



# Achieving Increased Backup Availability and Reduced Backup Windows with Disk-to-Disk-to-Disk



DATA PROTECTION WHITE PAPER

## ABSTRACT

Exponential growth of data and complexities in data protection systems are demanding more time and resources from IT managers. Companies are actively looking for reliable, easy-to-use backup solutions that free-up time and reduce overall costs. Industry-standard SATA disk drives have come down in price to where they now match or are less expensive than traditional tape media. The increased speed of disk-to-disk backup in both backups and restores greatly reduces overall backup cost. One challenge that many companies experience when using a disk-to-disk solution is how to provide archival removal of the data to an offsite location. The solution is removable SATA drives that are designed for transportation and storage at remote locations.

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## Introduction

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Today's data files are an integral component of business. In many cases, these files contain mission-critical information of the business and require 100% accessibility and restorability. This business climate requires a strategy to keep critical data backed up 100% of the time while performing at levels that enable users to complete their business in an efficient, effective manner.

Backup principles are not new. We have been taught them for years and are continually reminded of their virtues. Surprisingly, a survey by Strategic Research Corp. found 75% of companies' "edge data" is still unprotected. The data is either ineffectively backed up or not backed up at all. Edge data resides outside managed servers on remote networks, desktops and mobile systems and ends up being 60% of a corporation's data. This is a risky business practice as edge data can be as critical to the company's survival as its more manageable centralized data.

In most scenarios, regular backups are a time-consuming and tiresome process. In the event that you need to recover data, finding the file to restore is also a hassle — assuming you can even find the right version.

**Legislation:** Further, by not having adequate backup and restore capabilities there is the growing potential legal risk from undocumented communications and non-compliance with government mandates under regulations such as the *Sarbanes-Oxley Act*, *The USA Patriot Act*, the *Health Insurance Portability and Accountability Act (HIPAA)* and the *Gramm-Leach-Bliley Act*. Penalties include imprisonment and heavy fines, some as high as \$204 per individual record, for U.S. businesses that do not meet government regulations relating to the secure archiving of electronic data.

**Tapes:** For over 2 decades now, tape technologies have been the dominant force in backup and recovery. The low cost of tape and the fact that tape cartridges can be easily removed and stored off-site are the medium's most attractive features.

With the projected amount of data that needs to be backed up climbing at a rapid rate, and the projected growth in tape drive units shipped staying relatively flat, each of those

backup tape drive units must deliver more capacity than ever before. Analysts predict that there may be the potential for a melt-down if the backup technology does not keep up with that sharply rising demand curve.

**Disk-to-Disk:** New host-based Disk-to-Disk backup strategies using SATA disk arrays seem to offer the most promise by using low-cost disks and providing increased data transfer speeds for backup and recovery. The use of RAID (Redundant Array of Inexpensive Drives) technology further increases the advantages of disk-to-disk backup by adding redundancy to the backup media. Should one of the disks fail in a RAID array, the data it contains is not lost.

However, just as tape solutions have virtues and deficiencies, Disk-to-Disk SATA disk arrays also have limitations. Selecting an appropriate backup product is an important step in architecting a backup solution that will provide scalability over time. Important factors to consider include the software features, licensing fees, installation and configuration, ease-of-use, and the ability to archive backup data to off-site storage. These combined requirements determine the selection of the most appropriate solution.

## Comparison of Tape and Disk Attributes

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Each of the different technologies being touted today has intrinsic benefits that fit a different scenario better than another. The attributes of each can be argued infinitely but the most common characteristics are described below.

### Tape Backups

Tape backup units typically consist of a tape drive and a tape cartridge. The tape drive contains the drive mechanisms and the tape head, which records to and reads from the tape. The tape cartridge houses the magnetic tape, which stores the data. The actual tape varies in width from 4 mm to 1/2 inch depending on the specific tape technology. Both internal and external tape drives of varying storage capacity are available from a variety of manufacturers.

## Advantages:

- Digital tape libraries remain a cheap form of storage, at about \$0.50 to \$4.50 per gigabyte. However, this advantage has been overtaken by the low prices of SATA drives.
- Easily removable to an offsite location. This protects data from having a single point of failure.

## Disadvantages:

Backup and restore from tape has been a source of consternation for IT administrators for years. For example, when data is actually written to a tape, the info needs to be written sequentially and can't be interrupted or the backup is incomplete. Also, when the tape is being written to, it cannot be read from -- which limits the ability to access files during a backup.

Other notable complaints of tape solutions include:

- Tape failures during backup
- Failed notifications of incomplete backups
- Inability to locate an appropriate or current backup tape
- Inability to make the backup window -- (The time given in which to write all the data to tape.)
- Inadequate restore speeds from tape

A 2003 report by Gartner found that IT departments spend between 20 and 30 percent of their manpower dealing with tape backup problems. Over 30 percent of all storage problems stem from tape backup systems. Another 2003 study by the Strategic Research Corporation found that while tape backups are used extensively, restoring data from a tape backup system fails an astounding 70 percent of the time. The reasons for

such an alarming rate of failure range significantly and may vary from bad tapes or tape drives to the inability to find the backup tapes or careless processing by IT staff.

***"We see one or two tape drive failures every day. To us, it's not super unreliable, but it still has mechanical properties and does break down, which requires manual intervention."***  
**-Steve Curry, architect for storage operations at Yahoo**

Organizations now have better alternatives to traditional backup technologies. New disk-based products are replacing the legacy tape systems with better performing and more reliable systems.

