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14 TLC tips for your tape storage

If tape is in fact not dead, and going to be around for a long time, you should learn how to make this technology work better in your IT environment. This E-Guide from SearchDataBackup.com outlines common tape backup errors and gives tips on how to get the most out of this backup method. Read on to learn more.

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Common backup tape storage errors: TLC for your tape storage

By Alan Earls

"Tape is not dead." So says Steve Suesens, category manager at Staples Technology Solutions, and a veteran of 20 years in IT positions. "As long as data continues to double every 12 to 24 months, tape will be around for a long time," he said. In fact, noted Suesens, backup tape storage may have some reliability advantages over disk backup storage, but the key is keeping the media safe and protected and having a thoroughly thought-out backup strategy. It should include things like tape care and handling and proper management of operations within the data center that could impact tape.

Backup tape storage tips

So if tape is going to be around for a long time, it makes sense to learn how to make tape work better. Suesens offered a laundry list of simple "care and feeding" tips that can help, like not stacking cartridges more than six high to reduce the risk of dropping and edge damage. Other backup tape storage tips include:

- Don't leave tapes in a dirty or damaged drive.
- Don't leave tape in drives after they have been read or written.
- Always store tapes in their plastic "clamshells."
- Never touch the surface of the tape itself since the residue on fingers and the mechanical stress can cause damage.
- Be sure to respond to any drive messages that mention hard or soft errors or indicate that you need to clean the drive. Suesens said a feature currently included in LTO tape cartridges -- a cartridge memory chip -- further helps ensure tape reliability by tracking available space, soft and hard errors, and other information that can allow staff to better manage tape.
- When you clean a tape drive, use a good quality drive cartridge cleaner and follow the manufacturer's cleaning recommendations. Fortunately, he noted, in most modern systems the cleaning is handled automatically by a specially configured cartridge, minimizing the skill and dedication needed on the part of staff. "The days of cleaning around the old reel-to-reel tapes with a Q-tip and isopropyl alcohol are in the past," he added.

- If you plan to transport tape offsite or to a disaster recovery location, make sure it is stored carefully in appropriate containers, not just cardboard boxes or plastic postal bins. "You want to make sure it isn't in a device that has any closed cell foam dividers, which can harbor all kinds of particulates," he added.
- Likewise, he said, you should avoid cardboard boxes or dividers that can be loaded with paper dust. "There are many manufacturers of transport cases specifically designed to protect tape," he added.
- Keep media away from copiers and printers, which produce paper dust and toner dust which can also contaminate tapes and drives.
- Data centers should be cleaned regularly, including space below the sub floor, in and around equipment, and in air handling ducts. "Any kind of dust, even from concrete floors, can damage tape," he added.
- Avoid magnetic fields from devices such as electric motors and loudspeakers.
- When you bring tape in from offsite, make sure it is allowed to acclimate to the temperature and humidity for 24 hours.
- Other "common sense" ideas include not smoking, drinking, or eating where media is used or stored.
- Avoid high temperatures (vehicles used to transport tape are a common problem)

Suesens said tape vendors can help with staff training. "Most media manufacturers will offer care and handling sessions free of charge," he added.

That data does not exist

How about the longevity of backup tape storage? Suesens said customers rarely get to the end of the recommended life for tape. "It's almost never an issue -- people load data on tape and then it usually just sits," he said.

Advice for what to do when things go wrong comes from Mike DeNapoli, an enterprise systems engineer and expert in Microsoft Exchange technologies at Double-Take Software, a provider of software for data recoverability. He said the most common tape backup error messages may be "that the data doesn't exist." DeNapoli said that's because the majority of tape backup users (based on his informal research) do not perform test restores of their data, and thus have no proof that the data was successfully backed up. "They see that the tape system finished the backup each night, but do not confirm that the data is useable on

the tape," he said. As a result, when it comes time for an emergency restore, tape software may work perfectly, but the hardware is not writing properly -- or vice versa.

The second most common error, according to DeNapoli is missing files. Tape backup systems cannot always copy files to the tape itself. DeNapoli said this most commonly occurred before the advent of capabilities such as Shadow Copy. Otherwise, without carefully checking the backup job logs to ensure that no files were skipped, users may find that critical files were in use or locked, and therefore never backed up.

DeNapoli said one thing users can do to avoid these problems is to perform test restores of random files at least monthly. "This should be done from each stage of backup, so if you do disk then tape, you need to test restore from both platforms," said DeNapoli. And, he noted, you can typically restore to a different directory or server than you backed the data up from, so the test restores do not impact production workloads. Freeing up the IT staff to perform test restores should not be a "like-to-have" operation, he stresses -- it is critical.

Sharing DeNapoli's focus on tape errors, Chander Kant, the CEO of Zmanda, a provider of open-source backup and recovery software, said the most common errors involving tape are I/O errors and "the data you want to restore is not on this tape." Too often, he said, the cause boils down the familiar litany of housekeeping chores along with instances of companies trying to employ tape that has exceeded its service life. However, he adds one more "gotcha" -- namely the frequent failure to properly label tapes so that you can find the data you want when you need it. On a more technical level, he points out the problem of "shoeshining" (the tendency for tape drives to cycle tape back and forth rapidly in a way that can damage tape and drive components when data transfer rates are too low). Although many efforts have been made to avoid this problem it can still happen in some situations, potentially leading to read errors, so users should be on the lookout for the problem.

Kant said those who try to prolong the service life of a backup tape, beyond the recommendation of the manufacturer, are taking a significant risk. Instead, he said, consider using older media only for "nice-to-have but not absolutely needed" data.

And, noted Kant, if your organization doesn't have the resources to provide an optimal tape storage environment, consider being creative. "One of our university users stored tapes at the music department, which had a better temperature environment," he said.

Kroll Ontrack vice president of data recovery Jim Reinert said his company usually sees "the worst" of tape problems. "Some of the most common problems we encounter are tapes that have been accidentally overwritten or reformatted," he said. The key to avoiding these errors, usually human-caused, is to have very good practices and procedures, particularly with regard to when and how tapes are "rotated" back into use. Proper labeling is part of the solution along with "common sense" to supplement whatever guidance is provided by backup software. "Problems often crop up when a new person is assigned responsibility for tape backup without having training or familiarity with your procedures," he said.

When serious problems arise with tape, including suspected overwrites or physical damage to the media, Reinert said it is always a good idea to call in an expert. "Just putting it into the drive and hoping for the best will probably make the problem worse," he said.

However, despite all the warnings about tape problems, Suesens said, "The hard-and-fast reality is that tape is very reliable, has a lower rate of failure than disk and is well-adapted for safer, offsite storage," he said. Still, DeNapoli advises being safe rather than sorry. "You must test!" he said. No matter what backup tool you use, and no matter if it is disk-based, tape-based or a combination of both, testing should be scheduled at least once per month. "Pick random data from both disk- and tape-based repositories and restore it to a file server; examine the files for consistency and make sure they can be accessed or opened as appropriate," he added.

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