



# Business Continuity

In today's 24/7 business world, a service interruption could threaten a company's profitability and viability. This has elevated storage management to a cornerstone technology in business continuity plans, and has pushed IT professionals to seek out both cutting-edge solutions and cost-efficient approaches to secure critical data and keep the business running.

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## Executive Summary

Whether your company does business exclusively or primarily in a web-based environment, or still operates primarily using a traditional batch approach, undoubtedly your most critical information is held on storage systems. Customer records, sales transactions, marketing campaigns, employee records, intellectual property... all this data and other types of information reside in a digital format. And when disaster hits, the impact on your organization can be nothing short of catastrophic.

Virtually every midsize and large organization is likely to have at least some kind of plan to ensure the ability to recover and restore the key data necessary to continue business operations after an outage. But not every company is as vigilant as it should be in evaluating, refreshing or overhauling its approach as business conditions change. If you don't have confidence that your current business continuity plan will effectively recover and restore critical data after a service interruption, you need to update your storage management solutions as an essential first step. For obvious reasons, your company can't afford to be offline for very long, because every minute your systems are unavailable you're losing money and putting your company at risk.

This white paper explains some of the storage technology options available to you when you are planning to strengthen your business continuity solution. In particular, this report is designed to help expand your understanding of the critical role that storage management software plays in helping you withstand and recover from a systems outage.

## Market Overview

The explosion in business data, the diversification of rich-media data formats, the expansion of electronic commerce, the proliferation of regulatory compliance and e-discovery, and the always-available requirement for businesses are vital reasons why a vast majority of companies have developed some kind of business continuity plan. In fact, according to ABI Research, the global market for business continuity and data recovery will grow from more than \$25 billion in 2010 to more than \$39 billion by 2015.<sup>1</sup> IT organizations of every size and type are developing, updating or overhauling their business continuity plans — in some cases, this simply means dusting off plans that have been sitting on a shelf for a few years, or in the best cases, working to deeply embed their plans into day-to-day operations and business processes.

Within these large market projections are a host of expenditures for everything from servers, RAID-based disk arrays and networking hardware to applications and professional services. But at the heart of the business continuity mandate is data storage — especially storage management software. More and more information must be recovered in the event of an unplanned outage — either from a natural disaster, a cyberattack, acts of terrorism or user error. But simply recovering data isn't enough; it must be restored to its actual state the nanosecond before the interruption took place, and organizations must be able to resume operations immediately. If not, they risk losing millions, maybe even billions, of dollars in sales and profits — or worse. Whatever an organization's current state of readiness may be, IT departments are enhancing their preparedness by bolstering their current plans with new technologies and business processes to protect, recover and restore essential data.

## Assessing Your Storage Needs for Business Continuity

It's not enough to simply have higher-capacity hard drives. Although storage is cheap on a cost-per-unit basis, ensuring that you have the right storage architecture and the most robust and powerful storage infrastructure requires a lot of planning, discipline and difficult decisions. And it requires money.

The right storage strategy for business continuity must take into account three key variables:

- **Backup:** What is the best way to back up data to ensure a company's ability to safely and quickly restore that data? Don't fall into the psychological trap many companies do by considering backup nothing more than

## A Primer on Data Deduplication

Any data storage administrator knows all too well the paradox of storage infrastructure costs: While the cost per storage hardware unit continues to plummet, the cost of backing up, archiving and managing all the data keeps skyrocketing. That, of course, is due to the fact that more rich data formats, such as video and audio, are proliferating in data stores, requiring tons more capacity and also creating a huge challenge when it comes time to access that data in real time. And that's made even more challenging considering the highly collaborative nature of how companies work, with extensive sharing of documents, files and digital assets.

That's where data deduplication comes in. Data deduplication identifies redundant files and identical sections of data and replaces those with references/links to a single instance of that data. So, instead of the same e-mail attachment being backed up and archived dozens, hundreds or even thousands of times, it's saved as a single master set of data, with links to the original.

