

# Protecting Server Data in Small and Medium-sized Businesses

## EXECUTIVE SUMMARY

Protecting critical business information stored on servers in small and medium-sized businesses (SMBs) is increasingly challenging. The pervasive use of computer resources throughout business operations not only continues to increase the volume of business data, but also its importance to the SMB's mission. Ensured, rapid access to this data is as important to the success of the thriving SMB as it is to large enterprises.

Further, increasing regulations place greater scrutiny, and potential penalties, on data protection and recovery. Complicating data protection is the fact that it is widely distributed on file/print, email and database servers, with mobile technologies promoting the migration of data throughout the business.

Those charged with the overall data protection strategy and program in an SMB commonly face these challenges:

- Disappointing results in restoring data from current backup methods that, despite the investment of hours of staff time, cannot guarantee that all the data will be available when needed.
- Difficulty meeting Recovery Point Objectives (RPOs) and Recovery Time Objectives (RTOs) for resuming operations and business functions without incurring an expensive loss in staff productivity.
- The struggle to keep business continuity a high priority with limited technical staff — as well as the desire to have these resources focused on more value-driven tasks rather than routine backup chores.
- Limited options for ways to reliably move data off-site so that it is protected from disaster within “commercially reasonable means” required by a wide variety of compliance regulations — but easily recovered when needed.
- No easy way to control all the servers for which they are responsible or enforce standardization of backup policies for the entire business.

This paper presents a framework to assist in examining current methods of protecting server data — as well as the solutions designed to optimize server data protection programs, including:

- Common goals for protecting critical business data on servers — whether they are inside or outside a centralized location.
- The differences between tape-based solutions and disk-based solutions appropriate for the very different needs of SMBs protecting server data.
- Disk-based backup with integrated online services as a viable alternative to tape-based backup solutions for SMBs.
- Key characteristics for the SMB in evaluating disk-based backup with integrated online services.

Finally, this paper outlines the next steps in evaluating an online disk-based backup solution for SMBs.

## **DOCUMENT INFORMATION**

Protecting Server Data in Small and Medium-sized Businesses

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## ABOUT IRON MOUNTAIN DIGITAL

Iron Mountain Digital is the world's leading provider of data backup/recovery and archiving software as a service (SaaS). The technology arm of Iron Mountain Incorporated offers a comprehensive suite of data protection and e-records management software and services to thousands of companies around the world, directly and through a world-wide network of channel partners. Iron Mountain Digital is based in Southborough, Mass. with European headquarters in Frankfurt, Germany. For more information, visit [www.ironmountain.com/digital](http://www.ironmountain.com/digital).

Iron Mountain's LiveVault, our automated server backup and recovery solution, received a 2006 CoDiE Award in the Best Storage Software Solution category. LiveVault is offered as licensed software and managed service and features all of the key characteristics on the checklist provided in this paper. In addition, our PC backup and recovery services and products protect and defend data stored locally on desktops and mobile devices.

## COMMON GOALS FOR PROTECTING CRITICAL BUSINESS DATA ON SERVERS

Today's businesses depend on access to their own information not only to succeed in the marketplace, but first and foremost, to survive in it. The pervasiveness of computing resources in business operations makes access to critical business data imperative. Loss in productivity from downtime is expensive, regardless of the size and resources of a business.

Imagine the impact on a successful advertising agency from losing access not only to its billing, accounting and customer information but also to stored images of successful campaigns essential to closing new business — or the loss of intricate designs and plans critical to the success of a highly competitive transportation or engineering company. Picture the dilemma of an insurance company forced by a local disaster to recreate not only internal data on employees and payroll, but data on customer policies and deductibles. Ensured, rapid access to data is as critical to the success of SMBs (our fastest growing business segment) as it is to large companies — and the cost in lost productivity of downtime and time-consuming recovery efforts is even more devastating.

