Tivoli® software

Next-generation data protection for midsized companies.

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Introduction

Just because your company isn't a major corporation with hundreds of offices and thousands of employees doesn't mean you're not under the same pressures to maintain access to critical information in order to run your business and remain competitive. But buying the same complex and expensive solutions as the major players in your industry can be cost-prohibitive—and unnecessary. The purpose of this white paper is to provide an overview of next-generation data protection and recovery options that are designed and priced specifically for small and midsized businesses (SMBs).

What is next-generation data protection?

Next-generation data protection, or NGDP, is a term that describes a large number of disk-based backup and recovery technologies, including disk-to-disk (D2D), virtual tape library (VTL), snapshots, continuous data protection (CDP), remote office backup consolidation (ROBC), bare machine recovery (BMR), disaster recovery (DR), wide area file services (WAFS) and others. NGDP solutions target the replacement or augmentation of traditional tape backup processes to help meet increasingly aggressive recovery point and recovery time objectives, as well as to help improve operational efficiency, business continuity and resiliency.

For example, when running a tape backup once a night, you may be risking the loss of up to 24 hours worth of data—your recovery point is, at best, the time of the last backup, assuming the backup completed successfully. Many applications need to be stopped in order to run a tape backup, which can negatively affect operations and require staff to be at work or on call in case something goes wrong.

Next-generation data protection takes advantage of the ever-increasing capacities and decreasing costs of hard disk storage.

Recovering data from tape backups can also be problematic. First, you need an experienced backup administrator to conduct the recovery, because recovering anything from tape can be a complicated process. Next, the right tapes will need to be loaded and read in the correct order. If you are running a typical weekly full backup with incremental backups during the week, you may need to read six or seven tapes in order to recover all the latest data. Your recovery time may be measured in hours or even days, assuming the backup tapes were created successfully.

Next-generation data protection takes advantage of the ever-increasing capacities and decreasing costs of hard disk storage, and can be used to address challenges such as improving your recovery point objective (RPO) and recovery time objectives (RTO) by performing fast, non-disruptive backups, and by performing data restoration using the direct, random access dynamics of spinning disks.

Understanding the whole problem

Any comprehensive data protection solution is going to involve a lot of considerations and contingencies. There are many things that can go wrong with your data, and you need to be able to respond to each:

- **Accidental or malicious deletion of critical data:** You should have a solution that can quickly and easily restore individual files and folders. Restoring an entire system when you only need a single file is a waste of resources and could be disruptive to operations.

- **Data that is lost or corrupted over a period of time:** Not all data loss incidents are noticed immediately, as is often the case with virus and hacker attacks, or rolling database corruptions. You should have the ability to recover data from any previous point in time, and have it as granular as possible.

- **A crashed disk:** Recovering a disk volume is different than recovering a single file, but it should be done just as quickly, and with automation to help keep operational disruptions to a minimum.

- **A server failure:** The ability to restore operations when replacing a broken server may be complicated by the need to install different drivers on the new system if the hardware is not an exact match. You should have the capability to temporarily move the application workload to a standby server (with different hardware) or virtual server while the system is being replaced or repaired.

- **A local or regional disaster:** When you lose an entire office to fire, flood, or other disaster, it is critical that you have a current copy of your important information in another location that is outside the disaster zone. It's important to know how fast can you fail over, and whether you can fail back when the office re-opens. You also should know how much standby server and storage capacity you would need in order to handle a disaster.

- **Backup risks in remote offices and branch offices:** Remote and branch offices often don't have the luxury of having an on-site technical resource to assist in backups and restores. Running backups incorrectly, or not at all, is the primary cause of failed data recoveries in remote offices.

- **Resource-intensive backup processes:** The protection of critical data — data you really cannot afford to lose or to be without for an extended period of time — requires frequent or even continuous backup. But this level of protection comes with added costs. Applying a similar policy to non-critical data, such as typical office files, can add undue storage, bandwidth and labor costs. That may be acceptable for large enterprises but may not be for midsized organizations.