Backup is probably the area where cost, capacity and time savings are the greatest, because full backups of an existing file system will encounter the same files and information multiple times. Data deduplication is also a popular approach in virtualized environments, since virtual servers often utilize replica copies of operating systems and other system files. Data deduplication benefits organizations looking to cut back on purchases of more storage devices, save time in managing the entire backup process and speed restore times as a critical part of disaster recovery and business continuity.

A few things to understand about when and where deduplication takes place:

**When:** Deduplication can take place either in-line or post-process. With in-line deduplication, data enters a storage device in real time. If the device identifies a data block that is already being stored on the system, it does not store that block again but just references the existing block. In post-process, new data is stored on a drive, where it's analyzed at a later date to identify possible duplications. Post-process deduplication enhances performance because there's no need to do calculations to spot redundant data in real time, but in-line duplication is more cost-effective in eliminating the source of redundancy immediately.

**Where:** Deduplication can occur at or near the source of data creation (source deduplication) or at or near the location where data is stored (target deduplication). Source deduplication allows for data on the data source (application, database, etc.) to be identified as a duplication, whereas target deduplication removes the duplicate in the secondary storage medium, such as a tape drive or disk-based repository.

<sup>1</sup>Business Continuity Market to Reach \$39 Billion by 2015, ABI Research, March 2010

insurance. A sound, well-thought-out backup approach is a critical first step in ensuring that business continuity becomes a reality.

- **Disaster Recovery:** How do you design and implement a high-availability solution based on the proper storage hardware and software for your company's business continuity needs? Keep in mind that, as important as it is to recover quickly, reliably and fully from a service interruption, if you wait until you have an outage to figure out what to do, you've just cost your company unnecessary time and money.
- **Archiving:** What is your approach to giving structure to the ocean of unstructured data residing on your devices, servers and networks so you can produce information, on demand, for such unforgiving applications as compliance? Remember that archiving is more than just one-dimensional storage; it's the ability to produce information as quickly and cost-effectively as possible.

There are a host of technology options to help you attack backup, disaster recovery and archiving within an overall business continuity framework. Storage hardware is more reliable, is cheaper on a per-unit basis and offers higher performance than ever. But software, even more than hardware, is the key to a rational, implementable and successful business continuity solution. And storage management is at the heart of ensuring that the right data is in the right place at the right time.

Another essential element to storage management that ensures timely availability of critical data is a concept called tiering. In essence, tiered storage (called hierarchical data management two decades ago) assigns priorities to different data, often changing in real time, and locates it on different storage devices and types of storage media. For instance, let's say there is data you need to access only sporadically, such as a company's annual contribution to employee profit-sharing. Most of the time, that data could be stored on inexpensive, low-performance storage media such as reel-to-reel tape. But when that data needs to be made available to close the year-end financials, automated procedures transfer that data to a high-performance, high-availability medium such as a dedicated hard drive on a storage area network.

Another vital element that your storage management software must provide as part of a business continuity framework is data deduplication (see related sidebar). Similar to the old concept of data compression, data deduplication eliminates redundant data that resides in multiple locations on your storage infrastructure. For instance, take that 10MB PowerPoint file that is attached to an e-mail sent to dozens of respon-

dents and then perhaps shared with dozens more throughout the organization. Under normal backup procedures without deduplication, that large file would be recopied multiple times, thus adding unnecessary time to the backup and archiving processes, as well as taking up huge volumes of space on backup media. With deduplication, only the original PowerPoint file is stored and each subsequent appearance of that file is simply referenced back to the original. In a business continuity solution, it's essential to incorporate data deduplication to save time, money and complexity.

Finally, remember that your business continuity plan must take into account the growing importance of virtualized storage, where data resides on "virtual" disks/tapes for a more cost-efficient architecture. In some ways, this is even more challenging than accounting for storage on physical hard drives. On one hand, there is no physical drive to fail because of a head crash, a bad drive sector or media contamination. But your business continuity storage architecture must properly map and document the location of information in virtual storage pools that may be found on different server platforms, in different operating environments or in different physical locations.