All businesses need to develop strategies and solutions to protect access to their data in order to achieve these fundamental business goals:

1. Mitigate risk and safeguard their business continuity
2. Demonstrate the ability to successfully and rapidly recover from disasters
3. Control unnecessary costs, from downtime to non-compliance fines and litigation costs, to additional IT resources/time
4. Avoid other penalties of non-compliance (prosecution, damage to reputation/brand)

A number of drivers challenge businesses of all sizes in achieving these goals. The sheer volume of business data on various types of servers (file and print servers, email and database servers) continues to increase, as does its assessed value (as much as \$1 million per 100 megabytes, according to the valuation of many companies<sup>1</sup>).

In addition, this increased volume is being more widely distributed and migrating much more quickly. The growing use of mobile device by a more virtual workforce increases the potential for data loss and misplacement during efforts to create comprehensive backups of the total information inventory of any single business — to say nothing of increased opportunity for security breaches and data theft.

Rising public awareness of information privacy violations and recent scandals in business governance have increased government and non-governmental regulations mandating compliance with corporate controls and accountability throughout the information lifecycle. Compliance is just one of the issues increasing the complexity of managing various classes of critical business information throughout its lifecycle —

## CHALLENGES TO DATA PROTECTION

- The CERT/CC estimates that security events rose from approximately 21,000 in 2000 to more than 5 times that amount in 2003 — and that for every reported event, about four more go unreported
- Penalties for non-compliance with regulations to protect consumer and confidential data range from \$1-15 million in fines to up to 10 years in prison
- A 2005 survey shows that businesses continue to invest in perimeter security devices rather than safeguards for business-critical systems and data
- 30% of businesses do not include storage infrastructure in their corporate security policies and procedures

Source: *Best Practices to Secure and Protect Backup Data*, published by Iron Mountain in partnership with ESG and GlassHouse, 2005.

<sup>1</sup> Based on estimates compiled by companies like Contingency Planning Research and Strategic Research Corporation on how businesses value their data and the impact of its loss.

from mission critical for business continuity to non-current but legally required data. A wide variety of compliance regulations affecting almost every vertical makes every business, regardless of size or complexity as susceptible as the very largest companies. Examples include HIPAA, Sarbanes-Oxley, Gramm-Leach-Bliley and regulations from the FDIC, SEC and NASD as well as at the state level. Many require that companies extend commercially reasonable protection to extend to all of their data, wherever it resides.

To stay ahead of these challenges, businesses need to develop successful data protection strategies and find the right solutions that address each of the four key steps in any data protection workflow. Failure at any one of these steps can jeopardize business continuity, whether a business is protecting data from two servers — or two hundred. These key steps include:

1. *Backup* or replication of critical data on another device
2. *Removal* of replicated data to an off-site location to protect it against man-made or natural disasters
3. *Storage* of replicated data that both protects and organizes data so that it can be easily and quickly recovered
4. *Recovery* of replicated data from storage whenever and wherever needed

### PROTECTING DATA WITHIN THE DATA CENTER — EVOLVING TAPE-BASED SOLUTIONS

Larger companies managing terabytes of server data within their data centers have made significant investments over the years in tape-based data backup and recovery solutions, as well as the staffing and infrastructure required to support them. While they require sufficient resources to manage and maintain, tape backup solutions used in conjunction with off-site tape vaulting services remain one of the least expensive ways for larger companies to store huge volumes of backup data — not only for disaster recovery purposes but, increasingly, to comply with regulatory requirements.

**Staffing and tools to manage tape-based solutions:** Within the data center, trained IT staff long familiar with tape-based backup manage the tasks associated with these solutions: tape cataloging, moving tapes off-site, reviewing logs, troubleshooting, locating tapes for a restore of data, etc. As these tape-based systems have matured, many larger businesses have purchased commercially available tools designed to help control the human error and hardware issues inherent in managing large tape backup operations.