- **Security breaches:** When moving data between sites, it needs to be protected from potential security breaches. A breach of data security, whether actual damage is done or not, can be devastating to your company's reputation, as dozens of large enterprises and government agencies have found in recent years.

IBM Tivoli Storage Manager FastBack offers an integrated, cost-effective, next-generation data protection and recovery platform for organizations of all sizes.

Many companies have opted to purchase several point solutions from different vendors to fully address these challenges, which can be an extremely expensive approach in terms of acquisition, integration and ongoing management costs. Other companies have decided the cost is too high and decided to take their chances, which is an approach that has often resulted in disaster. In today's business environment, the loss of important data can cause significant damage and may even lead to the demise of your business.
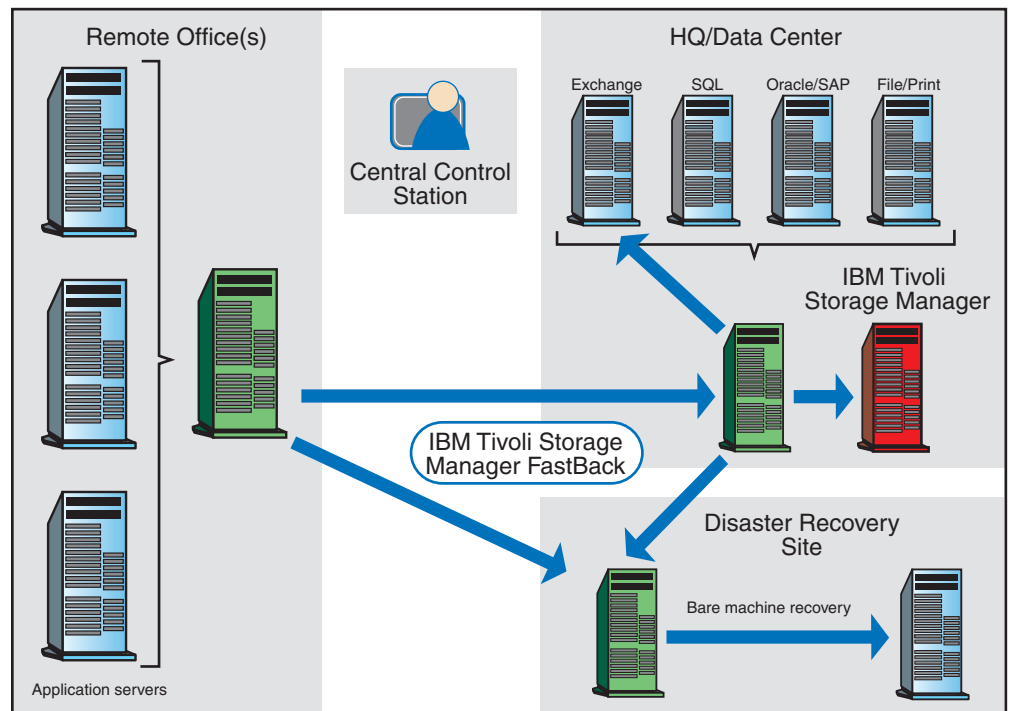
Next-generation data protection and recovery from IBM

IBM Tivoli® Storage Manager FastBack™ offers an integrated, cost-effective, next-generation data protection and recovery platform for organizations of all sizes, and is especially suited to mid-market companies. Tivoli Storage Manager FastBack performs block-level incremental data capture using a policy engine that allows you to tailor your data protection system to meet the needs of individual applications, offices and the business as a whole.

- **Block-level data capture:** File-level data protection solutions need to scan the entire file system to figure out what has changed since the last backup. This can be extremely time-consuming and a major drain on processor power, especially in systems with millions of files. File-level solutions also copy entire files when they've been changed, even if only one record in a multi-gigabyte database has been added or changed. Our block-level technology captures only changed data blocks as they are written to disk — there's no need to scan the file system or copy entire large files. An entire backup cycle can take just a few minutes rather than hours or even days.