In fact, industry research and consulting firm Enterprise Strategy Group highlighted this challenge in recent research, indicating that while most IT organizations currently utilize different backup solutions for physical and virtual servers, they would prefer to move to a single-solution approach, primarily to reduce management complexity.<sup>2</sup> (See chart on the following page.)

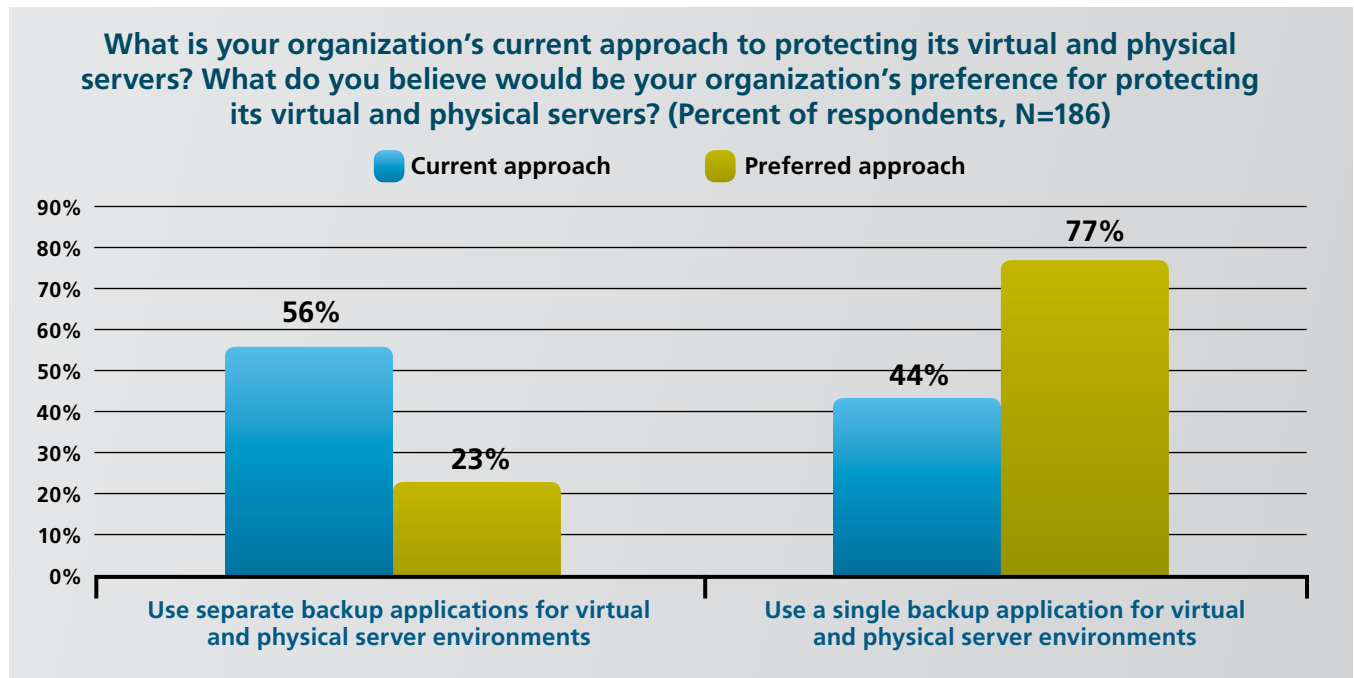
## Evaluating Your Business Continuity Storage Options

Because business continuity solutions must be custom-designed for each organization, one-size-fits-all approaches won't work. That means that different storage suppliers should be evaluated for different business continuity environments and customer requirements. Issues such as budgets, legacy infrastructure, staff expertise and "time to solution" all must be considered in evaluating solutions from different storage vendors.

