

## Managing Tape in the Age of Disk

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Tape storage, often dubbed a wallflower of IT, remains a fact of life for many storage pros. While disk archiving is undoubtedly on the rise, lots of users aren't ready to relinquish tape's known quantities. Virtualization is still considered a risk, and tape's comparative cost, along with improvements in tape libraries' capacity, security, and integration with disk, make it tough to swing with disk alone.

"A minority of clients -- a very small minority -- are willing to completely forgo tape," says W. Curtis Preston, VP of data protection at GlassHouse Technologies. While there are more folk willing to go tapeless than Preston expected to see at this point in time, he says "more than a couple" clients who've asked him about getting off tape in the last year have backed down on actually doing so.

The reality is that tape, both capitally and operationally, remains less risky in the minds of most users than disk alternatives. At the same time, tape libraries from vendors like HP, IBM, Sun/StorageTek, Quantum, Overland, Tandberg Data, Spectra Logic, and Qualstar are improving in efficiency and reliability. Many suppliers are futureproofing with integrated disk or VTL. (See [Tape's Tally Is Up](#).)

The result is that tape automation continues to be a sizable and stable market. While it may not be quite accurate to speak of a "tape resurgence" -- as IBM's general manager of IBM system storage Andy Monshaw did in June -- it's likely too soon to call its decline. (See [Hyperbole on Tape](#) and [Tape's Tally Is Up](#).)

"Look, it moves in ebbs and flows. The tape drive or device market has been in decline for quite some time, but the midrange has been growing," says analyst Robert Amatruda of IDC. While single-tape devices attached to servers is largely a thing of the past, tape libraries attached to a number of servers is thoroughly common.

In this transition period, users are investing time and effort to maintain a stable and cost-effective tape investment while planning ahead -- sometimes far ahead -- for the day when disk will rule the archives. As we spoke with the sources above as well as others, we turned up a few common "best practices" for living with tape while preparing for disk. They follow, in no particular order:

**Plan a strategy.** According to W. Curtis Preston, users realistically have several options for migrating from tape to disk gradually: They can install a VTL as a way to deduplicate data before it is sent to a tape library at a remote site; They can keep a little data on disk, in a "caching" setup, with the tape library continuing to be the main storage mechanism; Or they can spring for the cost of a VTL and send all data to it, making one backup copy to tape that is then given to Iron Mountain or a similar service provider to store off site.

If a VTL is used for deduplication and staging, that doesn't affect the tape setup; and if a VTL becomes key to on-site storage, investment in tape can be reduced by limiting the amount of data that is backed up and relying on an outsourcer for the actual tape archiving.

The choice of a general strategy will depend on a customer's data, recovery objectives, and budget. Some may see tape as an ongoing solution.

"People talk a lot about near-line storage, but for archiving, disk just doesn't have the capacity," insists Kelly Kotera, president and CTO of [e-Engineer Inc.](#), which specializes in implementing television station IT. When it comes to video, he says, companies like Los Angeles' ReelChannel are finding tape libraries to be the best choice for archiving. "Unless companies have an access issue, it's the most practical approach... until holographic disk comes along," he states.

**Clarify tape's role.** Note that all the above suggestions call for the inclusion of tape. Analyst Greg Schulz of the StorageIO consultancy says users should nevertheless keep an eye on how to phase tape out, if that's what they want to do. "You've got to maintain some backward compatibility. It could take a year or two or more to phase out tape... The move to VTL does not have to eliminate tape. The shift to VTL can give tape a nicer role in archiving and backup... VTL can act as a buffer," Schulz says. If VTL is used to compact and deduplicate data before it is stored on tape, less tape should be required for archiving.

**Think about restoral.** Preston of GlassHouse reminds folk to consider the ultimate goal of archiving, which is to restore something in the event of failure. Tape isn't the speediest way to do that. "In a true disaster, reaching for tape or anything that behaves like tape and doing a restore is crazy," Preston asserts.

On the other hand, there may be plenty of reason to do incremental restores from tape. Bruce Wiley, a backup systems administrator with Baltimore-based solutions contractor [Ingenium Corp.](#) who's been working with the

U.S. government's Arizona-based [Aerospace Maintenance and Regeneration Group \(AMARG AB\)](#), has confidence the agency's Spectra Logic LTO-3 tape library can meet all backup contingencies. The device is directly attached to a group of IBM and HP servers and backs up about 3 to 9 Tbytes on any given week.

"Surprisingly, restoring from tape doesn't take a long time. We could get a file back in 20 to 30 minutes," Wiley says. "If a server fails, though, it could take 48 to 72 [hours] to get it back."

**Beware of high-end hype.** LTO-4 tape libraries can double the capacity of existing devices and come with integral hardware encryption. They can also be overkill for some shops, particularly ones that may be saving money for future VTL. (See [Users Linger Over LTO-4](#).) Bruce Wiley says his group looked at LTO-4 but passed because they could get the job done with LTO-3. "We really haven't seen enough stats on it," he says. Further, he felt LTO-3 was adequate to the capacity needs of the job, and in cases where firms have less than 1 Tbyte to back up, he feels older AIT (Advanced Intelligent Tape format) drives may be adequate.

**Think hard about security.** Most experts say integral hardware-based encryption, a feature of newer LTO-4 tape libraries, is nice to have, but not universally ideal. "It doesn't solve all problems," says IDC's Amatruda. Indeed, unless key management is under control, encryption can be a liability. "There's an interest in it, and newer tape products have it, but they co-exist with products that don't have it. There has to be a way to manage the older ones already on site," he says.

Everyone we talked to felt an external encryption device, such as those from Neoscale or NetApp's Decru could be a better choice than integral encryption, given the range of devices that need to be covered with key coordination. "You should have encryption on any data at rest -- tape, disk, or optical... Key management is an argument for an external device," says Greg Schulz.

Some even question the need for encryption. "Encryption is a good idea if employees are moving tapes off your secured site. You don't want data to appear somewhere else simply because a package was lost," says Bruce Wiley. But if tape is archived in house, there may not be as great a need to encrypt.

Preston of GlassHouse thinks it's vital, though, to encrypt all personal or company information that travels off site. "How many companies have to lose backup tapes for the message to get through?" he says.

**Gauge speeds and feeds carefully.** It's vital to test a tape library's performance in a specific network, experts say. "For anyone investing in tape today, the number one thing is that they need to be cognizant of the speed of the device they're buying," says W. Curtis Preston. "The No. 1 cause of backup failures today is the lack of a match between the speed of data coming off disks and the speed of the tape drive."

An LTO-4 device can compress data by half and deliver performance at up to 180 Mbytes/second. Even though many LTO-4 devices can back down, they'll still be faster than the ability of most servers to feed data, Preston notes. Speed discrepancies lead to "bad things," like media write failures and tape drive failures. "Not to mention that you're not getting your money's worth out of a \$40,000 or \$50,000 device," Preston says.

Integration of the tape device with surrounding gear is a must. "You need to look at how the tape library integrates with new types of backup software and storage appliances," Greg Schulz notes. If you're using a VTL, check with the vendor about its ability to keep up with transfer rates, he suggests. "It's a two-way stream."

In summary: Tape libraries will be a given for the foreseeable future, and as such need to be considered in the same realistic glare as any other network or storage add-on. "The best thing anyone can do is keep meticulous records and monitor data. Pull all the reports, understand and look at trends before you buy. How critical are your backups? What is the impact of short- or long-term failure? You need to weigh the purchase against cost of doing business or not doing business," says Bruce Wiley.

— Mary Jander, Site Editor, [Byte and Switch](#)

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