- **Incremental data capture:** After performing an initial full backup, Tivoli Storage Manager FastBack captures only changed data and builds a synthetic full copy of the protected data. This can help save storage space, reduce the load on application servers, and eliminate the need to run full backups on weekends.

- **Policy-based protection:** Applying a "one size fits all" solution to complex data protection and recovery requirements can be a waste of valuable resources. Our sophisticated policy engine lets you match the frequency of backup, up to and including continuous data protection, to the needs of each individual application. For example, you can set policies to protect a mission-critical database application every 10 minutes, your e-mail server every hour, and the file server once per day.

- **Granular recovery:** Tivoli Storage Manager FastBack provides a file system view of the data in the backup repository. Open or restore any file or folder, from any point in time, with just a point-and-click or drag-and-drop. Individual users can be given the ability to recover their own files, as well. The solution also offers an optional component, IBM Tivoli Storage Manager FastBack for Microsoft Exchange, which can be used to recover individual e-mail messages, contacts, calendar items, notes and tasks, even from corrupted Exchange databases (EDBs).

- **Near-instant restore:** When an entire volume or system needs to be restored, Tivoli Storage Manager FastBack makes the full data set available within a few seconds, usable by both applications and users, while the data is restored in the background. Any requested interactions with the data are serviced through the repository until the data is restored in full. Downtime is all but eliminated.

- **Selective replication:** Moving a copy of your data over a wide area network (WAN) link, so that it can be restored in the case of a local or regional disaster, can cost a large amount of bandwidth using common synchronous and asynchronous replication solutions. Even if a file is changed hundreds of times a day, every change written to disk is sent over the WAN with standard replication. Using the policy engine described above, Tivoli Storage Manager FastBack sends only the blocks that have changed since the last replication job.

- **Dissimilar hardware bare machine recovery (BMR):** The ability to quickly get a new server up and running, even if the hardware platform is significantly different from the server being replaced (including virtual machines), can be key in deploying a cost-effective and easy-to-manage business continuity solution. Rather than needing a standby server assigned to every critical server in the company, you now only need to have enough to cover the worst possible contingency. For example, if you have ten regional and local offices and assume that only one might go off-line at a time, you need to have only enough servers standing by to cover the biggest office. This technology can also be used for migrating workloads from legacy servers to new platforms, and can reduce migration times by as much as 50 percent over traditional migration processes.

Figure 1: Backup and recovery with IBM Tivoli Storage Manager FastBack

An extensive data protection and recovery portfolio

Tivoli Storage Manager FastBack can help meet the data protection and recovery needs of companies of all sizes. The Tivoli Storage Manager FastBack portfolio includes the following components:

- **IBM Tivoli Storage Manager FastBack:** This core application provides a continuous data protection and recovery management platform for Microsoft® Windows® servers, both in the data center and in remote or branch offices, as well as the movement of backup data between sites (see Figure 1).

- **IBM Tivoli Storage Manager FastBack for Microsoft Exchange:** This optional component provides users and administrators with the ability to recover Microsoft Exchange data objects quickly and easily, from individual e-mail messages and attachments to entire Exchange databases.

- **IBM Tivoli Storage Manager FastBack for Bare Machine Recovery:** This optional component enables complete systems recovery following a disaster or catastrophic server failure, providing the flexibility of recovering to dissimilar hardware or to a virtual machine within an hour.

- **IBM Tivoli Storage Manager FastBack Center:** This solution combines the functionality of Tivoli Storage Manager FastBack, Tivoli Storage Manager FastBack for Microsoft Exchange and Tivoli Storage Manager FastBack for Bare Machine Recovery in a bundled solution that is easy to acquire and deploy.

The Tivoli Storage Manager FastBack family of products integrates seamlessly with IBM Tivoli Storage Manager to provide organizations with a complete data protection, archive, retention and recovery solution.

