per cubic inch density	86 GB per cubic inch density
140 MBps total throughput	35 MBps total throughput

Tape consumes no energy and can store data at a lower-cost offsite location. And its capacity rivals disk—compare the numbers in Table 1 (above).


Classic, Not Old

Tape technology has continued to innovate in the face of the pundits and competitors, increasing access

capabilities as well as capacity, speeds and affordability. Many are warming to the notion that a commodity or veteran product can keep innovating.

Implicit in all the repetitive tape bashing is the suggestion that while disk drives, disk arrays and disk-based solutions constantly improve, tape stands still, an old technology rapidly losing ground as newer tools

sprint ahead. This is easy to disprove. In addition to the new LTFS capabilities, tape still inherently allows for a lot of information to be kept in a tiny space. It consumes little power, it's portable and long-lasting, and its transfer rates are better than disk's.

Tape technology is riding a wave of innovation that promises to change perceptions of this old technology. Like the Camaro, it's a classic from the past that now has a vibrant, innovative future. 



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benefiting from **LTFS**

Because LTO* 5 offers greater capacity in a smaller size than SATA disk, certain industries stand to really benefit from tape. Many businesses have already implemented or are looking to implement archive solutions, recognizing the advantages of online data access for their businesses. Let's examine the cloud, network broadcasting and healthcare as three of the countless examples where Linear Tape File System (LTFS) could really spark interest:

The Cloud

The emergence of networked online storage, or the cloud, has added a new location for businesses to archive data along with the more traditional methods of corporate-owned data centers. To date, cloud storage providers have been able to offer only one tier of storage to the end customer, based on magnetic disk. Not only are the costs prohibitive for large data repositories, the power consumption and poor reliability of SATA disk create scalability issues in current offerings. Additionally, no cost-effective method exists for a business to retrieve or move its data from a cloud provider back to its internal operations or to a different



provider. These issues and security concerns have limited the enterprise adoption of cloud-based storage.

Network Broadcasting

Network broadcasting continues to expand data requirements and demand more performance from IT systems. New 3-D technology adds to the growth of high-density video, and expanding cable networks drive storage volume requirements exponentially for the foreseeable future.

Healthcare

HIPAA and other compliance mandates, as well as the digitization of healthcare facilities, have driven the need for long-term, reliable and secure data archives. Regulations now require patient data to be maintained and accessible for two years past the life of the patient. New imaging technologies and business tools will continue to drive the need for data storage and archive. Like in other data archive markets, the challenge is developing a scalable, affordable solution for massive volumes of data. The requirement to have data online limits archival solutions.

—R.S.