**Off-site tape vaulting services:** To more effectively and efficiently address other steps in their data protection workflow, companies using tape-based solutions often employ the services of off-site tape vaulting services. A recent study conducted by *Storage Magazine* revealed that only 37% of businesses actually test their internal backups regularly, and of those that did, an alarming 77% found they were unable to fully recover data by using traditional backup methods. Off-site tape vaulting services relieve the burden of tape cataloging and offer online tape inventory management tools to help ensure fast delivery times whenever and wherever companies need to recover backup data. They schedule regular inspection of media to ensure its integrity, providing better protection against the dangers of media failure (damaged or corrupted tapes). Off-site tape vaulting services test and ensure the recovery of critical data in case of disaster — important in demonstrating compliance with regulations on information storage and protection.

**Evolution of hybrid solutions:** With the introduction of new disk technologies, backup strategies have evolved to take advantage of both disk and tape-based solutions. Many larger companies are moving to hybrid technologies that combine disk-based solutions with existing tape backup processes. Disk-to-disk-to-tape<sup>2</sup> solutions and Virtual Tape Libraries<sup>3</sup> both allow companies to increase the performance of backups by writing to disk during a convenient time (e.g., evening backup windows) and then writing to tape from the disk rather than from the production server. Hybrid solutions may offer faster restoration of recent history because they cache it locally.

## PROTECTING SERVER DATA *OUTSIDE* DATA CENTERS — DIFFERENT NEEDS, DIFFERENT RESOURCES

SMBs share many of the same fundamental goals as larger businesses in protecting business data, but there are significant differences between the data protection workflow inside a data center and the workflow at most SMBs:

- **Lower volume of server data.** As discussed previously, it's the storage cost of their terabytes of data that drives continued investment in tape backup technology by larger companies. But most SMBs measure their data in gigabytes, not terabytes, with critical applications like accounting, customer information and email running a fraction of the number of servers. In fact, the majority of smaller businesses are managing one to three servers.
- **Fewer technical staff.** It takes significant time to complete nightly (let alone more frequent) backups or effect full-scale recovery with technologies like tape-based solutions. Most SMBs would prefer to focus the talents of their technical staff on value driven tasks that more directly affect productivity (e.g., network architecture, application performance) and profitability.
- **Less expertise in very small SMBs.** In very small businesses, data protection responsibilities may be assigned to "generalists" ranging in rank from the principal of the business to administrative support staff. They typically work with less than well-defined processes and often lack the cycles given the balance of their other duties. Evaluating the success of a backup and troubleshooting results require expertise that may not be available on staff. Backup may not be perceived as a strategic, value-added activity — if not given the attention it requires, backups may be being neglected or forgotten.
- **Vulnerability from backups that remain on-site.** The lower volume of data previously cited may also limit the options for SMBs in getting backup data off-site — as well as adding yet another step to the workload of limited staff. As long as it is on-site, this data remains vulnerable to both man-made and natural disasters (including human error).

When these factors characterize an SMB's data protection workflow, tape-based solutions are less likely to be a good fit in achieving compliant or even acceptable data protection goals. Yet the need for adequate data protection and disaster recovery and avoidance of expensive downtime is every bit as critical for these businesses as for large enterprises. SMBs require one, low-overhead solution that addresses each step in their data protection workflow — backup, removal, storage and recovery — and does so effectively within their resource constraints.

<sup>2</sup> In disk-to-disk-to-tape solutions, companies increase the performance of backups by using a disk backup device to store from days to about a week of short-term data before sending it to tape for off-site storage and archiving. Obviously, during the time this data resides on the disk, these companies also achieve faster restoration of this short-term data, depending on the quality of the disk-based solution.

<sup>3</sup> Virtual Tape Libraries allow businesses to keep a few days worth of backups on disk locally, as well as offload tape writing from the production servers. VTLs use traditional backup software to backup full data files to disk instead of tape (the software sees the disk as a tape autoloader and, subsequent to writing data to these disk devices, the software then writes it out to tapes which are then transported off-site.)