Mission-critical application protection and recovery

Tivoli Storage Manager FastBack can be used in any of your offices that rely on mission-critical applications. Backup jobs can be scheduled as often as needed to meet the recovery point objectives of each application. Recovery of any data asset, from a single file or folder to an entire volume, from any previous point in time, can be accomplished within a few minutes.

Tivoli Storage Manager FastBack provides block-level incremental data capture, eliminating the need for backup windows.

With the block-level incremental technology in Tivoli Storage Manager FastBack, backup windows are no longer required, so operations are not interrupted to complete backup jobs. The lightweight agent is application-aware, puts minimal load on your production servers, and is especially effective in protecting virtual machines where processor cycles are a critical resource.

If you choose to keep your tape backup and archiving system, such as IBM Tivoli Storage Manager, it can easily be configured to perform backups of the Tivoli Storage Manager FastBack repository, running it anytime during the day without impacting production or backup operations. This is because the tape backup operation would be mounting a previous point-in-time data set and accessing only the Tivoli Storage Manager FastBack backup server.

Granular e-mail object recovery

Tivoli Storage Manager FastBack for Microsoft Exchange enables the recovery of individual e-mail messages, calendar entries, contacts, notes and tasks (see Figure 2). All object attributes are maintained, such as the date and time a recovered message was sent. Tivoli Storage Manager FastBack for Microsoft Exchange uses a familiar interface that allows you to drag-and-drop selected objects to a .pst file; or you can select to send the recovered items using the Simple Mail Transfer Protocol (SMTP) interface. Tivoli Storage Manager FastBack for Microsoft Exchange will even allow you to recover non-damaged items from a corrupt Exchange database (EDB). When used in conjunction with Tivoli Storage Manager FastBack or IBM Tivoli Storage Manager for Mail, you can recover e-mail objects or an entire EDB from previous points in time.

Figure 2: E-mail object recovery with IBM Tivoli Storage Manager FastBack for Microsoft Exchange
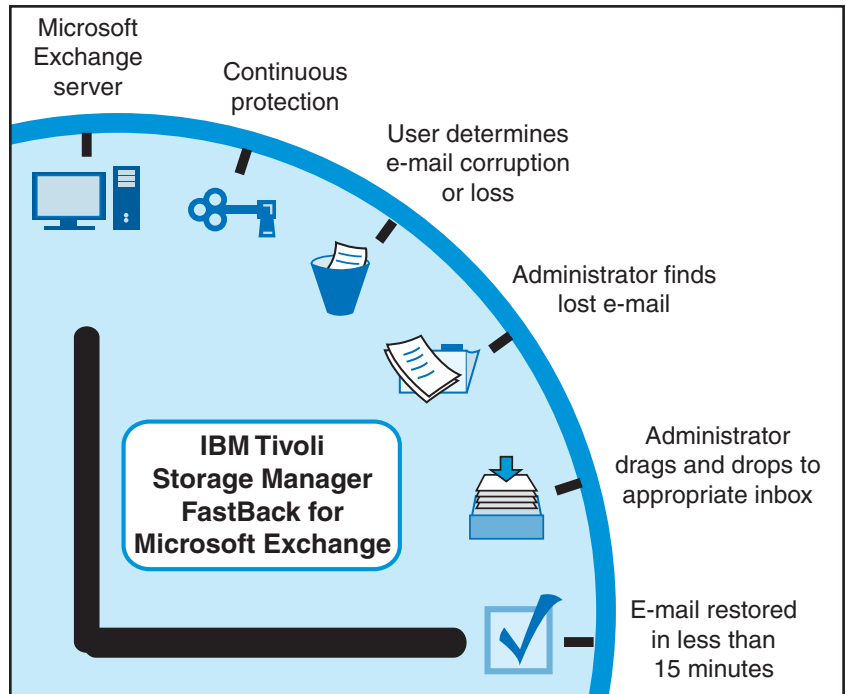
Highlights

Tivoli Storage Manager FastBack enables off-site disaster recovery, with policy-based and bandwidth-efficient data capture.

