

Using tape as part of an active archiving system with object storage



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Data growth shows no sign of slowing

During the pandemic, with so much disruption to normal business routines and processes, it would have been easy to assume that data growth rates also experienced some kind of slow down.

The reality, however, was very different. For example, the LTO Program recently announced that 2021 was a record year for tape media capacity shipments, reaching a new record of 148 exabytes. And multiple studies reveal that backup and archive data volumes continue to grow.

Where is the data coming from?

Most of this new data growth is being driven by unstructured data. In a May 2022 report entitled “Worldwide Global StorageSphere Forecast, 2022–2026,” the analyst IDC estimates that by 2026, as much as 60% of all business information data will be cold, unstructured content, and it spans almost every vertical segment. It’s increasingly being created and used at the edge before being migrated back to a more traditional data center environment for backup and long-term archival retention.

Active archiving in the ascendent

Intelligent active archive solutions are coming to the forefront as businesses meet the challenge of managing this colossal quantity of data throughout its lifecycle. A typical active archive solution can integrate different storage technologies (flash, disk, tape) and architectures (file systems, object storage) so that data is stored in the most appropriate storage class based on considerations such as ease of access, security, cost, and scalability. For longer-term retention, object storage has emerged as a key component of active archive deployments.

The benefits of object storage

Object storage is an ideal means to store archive data because it eliminates the tiered file structure used in file storage, and places everything into a flat address space, called a storage pool. The metadata associated with each object is key to the success of object storage topologies because it provides a deep analysis of the use and function of data in the storage pool. It is ideal for artificial intelligence (AI), machine learning (ML), and deep learning (DL) applications.

Active archiving in the era of Big Data

Some businesses have attempted to standardize all their archive data on a single storage platform, such as inexpensive SATA disks in object storage servers. For the majority, however, data growth rates are exceeding the ability of traditional hard disk technology to keep up. The sheer volume of disks required, to say nothing of the energy cost of running them, makes an all-disk solution impractical.

Meanwhile, this surging trend has broken original assumptions about the viability of using the public cloud as an alternative archive tier. As data grows so does both the OPEX cost of renting storage space and the proportional cost of retrieving a percentage of that data frequently.

Just as with disk-based, on-premises object storage, organizations end up in the same place: trying to manage data growth and utilize the information that is accelerating more rapidly than either the technology or their budgets can cope with. The ocean of data that promised liberation now threatens to overwhelm them.

Object storage and LTO Ultrium tape

Faced with these pressures, many businesses are revisiting the value proposition of LTO Ultrium technology. The LTO tape road map more or less matches the predictions for data growth in the decade to come, creating a significant cost of ownership advantage over disk and cloud alternatives both in terms of unit cost and the cost per terabyte / square foot of space occupied in the data center.

And LTO tape is also highly secure. When data is preserved on LTO tape behind an air gap, it is impossible for a ransomware attack to corrupt the data through the network. And while content is at rest on an LTO data cartridge, to all intents and purposes it’s inert and requires no exceptional power or cooling to maintain its viability.

One of the drawbacks of deploying tape in an active archive system was always the fact that tape uses traditional file storage hierarchies to store data. But now there are a number of different technologies available that can utilize HPE tape solutions to store data in native object format.

HPE Data Management Framework

HPE Data Management Framework 7 (DMF7) is a highly scalable data management system for unstructured data in high-performance computing (HPC) and AI environments. In an ever-expanding data universe of storage systems and data lakes, HPE DMF7 is the tool that knows where data is. It helps users manage their files and helps administrators manage file systems.



With 30 years of real-world experience, HPE DMF7 is a centralized system for storing files and copies of files. The HPE DMF7 storage repository can be customized to store files on disk, tape, cloud, or in any combination. Administrators can choose the destinations, the number of copies, and the retention policies for each. HPE DMF7 easily adapts to new storage technologies by automating file migration to the new storage systems and media from systems that have reached the end of their useful lives. HPE DMF7 migrates data in the background, keeping this process completely transparent to the end users.

