Conquer the Top 4 Challenges of Tape Storage Technology

Effective tape storage management is the cornerstone of an efficient data center.

During the last three to five years, the typical data center manager's responsibilities have changed, driven by both new technologies and new business imperatives. The result is a challenging set of issues that rise not only from the need to learn and explore new ways to meet exploding data storage, but also the need to strategically manage tape storage into the future.

Here are four key trends challenging your management of tape storage, with efficient strategies to help you meet your business objectives.

Trends Challenging Your Management of Tape Storage

Exploding demands

The most significant trend in data storage — the increase in the amount of data being stored — is having a tremendous impact on data centers. For certain applications, it's estimated that data doubles every 12 to 18 months! This doubling is driven not only by the sheer amount of data being stored, but also by the increasing size of stored files and the push to store data for longer periods of time.

Further, how and when companies use stored data is changing as well. For example, not many years ago data stored in archives were seldom, if ever, accessed. Tape storage was viewed as an electronic form of microfiche or file cabinets. But with increased processing power, sophisticated applications and faster access times, today's archived data has become an information asset that is reused again and again. New ways to leverage historical data — such as data mining to extract customer trends — are driving sales and marketing programs. A handful of years ago this data lived in long-term, seldom accessed archives.

Meanwhile, more recent data is under pressure for immediate and continuous access. The explosion in e-commerce, coupled with rapid business globalization, now demands 24x7x365 accessibility to stored data.

On top of these pressures, companies must deal with data conversion from legacy to new technologies as businesses consolidate through mergers, acquisitions and other circumstances.

Changing role

To paraphrase Mark Twain, reports of the death of tape storage have been greatly exaggerated. While some pundits have for years been predicting the demise of tape as a viable storage medium, it remains the most cost-effective, flexible and scalable medium for high-capacity, long-term and backup data storage.

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by Chris Caprio

Indeed, many new business imperatives for data storage are falling squarely on the shoulders of tape. One of the results of data mining, e-commerce and globalization is that tape is being used for roles far beyond the traditional batch processing and backup/restore functions. Tape is becoming more of an integral, mission-critical, interactive, near-online storage medium. Data stored on tape is defined as a value-added proprietary corporate asset.

Soaring technology

The new generation of tape technology offers capacity and performance that, a decade ago, were nearly unimaginable. Tape system formats such as IBM's Magstar 3590E system, StorageTek's 9840 and 9940 system and the new open format Ultrium LTO system, provide access times and capacities that could scarcely have been imagined only a few years ago.

Only in the last decade have data center tape libraries begun to surpass the one terabyte mark. Based on recent tape technology advances, it is not unimaginable to someday have a tape cartridge that can store one terabyte on a single tape cartridge.

On the performance side, new technology translates to faster access times. For instance, new applications are being deployed that take advantage of fast access tape formats where the differences in access times between fast access tape and hard disk are not critical to the end user. The advantage is that while both systems demand equal management time and resources, tape storage drives and media are generally less expensive on a per-gigabyte basis than disk or optical storage.

The tape management implications of these advances in tape technology are significant in terms of managing larger and more critical volumes of cartridges. Given these issues, many are finding it more efficient and cost-effective to outsource some of the tape management functions that are vital but also highly labor-intensive. For example, some companies now offer services to meet needs such as label and initialization, data migration, degaussing and secure disposal. Others take the process a step further by analyzing a data center's overall tape library performance and recommending areas for improvement. This can allow a data center manager to turn the tide toward proactive management.

Increasing pressures

While technology surges forward and expectations rise, data center managers are also dealing with another business imperative: the ongoing need to reduce costs. This can lead to a shift in priorities and resources away from legacy systems. Maintaining and properly managing legacy systems may be viewed as an overhead expense, subject to cost cutting.

Today, many data centers also function with fewer staff even while coping with greater volumes of data and job requests. In addition, a lack of qualified staff continues to hamper many data centers.

This means the tape management function may not be receiving the time and attention from data center managers that they might have been able to devote previously, a constraint that can't exist for long without potentially serious consequences. Any failure to properly monitor tape usage and performance may result in problems. Common manifestations can include increases in the number of data errors or damaged or unusable tapes. These issues are preventable through proper tape handling, maintenance and library monitoring procedures.

Media problems also can ripple back through the entire data center, resulting in longer batch processing times, as well as longer queues and slower response times for system resources. This can adversely impact company operations,

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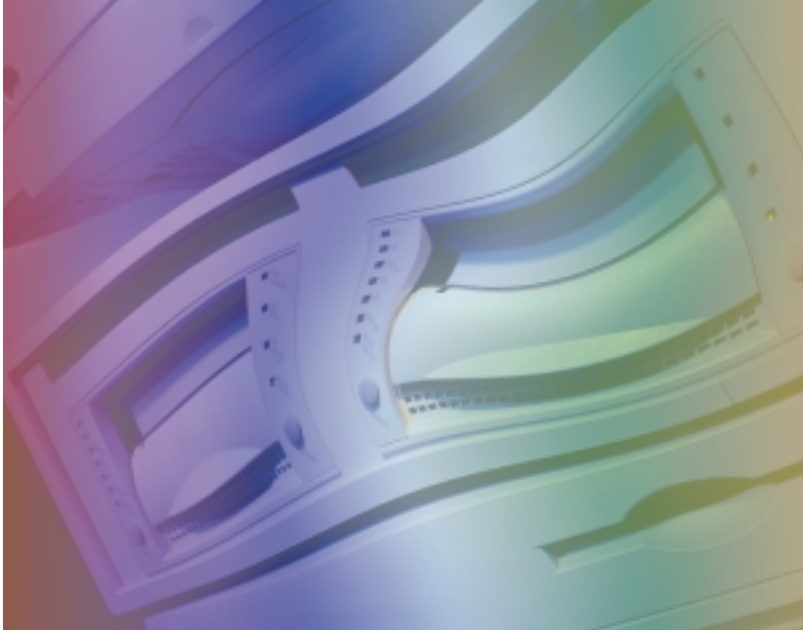


compromising client delivery times. Results can include outages of e-commerce services, missed service level agreements and other disruptions that can cost a company time and customers.