## DISK-BASED BACKUP AND RECOVERY WITH INTEGRATED ONLINE SERVICES — A VIABLE ALTERNATIVE FOR SMBs

It is not surprising to learn that more than 37% of small and medium-sized businesses have already deployed disk-based backup solutions — and nearly another one-third are considering it now.<sup>4</sup> These solutions include disk-based backup and recovery with integrated online services.

**What are they?** As their name implies, these integrated solutions combine a local disk device with an online backup and recovery service accessed through a broadband Internet or WAN connection. Backups occur automatically on a nearly continuous and/or scheduled basis, depending on the solution. Data is compressed, encrypted and transmitted to an off-site data storage vault, and optionally, an on-site disk backup appliance. Data restores can occur online or from the local disk backup appliance.

These solutions not only relieve staff of the effort of learning complex procedures and the time to manage additional technologies like tape or tape-disk hybrids, but they also make the process of backup and recovery automatic: “set-it-and-leave-it.” The quality of backup and recovery in the use of disk-based systems is higher as well. In contrast to the *Storage Magazine* study previously cited, 83% of small and medium-sized businesses recently surveyed by the Enterprise Strategy Group have reported that 80-100% of disk-based backups and recoveries are successful. Disk-based systems that allow more continuous backup promote faster, timelier recovery with less data loss.

In addition to increased reliability and ease of use, lower costs for both disk technology and bandwidth are helping to accelerate the adoption of online backup and recovery solutions.

**More than just backup and recovery.** One of the biggest benefits of these solutions offer to SMBs is that they address not only backup and recovery, but their online capabilities also reduce the burden of removing the data and storing it safely off-site, protecting it from local disasters. Online disk-based backup and recovery solutions simplify all steps in the data protection workflow, providing a higher level of reliability, productivity and cost containment throughout the entire process.

**Methods of implementation.** Solutions for disk-based backup with integrated online services can be implemented in two ways:

1. SMBs with T1 lines can subscribe to these solutions offered as managed services by reliable third parties. This allows them to work within their resource constraints, leveraging the service provider’s investment in technology and storage resources while enjoying local control and rapid recovery.
2. Larger businesses with data centers can install solutions offered as licensed software products and offer disk-based backup as an online service to their own remote offices. Note: Data centers gain an additional benefit from this product in backing up certain categories of their own critical data to disk for improved RTO/RPO, an example of the hybrid disk-based technology mentioned previously.

## KEY CHARACTERISTICS FOR THE SMB IN EVALUATING DISK-BASED BACKUP WITH INTEGRATED ONLINE SERVICES

Below are some of the key characteristics to look for when evaluating online disk-based backup and recovery solutions to protect your server data — along with a checklist to help you separate the “best” from “the rest.”

**Comprehensive and reliable data protection.** To help SBMs meet RTO and RPO objectives, most disk-based solutions replace traditional nightly backup techniques with a more continuous form of data protection. Different solutions offer a variety of techniques to save copies of changed data to a protected disk, giving the user varying degrees of ability to recover to specific points-in-time.

<sup>4</sup> Reported by the Enterprise Strategy Group, an industry analyst firm. These figures include all forms of disk-based solutions, not just those with integrated online services.

