



Removable Disk Based Backup and Recovery:

Comparing Removable Disk Backup with Bare Metal Recovery to Traditional Tape Backup

Published: December 12, 2006

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You can't gamble when it comes to protecting corporate data. Security measures have been implemented to protect against intruders and to perform regular backups to let you recover from system failures, virus attacks, or natural disasters. But if you're relying solely on tape backup for disaster recovery, no doubt you've already wondered if you really have the means to get your systems and data back on line before a disaster inflicts serious damage to your business viability. Can you really afford to take disaster recovery risks with your corporate data?

"Data is one of two irreplaceable corporate assets, second only to loss of life," writes Dennis Wenk in an article in the Disaster Recovery Journal (Winter 2004, "Is 'Good Enough' Storage Good Enough for Compliance?"). While comparing data loss to loss of life might seem outrageous, the article goes on to state, "Research has shown that 50 percent of companies that lose critical systems for more than 10 days never recover, 43 percent of companies experiencing a disaster never reopen, and 29 percent of the remaining close within two years. That's the death of a corporation."

Even if you somehow manage to beat the odds and survive with a suspect disaster recovery plan, you might not be so lucky at escaping the consequences of regulatory non-compliance. Recent government regulations such as the Sarbanes-Oxley Act require organizations to have the necessary internal controls in place to protect against risk events. Failure to implement acceptable internal controls can leave businesses and their senior executives liable for up to \$5 million in fines, 20 years in prison, or both. In short, best-effort measures don't cut it anymore. Whether you're concerned about the Sarbanes-Oxley Act, HIPAA, or other government or industry regulations, unreliable disaster recovery practices can add up to significant non-compliance penalties in today's corporate environment.

Tape Backup

Tape has been a de facto standard for backup and recovery for years, but corporations are now realizing that it doesn't have the ability on its own to handle all of their disaster recovery requirements.

Computerworld listed tape backup as one of five submerging technologies, stating that "Although magnetic tape's cost per megabyte will give it a role in keeping archival records for years to come, better technologies and techniques are eroding tape's dominance for day-to-day backup and recovery tasks" (October 20, 2003, "Submerging Technologies: Five that are Sinking Fast" by Gary H. Anthes and Robert L. Mitchell).

Challenges of Traditional Tape Backup Solutions

1. As the data storage and data backup requirements of an organization increase, acquiring an adequate tape backup solution (tape drive and multiple pieces of tape media) can become surprisingly expensive.
2. The performance of tape drives is generally much slower than the performance of the hard disk drives that store a businesses' data. Since it takes a relatively long time to back data up to tape, businesses typically perform tape backups only overnight, which means that during the day data can be lost.
3. The more often a piece of tape media is used, the more likely it is that a business will not be able to recover its data from that piece of tape media, because the media has worn out.
4. The performance and storage capacity limitations of tape technology and the propensity of tape media to wear out have led tape drive manufacturers to recommend that business customers carry out sophisticated daily tape backup routines. These routines require multiple pieces of media and someone to diligently administer the tape backup process.
5. Data recovery from tape often requires multiple tapes and if any one of the required tapes is missing or unreadable the recovery will fail.
6. Hidden Costs of Tape Backup
 - Downtime due to slow restoration speeds
 - Annual replacement cost of tape media – It is recommended to replace tapes every 6-9 months
 - Daily maintenance of cleaning tapes
 - Autoloader maintenance and repair and the downtime this causes

That same article quotes Bob Passmore, a vice president at Gartner Inc., as saying, ““We believe that five years from now, most medium- and large-sized customers will be using snapshots on disk as the primary recovery media. But that doesn’t mean tape is going away in the next 12 months.”

Many industry experts agree that a solid disaster recovery plan incorporates the archival strengths of tape backup. However, many of these same experts point out the logical benefits to having data backed up to disk and point out the short comings of tape backup. Disaster recovery strategies that incorporate disk as removable media play to the strengths of disk-to-disk solutions like Idealstor and iBac, data backup & recovery enable organizations to enjoy the benefits of:

- True Disk-to-Disk Backup Solution - No More Tapes
- Synthetic Full Backup - Conserving Disk Space
- Perform Backup in Native Format - Faster Restore & Immediate Access to your Data – Drag and Drop

- Ejectable Disk Backup Media for Off-Site Storage
- Maintain Near-line Storage & Off-Site Data Archives
- Data Versioning - "On-going Incremental Backups"
- Maintain Immediate Data Availability & Recovery
- Faster backup Rate - Up to 1.4GB Backup Rate & 1.8GB for Restore
- Run Multiple Backup Jobs Simultaneously
- High Availability incase of SQL, Exchange & File Server crash
- Ability to use any capacity SATA disk on the market (up to 1TB as of August 2007)
- Bare metal recovery to dissimilar hardware
- Easy to access data from backup disk – don't need Idealstor appliance offsite

The Case for Ejectable Disk Backup

Ejectable disk backup offers you the speed, reliability and capacity of disk coupled with the portability once only associated with tape based backup. With data increasing and backups windows shrinking, disk based backup has become a must for most organizations. According to TheInfoPro, a New York based independent research firm, more than 75% of 150 large companies recently surveyed said disk-to-disk backup technology is being used in their data centers; this compares to 67% who were implementing it a year ago.