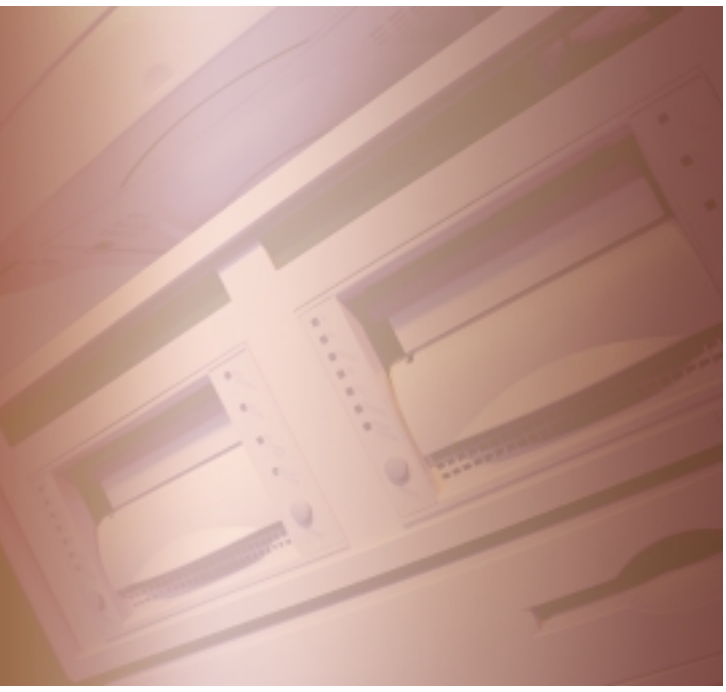
The final translation of doing more with less is an inefficient utilization of data center resources. Without experienced, qualified personnel to guide a data center's strategic tape management efforts, the center can easily wind up with either too many or too few tape drives for their needs, as well as excess or too little floor space for libraries and tape racks. The result is wasted infrastructure and floor space, underutilized media or insufficient capacity rather than an optimization of tape infrastructure.

Successfully Managing Today's Challenges

Understanding the role of tape

Effective tape management clearly requires understanding the importance, the value and the strategic role of tape storage. Many years ago, it was commonplace to view tape storage as almost an afterthought: a cheap, readily available long-term method of storing large volumes of data. No longer.

Tape storage is now more commonly a mission-critical component. It is vital to both the minute-by-minute operations of a business as well as its overall and long-term health. The data handled by tape is the lifeblood of the company and not just its history.



Today's storage environment is multi-faceted and increasingly complex. Tape and disk each play a critical and unique role in this environment.

In a sense, tape can perhaps be viewed as a victim of its own success. Because tape usually takes less of an initial investment than disk, it can be tempting to follow the sometimes quickest and easiest solution of simply throwing more drives and tapes at capacity and accessibility bottlenecks. In addition, tape is easily transportable for sharing with outside parties such as vendors or clients. Successfully managing tape storage over the long haul, however, requires a committed investment in ongoing resources.

Managing the 3 Ps: policies, processes and procedures

Effective tape management begins with effective data management. Great planning and forethought go into the deployment of any tape subsystem in a data center. But it's all too easy to focus on big parameters — capacity, access times, connectivity, etc. — and not scrutinize the details that make a critical difference. Details to consider include:

- What types of data need to be stored?
- Are there parts of the data that do not need to be stored?
- What are the file sizes?
- How frequently will the data need to be accessed?
- Are there compatibility issues with clients outside or vendors?
- Is there a need to replicate or consolidate the data with other systems?

Bottom line: Tape management should be viewed as a necessity, not an afterthought. Once the appropriate subsystem is in place, data centers need proper policies, processes and procedures.

For example, care and handling is a critical issue that extends far beyond the climate-controlled walls of the data center itself. It begins as soon as the tape arrives,

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during packing and movement to the data center by trained personnel under appropriate environmental conditions. Many data centers miss this process — the result is the use of tapes that were received on pallets and unpacked in environmentally uncontrolled areas.

Once inside the data center, each tape needs to be monitored for data errors and other anomalies. Policies should be spelled out for dealing with errors when they occur — transferring the data, marking the tape and removing it from service if warranted. Tapes should be tracked by usage — number of mounts, time in service, error performance — and retired according to policy. Waiting only until tape failure occurs to replace a tape should never be the policy. Doing so places a data center's serviceability to its clients unnecessarily at risk.

Finally, library assessments can be an effective tool for identifying and optimizing tape management procedures. An effective assessment can pinpoint potential weaknesses and problem areas. The results will suggest procedural changes, training requirements and best practices that can optimize tape management.

Proactively Managing a Moving Target

The challenges of the new millennium reflect the advancing capabilities of tape and the changing demands of business. But there are operational and strategic ways today's data center manager can manage the moving data storage target. This requires a clearly defined tape management function driven and owned by the data center manager and part of a process that delivers business results.

The ultimate challenge for today's data center manager? Diligence and a dedication to extracting the best of what tape storage can provide. ■

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