HPE DMF7 integrates with popular parallel file systems commonly used in HPC and AI environments. It is a tool that helps administrators implement site policies consistently across one or many file systems. Because data is the lifeblood of many HPC and AI workflows, HPE DMF7 is a data management system designed for high availability and resiliency. HPE DMF7 uses distributed databases and containerized frameworks to help ensure uninterrupted operation through hardware component failures. Data movers work in parallel to provide scalable and redundant datapaths to the storage devices in the repository.

Today, HPE DMF7 is best suited to high-performance workloads that use Spectra T950 or TFinity tape libraries that are sold by HPE. See [HPE Data Management Framework 7 QuickSpecs](#) for more information.

Spectra BlackPearl

Tape libraries powered by BlackPearl, are a modern object-based storage solution that solves the problem of costly and complex approaches to digital preservation by better utilizing the modern digital tape storage technology. Designed for affordable, long-term storage, Spectra BlackPearl Object Storage Tape is a simple storage solution to preserve invaluable data for any retention period.

Data can be placed into a BlackPearl data repository through several different paths (workstations, applications, and primary and secondary storage) or workflows and multiple concurrent applications. A manual workflow use case allows the end user to identify the files to be moved. Advanced scanning software applications can scan a file system and identify files to be moved based on user-defined parameters (or policies).

The overall principle behind Spectra BlackPearl Object Storage Tape is to integrate flash, disk, and tape in a perpetual tier that integrates multiple storage tiers to intelligently move and retain content seamlessly on disk, tape, and cloud.

For more information, visit spectralogic.com/products/blackpearl-object-storage-tape.

QStar Archive Storage Manager

QStar Archive Storage Manager (ASM) manages a range of storage technologies such as disk storage, RAID, tape libraries (LTO Ultrium LTF5), object storage, cloud storage (public, private, or hybrid), WORM storage, and optical libraries to form an efficient, safe, and cost-effective active archive environment by virtualizing differing storage technologies behind a file system. Users see ordinary file shares and can easily search, find, and retrieve data directly from the archive through either NFS, SMB, or HTTP or S3 APIs.

QStar ASM provides a standard POSIX or Windows NTFS file system interface to the storage devices. This gives any local application immediate access to ASM file systems without any modification. In addition, it means exports can be made from ASM file systems using standard network protocols such as NFS (3, 4), SMB (2, 3), HTTP, FTP, and native protocol server operating systems. The subset of the Amazon S3 protocol is provided through the QStar ASM server. QStar ASM also provides SOAP-based web services that allow you to implement user-specific system monitoring and management.

For more information, visit qstar.com/archive-manager.

FUJIFILM Object Archive with OTFormat

FUJIFILM Object Archive software is an application that sits alongside a customer's existing backup and archiving software and acts as the interface between other storage platforms and the deepest archive tier on LTO tape. Source data is sent from primary storage tier to a nearline archive, either on-premises or in the cloud, to be stored in object format. An on-premises archive could be an object store, such as Cloudian, while a cloud archive could be AWS Glacier. The active archive application defines the storage policies that automatically tier cold data to Object Archive tape to free up space and reduce costs from the nearline archive.

Object Archive handles replication and copying of data to LTO tape to provide secure, offline, and air-gapped storage for archive content. It uses a new, open standard, format, OTFormat, to optimize performance by packing objects in the most space-efficient way. OTFormat packs the index (metadata) and the data together for efficient, cost-effective performance. Crucially, the objects stored on tape are still fully visible within the universal active archive environment and can be sought and retrieved like any other content.

By leveraging S3-compatible API, FUJIFILM Object Archive is able to operate with multiple platforms. You can integrate it with hybrid-cloud and multi-cloud installations and keep a copy of your data on-premises using HPE StoreEver tape storage. Any highly confidential or mission-critical data is protected by a physical air gap between network storage and backup, all while saving you the cost of expensive egress fees.

For more information, visit tapetember.com/object-archive.



Conclusion

In summary, there are now a number of credible and proven object-to-tape storage applications that allow you to get the best of both worlds: better data analytics; faster retrieval and scalability from object storage; and low-cost, secure, sustainable storage from HPE StoreEver tape. This means HPE StoreEver tape can speak the language of the cloud, allowing hybrid environments with a mixture of on-premises, off-premises, and tape, to be fully integrated into a single-tier or active archive.

Learn more at

hpe.com/storage/storeever

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