Off-site disaster recovery

Tivoli Storage Manager FastBack extends disk-based, block-level incremental data capture to a repository in another location, sending changed blocks of data over a WAN or Internet connection. Scheduling and retention policies can be set individually for each location to meet the specific needs of the business, while avoiding unnecessary costs in bandwidth and storage.

With Tivoli Storage Manager FastBack, you can still recover any data from any point in time to get your operations back up and running quickly, even if an entire office or region is affected by an event such as a hurricane, flood, earthquake or even a widespread power outage.

Tivoli Storage Manager FastBack was designed to be as bandwidth efficient as possible to help minimize the impact on other applications that rely on WAN and Internet links. A primary feature in addressing this goal is the policy engine that schedules replication sessions. In most cases, a once-a-day transfer of changed data is sufficient for DR protection, especially if local backups/snapshots are occurring frequently during the day. A once-a-day policy will transfer only the blocks that have changed since the previous day, and only the latest version of that block will be transferred even if it was changed hundreds of times during the day—which is common with database applications. The transfer can be scheduled to occur in the middle of the night when other WAN traffic is at a minimum. Consider this in contrast to common replication products that copy everything that is changed, clogging up bandwidth on a continual basis.

Other performance features in Tivoli Storage Manager FastBack include data differencing (sending only the changes from the previous job run), compression, bundling of small files to help reduce TCP/IP overhead, bandwidth throttling and multi-threading.

Adding Tivoli Storage Manager FastBack to your data protection program can help eliminate a large set of operational costs, including the purchase and management of tapes, transporting and storing them off-site, as well as all of the manual processes associated with tape-based solutions. It can also help mitigate the security risks of physically transporting tapes, including the inadvertent loss of portable media.

Business continuity and resiliency
Tivoli Storage Manager FastBack for Bare Machine Recovery is an extremely cost-effective solution for quickly restoring the operations of an application server within an hour when the entire server or the office where it's located goes down (see Figure 3).

Tivoli Storage Manager FastBack for Bare Machine Recovery enables a cost-effective disaster recovery strategy that requires a minimum of standby hardware.

In addition to helping eliminate the need to have a one-to-one ratio of identical standby servers to fully cover your assets, Tivoli Storage Manager FastBack for Bare Machine Recovery can also be used for server migrations and for moving applications from a test environment to production—without worrying about the hardware being used in each department. The automated features of Tivoli Storage Manager FastBack for Bare Machine Recovery helps reduce the risk of introducing problems into new systems as they are brought online.

With this dissimilar hardware capability, this solution is ideal for moving application workloads between physical and virtual servers. Tivoli Storage Manager FastBack for Bare Machine Recovery has been tested and verified with both VMware® ESX Server and Microsoft Virtual Server.

