While tape has been used for decades for data storage, the technology continues to evolve. Today, organizations can continue to use tape to address many of their storage issues around data protection and data sprawl.

**Using Tape to Solve Data Management Problems**

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**Questions posed by:** LTO Program

**Answers by:** Phil Goodwin, Research Director, Infrastructure Systems, Platforms, and Technologies

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**Q. Ransomware is top of mind for business and IT leaders alike. What role can tape play in ensuring data survives attacks?**

**A.** Malware and ransomware may well be the biggest threats to serious data loss today. Attacks, leaks, and sabotage from internal bad actors are other serious threats. The good news is that tape can help in all cases.

The bad guys have figured out that if they can compromise the backup data copies — through either encryption or deletion — then when they attack the production data, the victim has no choice but to pay the ransom to get their data back.

Tape can play a critical role in recovery. Having an offsite and offline copy stored on tape — what is called an "air gap" — ensures there is a copy of data that cannot be accessed by the bad guys. This means there is always a way to recover the data without paying a ransom. When an air gap is done properly, it also can ensure recovery from internal attacks. In addition, the LTO specification has the highest commercial levels of data encryption, making the physical tape almost useless to anyone who might attempt to access it.

Recently, the U.S. Department of the Treasury determined that any company that paid ransom to an organization subject to U.S. sanctions could be sanctioned themselves. For example, if you pay a ransom to an Iranian or a North Korean entity, you could be sanctioned. Not knowing the identity of the party that is perpetrating the ransomware attack is not a defense. Thus, being able to recover data is essential. Tape can fulfill this role.

**Q. What storage problems does the massive growth of data create, and how can tape help organizations address them?**

**A.** Our research shows that data volume is doubling every two to three years. Most of the data created is rarely used. In fact, it's reasonable to expect that 60% of data is rarely accessed. This is often called "dark data." Of course, the amount will vary by industry and organization. As data gets older, it is typically accessed less and less frequently.
Large volumes of dark data cause several problems. First, it is very expensive to store rarely accessed data on primary storage. Second, it causes long backup windows, and frankly, it is pointless to back up unchanged data over and over. Third, large data volumes can impact the performance of production applications.

If this dark data can be moved to tape, the average cost of storage per GB goes down dramatically — tape is still the lowest-cost storage medium by far. This opens up primary storage for data that is accessed frequently and solves all the problems just mentioned. Organizations that expect to access the tape-based data can put it into a nearline system where data access times are still likely to be very acceptable. Moreover, organizations do not need to sacrifice data access for low cost when using tape as an active archive tier. With active archive, data is stored on nearline tape systems commensurate with the nature of the data and at a very low TCO.

Q. Data sprawl is a problem that IT organizations are experiencing and is only getting worse. What is data sprawl, and how does tape help address it?

A. Data sprawl occurs when applications create data in different locations, usually at the core datacenter, in the cloud, and at the edge. Data becomes siloed due to geographical location, data type, system platform, and so on. As a result, data protection can be inconsistent because different tools are used to store the data in different silos and the data may be managed by different teams.

Tape helps address data sprawl because it can be used as the common storage factor across the organization. Tape can be used to ensure that data is captured and retained in a consistent, recoverable manner.

Q. Cloud-based backup has attracted a lot of attention. Why would organizations need tape if they have backup in the cloud?

A. First, cloud and tape are complementary technologies, not replacements. In other words, it’s tape and cloud, not tape or cloud.

Cloud is a great place to store data as an offsite repository to ensure data survival in the event of an onsite disaster. But with the growing size of data repositories, recalling large volumes of data from the cloud back to on premises often isn’t practical and may be quite expensive as well. The bandwidth may not be available, or it is simply cost prohibitive to deploy. In addition, the egress fees from the cloud may make recovering large volumes of data a pricey proposition.

Tape, on the other hand, can scale to restore large volumes of data in the fastest possible time. With a little bit of simple math, IT managers can calculate the recovery time from tape to ensure that it meets business SLAs. Thus, many organizations will keep an onsite copy of data tape locally with a secondary copy in the cloud for a worst-case scenario. This is in line with the 3-2-1-1 backup strategy: 3 copies of data on 2 different types of media with 1 online offsite copy and 1 offline offsite copy.

This is another instance where active archive can help. By having access to the entirety of a data store, organizations can apply analytics to the entire store to derive maximum value without the time needed to move large volumes of data to the cloud or the ingress/egress costs of cloud. This doesn't mean that tape is always a replacement for cloud; it means that organizations need to understand the benefits of both and make the right choice for the right situation.
Q. How is tape a long-term solution for organizations?

A. LTO tape has become the de facto industry standard for tape. There are other formats, but mostly for specialized workloads. The LTO standard is managed by the LTO Program, which is a group of major vendors — tape manufacturers, tape drive manufacturers, and tape library manufacturers — that cooperate on the development of the standard. This standard is published with at least two future generations so that IT leaders can always see what the future holds.

LTO cartridge capacity and data throughput have kept up with data growth over the years. Tape density and capacity keep growing to pack more data into the same physical space. Throughput has similarly increased, meaning that IT organizations can continue to meet their backup and recovery SLAs even in the face of massive data growth. Media manufacturers also claim a storage life of up to 30 years for organizations that need extremely long archive times.

Because the program has so many members and competition is robust, tape continues to be the lowest $/GB storage medium in the industry, allowing IT organizations to manage and reduce the cost of data storage.

About the Analyst

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Phil Goodwin is a Research Director within IDC’s Enterprise Infrastructure Practice, covering research on data management. Mr. Goodwin provides detailed insight and analysis on evolving industry trends, vendor performance, and the impact of new technology adoption.
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About LTO Program

Linear Tape Open (LTO), also known as the LTO Ultrium format is a powerful, scalable, adaptable open tape format developed and continuously enhanced by technology providers Hewlett Packard Enterprise (HPE), IBM Corporation and Quantum Corporation (and their predecessors) to help address the growing demands of data protection in the midrange to enterprise-class server environments. This ultra-high capacity generation of tape storage products is designed to deliver outstanding performance, capacity and reliability, combining the advantages of linear multi-channel, bi-directional formats with enhancements in servo technology, data compression, track layout, and error correction.

Since the first LTO products were brought to market, over 5.6 million drives, 351,732,245 cartridges and 370,870 Billion GB of media capacity have been shipped, making LTO Ultrium the most successful tape format in history.

For additional information on the LTO Program, visit [www.lto.org](http://www.lto.org).