When it comes to selecting a storage management platform for your business continuity needs, companies have several excellent options to consider. Four leading solutions stand out:

- CommVault Simpana
- EMC NetWorker
- IBM Tivoli Storage Manager
- Symantec NetBackup

<sup>2</sup>The Impact of Server Virtualization on Data Protection, Enterprise Strategy Group, September 2010



Source: ESG Research Report, *The Impact of Server Virtualization on Data Protection*, September 2010

Each of these products has a proven track record of success in large and small companies alike, and all come from reputable, well-resourced suppliers with well-established technology roadmaps to ensure a viable migration path over the future. All four solutions have a significant installed base that acts as a community you can draw on for tips and tricks to get the most out of your storage management systems. And all four suppliers can leverage a large network of value-added resellers with expertise in adapting and deploying the storage management platforms to business continuity applications for specific industries, such as financial services or healthcare.

As you evaluate each of these storage management solutions for your business continuity environment, remember to consider the following issues:

- Hardware and software platforms supported
- Virtualization support
- Data deduplication approaches
- Tiering capabilities
- Management tools
- Supplier viability

Let's examine each of the four in more detail.

### CommVault Simpana

CommVault recently released Simpana 9, the latest version of the company's storage management platform. The company says the release includes more than 500 new features and upgrades, primarily clustered into disk array integration,

virtualization, data reduction/deduplication, migration tools and licensing.

**Platforms:** Simpana 9 runs on a wide variety of operating systems, including Windows, NetWare, SUSE Linux, Red Hat Linux and numerous Unix implementations, including AIX, HP-UX, Solaris and SGI IRIX. It also supports a number of leading storage hardware platforms, including IBM, HP, Oracle/Sun, Dell, EMC, Network Appliance and Hitachi. Additional software platforms supported include DB2, Exchange, SQL, SAP and Oracle.

**Virtualization:** Simpana 9 offers application-aware support for VMware, the leading virtualization platform, as well as support for Hyper-V and Xen.

**Deduplication:** Support has been added for source-level deduplication, complementing its previous support for target-level deduplication. CommVault says Simpana 9 is able to perform deduplication across all storage tiers, calling this capability Universal Dedupe.

**Management Tools:** Simpana's "modern data management" feature set is described as a tightly integrated blend of snapshot, replication and persistent copies that are secure, deduplicated and accessible through a single unified management platform. Administration is eased by the use of a single operational view and one check box to enable deduplication. Simpana 9 also provides tools to help Symantec and IBM storage management solutions users migrate to the new CommVault offering.

**Supplier:** CommVault originally began in 1988 as part of AT&T's venerable research arm, Bell Labs. In 1996, it was spun off along with the Lucent business unit. CommVault has been a public company since 2006, and now generates annual revenue in excess of \$270 million. Based in Oceanport, N.J., CommVault reports it has more than 12,500 customers.

## EMC NetWorker

EMC positions its NetWorker storage management solution as "unified backup and recovery" to centralize, automate and accelerate data backup and recovery from data loss. According to EMC, NetWorker integrates and automates online protection of business-critical applications, such as databases, e-mail, content management and ERP.

**Platforms:** NetWorker supports Unix, Linux, NetWare, OpenVMS, Windows and Macintosh operating systems, among others. Additionally, it provides support for popular tools such as SAP R/3; Microsoft SQL Server, Exchange and SharePoint; IBM Informix, DB2 and Lotus Notes/Domino; Oracle; Sybase; and EMC's own Documentum.

**Virtualization:** Virtual environments supported include VMware, Hyper-V, Xen and Zones.

**Deduplication:** EMC's Avamar and Data Domain acquisitions have long been integrated into NetWorker's framework, giving it an extensive set of deduplication tools. Avamar-based client deduplication addresses backup challenges in remote offices and virtual environments, while Data Domain works with many backup software vendors to provide virtual tape with deduplication.

**Management Tools:** NetWorker uses a centralized, web-based graphical user interface to manage the program's operations, as well as installation and administration. The customizable interface supports built-in reporting to improve administration, and integral configuration wizards improve deployment.

**Supplier:** EMC has long been a leader in the storage management space, beginning initially in large data center environments and now extending into midrange and even relatively small environments through a series of product developments and acquisitions, such as Avamar in 2006, Data Domain in 2009 and VMware in 2003. The company expects to report 2010 revenues of nearly \$17 billion and employs about 40,000 people. The company is based in Hopkinton, Mass.