Figure 3: Server restoration with IBM Tivoli Storage Manager FastBack for Bare Machine Recovery
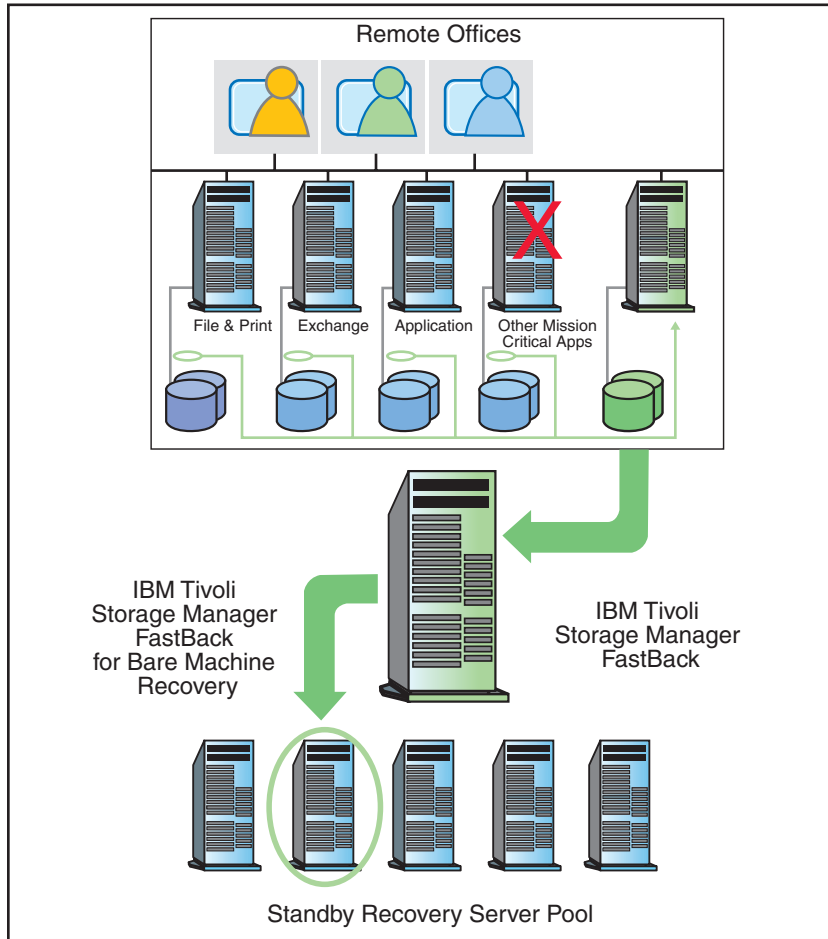
Tivoli Storage Manager FastBack can replace the use of tape in remote offices, automate data protection tasks, and centralize management processes.

Remote office data protection and backup consolidation

Too often, remote and branch offices do not have qualified technical staff on-site to support the needs of users and applications, and effective data protection processes are often lacking. Tivoli Storage Manager FastBack offers a very cost-effective solution that can replace the use of tape in remote offices. It can automate the process of protecting data in remote offices, and all management can be easily accomplished by central office IT staff using the Web-based management console.

There are literally dozens of solutions that have been introduced in recent years to automate and consolidate the backup processes in remote offices. While others offer point solutions for remote offices, Tivoli Storage Manager FastBack provides an integrated solution for next-generation data protection and recovery for the entire organization.

Measurable improvements in support operations

Companies from a wide variety of industries have leveraged Tivoli Storage Manager FastBack to improve backup and recovery performance, measuring dramatic improvements across a diverse set of support tasks. The Tivoli Storage Manager FastBack family of products can help organizations:

- Reduce server backup times from hours or days to a few minutes.

- Reduce server volume restoration times from hours or days to a few minutes.

- Increase backup frequencies from once per week to multiple times per day, without disrupting operations.

- Enable rapid recovery of granular Exchange objects that are typically too difficult—if not impossible—to recover.

Conclusion

The Tivoli Storage Manager FastBack family of products can provide organizations with a comprehensive, enterprise-class, next-generation data protection and recovery solution set at mid-market prices. These solutions can help companies reduce operational risk and costs, increase productivity and resiliency, and provide improved levels of service.

For more information

To learn more about IBM Tivoli Storage Manager FastBack, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/tivoli

About Tivoli software from IBM

Tivoli software offers a service management platform for organizations to deliver quality service by providing visibility, control and automation — visibility to see and understand the workings of their business; control to effectively manage their business, and help minimize risk and protect their brand; and automation to help optimize their business, reduce the cost of operations and deliver new services more rapidly. Unlike IT-centric service management, Tivoli software delivers a common foundation for managing, integrating and aligning both business and technology requirements. Tivoli software is designed to quickly address an organization's most pressing service management needs and help proactively respond to changing business demands. The Tivoli portfolio is backed by world-class IBM Services, IBM Support and an active ecosystem of IBM Business Partners. Tivoli clients and Business Partners can also leverage each other's best practices by participating in independently run IBM Tivoli User Groups around the world — visit www.tivoli-ug.org

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