In order to achieve comprehensive and reliable backup that will deliver the kind of granularity you need at recovery time, there are some key features to look for in a solution:

- Delta change engines that transmit only the data that changes in files and databases — a highly efficient approach that minimizes both server load and bandwidth usage and optimizes fast recovery; they may also offer snapshots and filters to reduce the impact on system performance.
- The ability to save those changes to an off-site location via an integrated online service.
- An efficient way of rolling up point-in-time windows and coalescing them into more comprehensive timeframes — for example, multiple backups within a day into a single daily backup; multiple daily backups into monthly backups, etc.
- Checkpoint or point-in-time restart capability that automatically ensures that backup and restore jobs survive node failures and network resilience problems.
- Built in protection (native support) for open files and databases — representing some of your business's most important data — enables backup of these files while they are in use, without disrupting your business flow.
- Make sure the solution not only backs up data but also allows you to back up *system information* — for easily restoring a full system when on-site technical staff is limited.
- The solution should offer customers flexibility in defining retention scheduling *and* policies for data on a per server or per folder basis, so that certain categories of data (e.g., financial) may be retained for years and but others (e.g., CRM) for shorter timeframes.
- A multi-tier architecture that allows greater freedom to drag and drop jobs onto redundant vaults — e.g., through RAIN technology (Redundant Array of Independent Nodes) that can provide fully automated data recovery in a local area network.

**Ease of use.** A fully automated disk-based backup and recovery solution requires minimal or no technical staff involvement — and allows remote server management from one location when desired for larger, multi-location SMBs.

- The service should be offered 24x7x365 to ensure backups are automatically performed accurately and completely around the clock — and transparently to the customer.
- Automated alerting should replace the requirement for users to manually monitor backup and recovery processes.
- When they choose to, authorized users should be able to manage and monitor the entire backup and recovery process anywhere and anytime. Online Web-based management should make it easy for the user to:
  - Create customized backup policies
  - Check status, audit jobs and users
  - Initiate restore operations
  - Retrieve all versions of data quickly through Web UI from catalog of historic versions
  - Create roles-based access levels for different types of users
  - Control archival requirements to ensure compliance with corporate and regulator guidelines

- The initial setup of the solution should be as painless as possible — not so complex that it requires special staff or a long time to learn and configure, as for example, solutions requiring additional products to extend and complete them or involving numerous components installed at various locations, adding additional steps to the set-up process. Ask references for their experience in deploying a particular solution.

**Efficiency and speed.** There are specific communications and storage techniques that facilitate fast recovery and promote cost control in disk-based backup and recovery.

- Previously mentioned as a feature under *Comprehensive and reliable data protection*, delta change engines transmit only the data that changes in files and databases, allowing recovery of a current version within minutes of a failure. Conversely, solutions that recopy entire files or require full system scans to detect changes will not be as efficient or fast.
- Bandwidth throttling with flexible scheduling allows businesses to control the amount of bandwidth used during any specified time to take better advantage of their existing infrastructure and minimize the impact backups have on other applications.
- Some solutions offer an optional appliance for local disk-speed recoveries of current data and recent history for recovering large amounts of data while meeting stringent Recovery Time Objectives.

**Highly secure communications and storage.** The level of security characterizing the disk-based backup and online service solution you choose is obviously critical to the success of your data protection strategy. Online service entails not only secure communications but also secure storage for data moved off-site.

- Look for resilient, efficient and secure communications provided over public and private connections both at the source where backup occurs *and* in transit to off-site storage.
- The type of encryption used (e.g., 256-bit AES encryption) should be clearly stated.
- At the source, data should be encrypted with a unique key defined by the customer. It's risky to rely on systems with only a single, massive key for entire vault (e.g., those reliant on checksums).
- To guard against forgetting or losing encryption keys, some solutions offer a password-protected, user-changeable, human-friendly encryption key built on top of machine-readable encryption key. As additional protection, there may be the option to escrow the key with the vendor.
- In transmitting the data, look for solutions that use the Secure Socket Layer (SSL) to establish a resilient, secure communication tunnel as the data travels to off-site storage.
- Finally, solutions that allow users to audit access to their administration management system provide added security as well as change control.