While the adoption rates of disk based backup are increasing, most companies are still stuck with their slow tape backup as the only method to get their data offsite. Known as disk to disk to tape backup or D2D2T, this adds cost and complexity to the backup process and does not solve the problems associated with tape based backup and recovery. Ejectable disk backup allows administrators to backup directly to SATA disks and use them as offsite media.

The Reliability Question

Historically, tape has been seen as the ideal media for storing data offsite because of the cost/GB and ability to easily send this data offsite. Another reason is that some organizations view tape as more reliable than disk and better suited for being sent offsite. Ejectable disk backup is well suited for transporting data offsite and based on our years of experience is a far more reliable media than tape.

Disks by themselves are extremely reliable when it comes to storing critical data onsite or offsite. In order to provide a few extra layers of protection, Idealstor provides a shock absorbant aluminum caddy for each

disk which can be used to transport data or for storage. In addition, each Idealstor disk comes with a rugged carrying case that is packed with anti-static foam to ensure the safety of your media in transport. Outside of these measures, disk inherently provide protections to the media. SATA disks, unlike tape, offer a sealed form of media that prevents particulates from damaging the backup media. In addition, when you eject a disk using the Idealstor disk management utility, we make sure the cache is flushed to the disk and ready for power down and swap. When powered off the head gets parked on a non-written part of the platter to prevent “head slap” from damaging any data. Finally, Idealstor disks are used once a day or once a week. Unlike disk in a RAID that are always spinning, removable disk media is a far more reliable form of disk to use to store data.

Recovering Data from Ejectable Disk

One of the biggest bottlenecks to getting systems back online after a disaster is the restore from tape process. Provided that there are no errors on any of the tapes, complete server restoration can take from eight to twenty hours. The operating system must be reinstalled, along with all of the necessary support packs and server applications. Next, the IT manager can restore the full backup tape baseline, followed by restores from all the incremental tape sets up to the desired point in time.

A traditional server restore from tape includes the following steps:

1. Repair or replace hardware as necessary
2. Find and collect all necessary OS and application media
3. Reload OS from CD-ROM or floppies
4. Reboot
5. Apply service packs in order (generally multiple service packs are required)
6. Reboots (one for each service pack, so multiple reboots are usually required)
7. Reload backup software from media
8. Apply patches to bring the backup software to the current support level
9. Reboot as required by patches
10. Load recovery tape and restore

Even if the restore completes with few incidents, there are typically no guarantees that the server will be successfully returned to its previous working state. Tape drive failures, faulty tape media, and incomplete or corrupt backups all contribute to the unreliability of tape backups. A recent CMP-Reality Research survey stated that 59% of IT managers were concerned about their company’s ability to reliably back up and recover data. Part of the concern is due to the fact that tape is not a sealed medium. Tape media is subject

to dust particles and wear both in office and factory environments. During cartridge transport, they are susceptible to temperature, shock and magnetic fields.

More commonly, the data is not even backed up correctly as a result of human error. This comment is typical of recovery attempts, especially in smaller organizations with no dedicated IT staff. "When we went to recover the data, we found that the backups had not been performed regularly or at all." In these cases there is little to do but start from the beginning and hope that critical data can be reconstructed from corporate systems.

Even under the best circumstances, performing a bare-metal recovery from tape is tedious and very time consuming. Traditional tape backup software has been designed for file backup and recovery. If rebuilding a system were as simple as a file transfer, then file recovery alone would serve the purpose. Including a system's boot structure, file tables, embedded settings and applications requires a more comprehensive approach than traditional file backup tools to enable full bare metal recovery.

Disk-to-disk solutions make the once dreaded task of restoring full bare-metal systems quick and easy. Solutions such as Idealstor Quick System Recovery (QSR) give you the flexibility to restore from the backup server appliance. In minutes, you can roll back your server to the exact state when your last backup occurred—with all system optimizations, hidden files, encrypted files, service packs, and data in place.

Idealstor disk-to-disk backup appliance can reduce server and/or PC restoration times by up to 80% over traditional methods. As indicated earlier, rebuilding a system may involve reinstalling the operating system and applications, and reconfiguring device drivers, which typically takes four hours or longer to complete. However, using the Idealstor Quick System Recovery CD, administrators can boot virtually any bare-metal machine with the Idealstor QSR disk, which auto-detects hardware and loads the appropriate drivers to boot the system and simply restore the complete system or data files in minutes.

Your success depends on your ability to protect corporate data and keep business systems accessible to employees, partners, and customers. On its own, traditional tape backup fails to provide the level of business continuance and data protection that you need. But disaster recovery plans that include both tape and disk-to-disk backup can enjoy the long-term archival strength of tape and the fast backup, and quick and reliable restoration capabilities of disk technology.