## Disk Backups

Over the past few years, IT administrators have begun to look to disk-to-disk based solutions to solve some of the drawbacks of tape backup and recovery. In order to utilize a disk-based solution, IT administrators were often faced with doubling their total disk capacity to create an online backup, yet still having to further backup to tape for offsite disaster recovery protection. This approach helps solve the problem of backup overruns and tape restore speeds, but still carries a cost that is typically insurmountable. Though RAID technology helped with the problem of redundancy, it did not solve the problems of mistakenly deleted files or disaster recovery. These nightmares of traditional backup soon set the stage for new disk-to-disk technology that could offer the data protection of tape and the performance of disk at a cost that was still in the same ballpark as tape technology.

### Advantages:

- Faster writes of backup data to disk
- Faster restores from disk which meet recovery time objectives
- Familiar RAID storage technology
- Completing the backup during the time allocated

- Aids in meeting legislated requirements for corporations
- Making multiple backup copies
- Responding to individual restore requests
- Reducing operational & mgmt costs
- Managing capacity growth
- Can be both written to and read from at the same time.

At one point, cost was a disadvantage. However, this old notion is no longer true as the price per GB is equal or better across both technologies.

Disadvantages:

- The most prevalent problem with implementing disk-to-disk based backup systems has been the inability to remove drives to an offsite location.
- And even if the drive is removed, most solutions lack the indexing ability to know what is on that drive.
- The inability to scale the disk-to-disk solution for the needs of a growing network.

***Recovery of data in tape-based systems takes about four to five times longer than backing up information with a disk.***

**- Jon Murray of EMC**

## Conclusion

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A Disk-to-Disk-to-Disk appliance, which combines the speed and ease of disk backups with the mobility and security of tape backups, gives companies of all sizes the best advances in storage technology while maintaining the principles of business backup by giving indexing and mobility to their data. Disk-to-Disk-to-Disk appliances come with hot

swappable drives that enable mission critical data can be archived in a safe, offsite location.

It's a good idea to keep some backups physically separate from the systems hosting the active data. Fire, flood, theft and other destructive forces are fortunately uncommon, but must be accounted for nonetheless. This requires a secure, independent location.

Byte and Switch magazine had this observation: "While backup to tape has been the predominant way organizations both large and small have protected their information, new disk-based backup and archival solutions are percolating into the market. These offer the promise of faster backup and recovery times, which would allow a business to recover more quickly in the event its primary storage goes down." Disk-to-Disk-to-Disk appliances provide for just such a recovery by enabling business to store much faster disk drives to offsite locations. Thus when a disaster happens, the business can restore using the archived disk(s) and get back to work many times faster than by using conventional tape.

Another huge benefit for Disk-to-Disk-to-Disk solutions is the overall price when one considers that tapes should be replaced each year. Tape backup software is very expensive, adding additional cost. For example, a 2.6TB tape backup system would include a 26 tape LTO library, costing about \$26,000, with an additional \$10,000 for four weeks of tapes. Then add another \$9,000 to replace the tapes after one year, and \$8,000 for the third year's replacements as tape prices continue to drop. For Windows and/or Unix server software, add another \$25,000. Total cost, without a maintenance contract, is about \$78,000. A comparable Disk-to-Disk-to-Disk solution costs a fraction of that price and offers much better return on your investment.

***"Restoring from a tape backup can take hours or even days as files are uncompressed and transferred back to disk. However, a RAID-based backup can be online as a replacement within minutes or even seconds."***

**- John Webster of the Data Mobility Group**

## Summary

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Backing up a business's data is a labor intensive proposition that is increasingly necessary for all businesses regardless of size. However, once business data is organized, backing it up isn't complicated; it just takes a small amount of discipline to create and stick to a schedule.

Disk-to-Disk-to-Disk solutions provide innovative backup hardware that is worth getting excited about. Whether you are implementing a backup solution for the first time or revamping an existing corporate system, find an expert in Disk-to-Disk-to-Disk to show you the proper way to backup data with a disk solution that is robust and removable.

### Best of Breed Disk-to-Disk-to-Disk Product Features

#### Revinetix product features include:

- Turnkey, single "All-In-One" backup appliance solution
- Capacity License with no site and/or seat fees
- Unlimited number of clients, including physical and VM servers and desktop/notebook computers
- Fully automated disk-based backups
- Full, incremental and differential backups
- Data deduplication for storage optimization
- Remote byte-level replication for DR
- Active Directory support
- Exchange Agent and SQL Agent included
- Message-level restore in Exchange
- Rapid, reliable data recovery with point-and-click interface
- Multiple client editing
- Augments and backs-up existing SANs
- Backs up virtual machines
- Significantly reduced backup times
- Disk-based archive for DR offsite
- Easy implementation and management

- Intuitive, Web 2.0 browser-based GUI
- Support for all major operating systems
- Addresses compliance requirements
- Centralized administration
- Bare Metal Restore software quickly adds new users or gets users back up and productive after a fatal system crash
- Utilizes uncommitted storage
- Lowest TCO backup solution for SME
- Rackmount solutions available 500GB to 70TB in 1U, 2U, 4U & 8U
- Outstanding U.S.-based support
- And much more

## About Revinetix

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Revinetix provides innovative data protection solutions that ensure continuity of business, control of critical information and confidence in recovery systems. Revinetix offers Disk2Disk2Disk® disk backup and recovery solutions with deduplication and replication that allow automated backup schedules for every client on the network and allows critical data to be stored safely off-site from a single disk backup appliance. Exchange and SQL agents included. For more information, contact Revinetix at 888-264-5116 or [sales@revinetix.com](mailto:sales@revinetix.com) to locate a reseller in their local area. Or visit Revinetix at <http://www.revinetix.com>.

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