

Will Disk-Based Backup Replace Tape?

Falling prices have made the speed and availability of disk-based storage economically justifiable for a wide range of businesses. Will increased demand for this technology lead to the extinction of tape as a backup medium?

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The technologies we use to record and access information constantly evolve. Take the music industry, for example. Vinyl records used to be the primary medium in which we listened to our favorite music, and then cassette tapes became the standard. In the late 1980s, compact discs took over as the music medium of choice. Today, we are beginning to see a shift from CDs to downloadable music media such as MP3s. These changes in music formats didn't occur instantaneously. Instead, they developed over time based upon customer perception of the cost-versus-quality attributes each method delivered in terms of ease of use, portability, and resiliency.

An interesting parallel to the storage industry can be drawn here. Tape has been, and remains, the primary data backup medium for most organizations. However, in the past year, there has been an increased demand in the industry for disk-based storage solutions. Knowing many successful VARs are among the first to acclimate themselves to the latest technology developments, it is important to determine why this trend is occurring, and what threat, if any, the rise of disk-based backup poses to the future of tape media.

Affordability, Speed, Availability Increase Disk Demand

In the past year, the cost of disk-based storage has declined rapidly, leading to a more widespread adoption of the technology. "The cost of Serial ATA [advanced technology attachment] disk drives has dropped from roughly two cents per MB to less than one cent per MB in the past two years," says Mike Marchi, senior director, ILM (information lifecycle management), compliance, and data protection for Network Appliance (Sunnyvale, CA). "The decrease in price has led to an accelerated demand for disk-based storage. Two years ago, disk-based storage represented 0% of our business. Today, it is greater than 10%."

While disk-based storage methods are still more expensive than tape, they do provide several advantages. For example, data can be transferred from servers much faster to disk than to tape, allowing customers to reduce their backup windows (the length of time the backup operation is running). Technologies such as multiplexing (a backup method where multiple backup jobs from different servers are written to the same tape) have been incorporated to help tape environments keep pace with disk in meeting the backup speed requirements of some customers. While multiplexing makes tape backup a lot faster, it also makes recovery more tedious. "With multiplexing, data from all servers is on the same tape, so extrapolating information can take more time," says Glen Groshans, director of product marketing for VERITAS (Mountain View, CA). "This added time may be unacceptable to companies forced to comply with regulatory requirements such as HIPAA [Health Insurance Portability and Accountability Act] and Sarbanes-Oxley [an act providing guidelines for financial reporting practices]. In this era of compliance, the speed of the backup itself remains important, but a greater emphasis is being placed on the speed of recovery."

With disk-based backup, data is always connected to the network and can be accessed instantaneously

by customers. This high availability of data provides a faster time to recovery. Disk also provides the ability to store more information using less media and eliminates many operational costs associated with tape handling.

Disk And Tape Hybrids Are Your Best Bet

So, will this increased demand for disk-based storage solutions mark the imminent demise of tape media? Industry experts say no. "Although disk offers advantages in terms of speed and reliability, it still does not fully address the requirements of long-term retention or disaster recovery planning," says Frank Saab, VP of marketing for Breece Hill LLC (Louisville, CO). "Plus, there are still some issues with disk technology in terms of outages and disk failures that can pose risk to your data. Because of this, it is still necessary to incorporate removable media with a long shelf life, such as tape."

With disk drives becoming economically feasible for more customers, the trend is toward solutions that combine disk and tape technologies, with tape retaining its role as the primary storage medium, says Dan Albright, product marketing manager for StorageTek (Louisville, CO). "A hybrid storage approach that combines disk with tape allows customers to leverage the speed and high-availability features of disk as well as the long-term retention and low-cost scalability features of tape," he adds.

Features of these hybrid solutions that allow customers to maximize the benefits of both disk and tape include disk staging, synthetic backups, and disk-to-disk-to-tape (D2D2T) copy. Disk staging and synthetic backups allow customers to speed up their backups to tape, without the recovery problems caused by multiplexing.

With disk staging, data is moved from the servers to disk first, and then migrated to tape at the convenience of the customer. This process shortens backup windows by leveraging the speed of disks and allows for quick recovery of recent data still residing on the disk stage. Once the data is migrated to tape, customers have the long-term media they require for disaster recovery purposes.

Synthetic backups allow customers to do one full backup of a server to tape initially, followed by incremental backups to disk that can later be moved to tape. Incremental backups are much faster than full backups, because only the files that have changed since the last full or incremental backup are included. A new full backup can then be created off-line by combining information from the initial full backup and the incremental backups. This eliminates the need for customers to do more than one full backup of a server, which helps reduce backup windows.

D2D2T copy allows customers to make multiple copies of their data simultaneously to both disk and tape. This creates redundancy for archival and disaster recovery purposes. For example, customers can have one copy of their data sent to disk to keep on-site for short-term instant recovery, and another copy sent directly to tape and kept in a secure, off-site location for an unlimited retention period.

The rise in demand for disk-based storage is evidence of an evolution in the storage industry, but it has been an evolution toward complementing tape media as opposed to replacing it. Some media formats are popular for a while, but are quickly phased out by new technologies. (Remember 8-tracks?) Others, like tape storage, are more resilient because they have become a staple in the way we run our businesses. Although it has its weaknesses, tape still is a very effective medium for data backup. While advancements in disk-based technology may raise the question of disk versus tape again in the future, for the time being, tape is still king.