**Vendor expertise and flexibility.** Reliability is not only a technical attribute. There are other important questions that should be asked of any server backup and recovery solution provider, that will help you evaluate their reliability so that you can select them with confidence:

- A managed service should be staffed by seasoned professionals who can provide proactive identification and solution of problems as they arise, without requiring the customer to monitor backup and recovery.
- Does the service provider guarantee successful data recovery in writing, for example, through an SLA?
- To what extent are data protection and storage the vendor's core competency? Ask the vendor how many millions of files their solution has restored to date — with an estimate of their recovery success rate. At a minimum, they should be able to specify the number of sites at which their solution has been deployed and how long they have been running.

- Ask for a list of reference accounts to learn more about customers' experience with set up, implementation, and successful recoveries.
- The stability of the vendor's business is as important as the reliability of their solutions — particularly for service providers entrusted with all four aspects of your data protection workflow. Do their solutions address each step in that workflow: backup, removal, storage and recovery?
- Do they offer flexibility of choice through adjacent data protection and storage services that fit together with their server backup and recovery solution? For example:
  - Off-site tape vaulting services (which may already be used by the data center in larger businesses)
  - PC backup and recovery services and products that protect and defend data stored locally on desktops and mobile devices that may be lost or stolen
  - Protection and storage services for critical business information in various non-digital formats (e.g., paper and film) that must also be addressed by the business's data protection strategy to ensure regulatory compliance
- Managed services should offer simple, predictable pricing, with a guaranteed cost based on the amount of data to be protected on the customer's servers — rather than a variable cost that changes month to month based on circumstances outside the customer's control (changes in data compression, data change rate, success of backup, etc.).
- Use of a managed service from a third party offers instant scalability and requires no capital investment for most SMBs. Larger multi-location SMBs managing remote servers may find it more cost-effective to obtain the solution as a licensed software product they install and manage themselves from a centralized location.
- In a licensed software product, look for a comprehensive solution with all the pieces developed by a single source — rather than a patchwork of partial solutions that require one another to address the full data protection workflow needs of the customer.
- Licensed products should not feature an excessive number of à la carte components — look for a comprehensive solution that addresses all parts of the data protection workflow, to avoid extra hidden cost.
- Avoid another source of hidden cost by ensuring that the solution does not require third party solutions to be added in (e.g., look for *native* support for open files and databases without complex plug-ins or costly third party tools).

## NEXT STEPS IN EVALUATING DISK-BASED BACKUP FOR SMBs

This paper has examined both the goals and the challenges for successfully protecting server data outside of a centralized data center, focusing on the specific needs and requirements of SMBs. Solutions that combine disk-based backup with integrated online services offer these businesses a viable alternative to traditional tape-based backup solutions. They address all the steps in the data protection workflow so that SMBs can achieve a higher level of reliability, productivity and cost containment than is possible with more traditional backup methods.

**Review your data protection strategy.** Before undertaking an evaluation of these solutions, carefully review your overall data protection strategy. Simply to remedy an incomplete or expensive data protection program will not suffice unless it is done within the context of an overall business strategy. A piecemeal solution is no solution when it comes to data protection. A handy summary of *Best Practices to Secure and Protect Backup Data* is available on the Iron Mountain site.<sup>5</sup> These are grouped within five fundamental areas: assigning accountability, assessing risk, developing a data protection process, communicating the process and, finally, executing and testing the process.

**Check out online resources.** Iron Mountain's Web site also features real-life case studies of how other businesses have addressed their server data protection needs. Technical briefs and business advisories cover specific topics which may be of particular interest to you — for example, protecting open databases and files during disk-based backup, or securing protection specifically for Exchange servers.

**Use the checklist.** When you have reviewed your data protection strategy and learned about the best practices that characterize data protection practices and solutions, use the checklist provided above to identify the server backup and recovery solution that meets your specific needs. For additional information and assistance, please contact your Iron Mountain representative or email us at <http://www.ironmountain.com/US/contact/>.

<sup>5</sup> <http://www.ironmountain.com/US/digital/resources/>



745 Atlantic Avenue  
Boston, Massachusetts 02111  
(800) 899-IRON

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