## IBM Tivoli Storage Manager

IBM Tivoli Storage Manager 6 (TSM 6) is the company's latest release of its popular storage management solution. TSM 6 is actually a family of products that provide a single point of

control and administration for storage management needs, such as data protection, recovery management and monitoring. TSM FastBack provides enhanced data protection and recovery across the enterprise, from the data center to remote-office servers and clients.

**Platforms:** In addition to operating systems such as Windows, Unix, Linux and numerous IBM proprietary systems, TSM 6 supports popular applications including DB2, Exchange, SQL, Domino, SAP and Oracle, among many others.

**Virtualization:** IBM says TSM 6 offers full-image backup of virtual machines by integrating with VMware Consolidated Backup to coordinate migration of VM data from the proxy server to tape drives, while using the vStorage API for Data Protection for file-level backup and recovery. Additionally, it supports Microsoft Hyper-V environments by performing full-image snapshots of virtual machines using the Microsoft Volume Shadow Copy Service.

**Deduplication:** Integral data deduplication includes source-level deduplication to reduce the amount of data sent from client systems to TSM 6, while target-side deduplication eliminates redundant data stored by the storage management system.

**Management Tools:** A web-based management platform supports such management and administration features as integrated reporting and monitoring, policy management, automated storage tiering and advanced tape management, among others.

**Supplier:** Tivoli Systems was formed in 1986 and operated as an independent company until 1996, when it was acquired by IBM. Today, Tivoli is part of IBM's Software Group, and is based primarily in Austin, Texas.

## Symantec NetBackup

NetBackup 7 is Symantec's unified platform for data protection, storage and recovery. The company has made a concerted effort to focus on enhanced deduplication capabilities and extended virtual machine support, as well as speeding disaster recovery for global organizations and upgrading its monitoring and reporting capabilities.

**Platforms:** NetBackup 7 supports a wide array of Unix and Linux operating system versions, including HP-UX, AIM and Solaris for Unix, and Red Hat, SUSE and Oracle Enterprise for Linux. Additionally, NetBackup supports Windows at both the client and server level, as well as Macintosh, OpenVMS and NetWare.

**Virtualization:** Among the virtualized platforms supported by NetBackup 7 are VMware, Zones, Hyper-V, VIO Server and

HP-UX Integrity VM. Symantec says its support for these and other popular hypervisors allows it to provide instant file recovery from block-level incremental backup for VMware vSphere environments and easy recovery of an individual file or folder from an image-level backup of a Hyper-V virtual machine.

**Deduplication:** Symantec’s “deduplication everywhere” approach is designed to speed backup and reduce overall capacity requirements by adding data deduplication into the backup client and at the media server. This is said to increase the speed and efficiency of backup at remote offices and in data center and virtual environments.

**Management Tools:** Both physical and virtual servers are managed through a single console, which also manages multiple backup and recovery products. The upgraded, centralized console supports integrated reporting, monitoring, alerts and management, helping users to analyze and predict risks and proactively take preventive measures.

**Supplier:** Formed in 1982, Symantec has long been known as a leader in the data protection and security industry. The company’s traditional strength in antivirus and other security products was augmented by the 2005 acquisition of Veritas, an innovator in the storage management field. Based in Cupertino, Calif., Symantec now employs more than 17,000 people and generated nearly \$6 billion in revenue for FY 2010.

## Choosing a Storage Management Platform

Clearly, all four of these storage management solutions offer robust, feature-rich and reliable approaches to ensuring that critical data is backed up, archived and reliably recovered in the event of a service interruption. All offer support for such critical functions as data deduplication, storage tiering, centralized management, virtualization and security, as well as the ability to run on all popular operating systems and work with industry-leading databases and business applications.

Additionally, all four suppliers are well-resourced, experienced companies with long histories of solid technology development and service, and each has an extensive network of hardware, software and channel partners that helps make your project a successful one.

So, how do you sort through it all and decide on the right storage management platform for your company’s business continuity plan? It’s not that easy, because you can’t necessarily look at the technical heritages of each supplier and assume those are their “sweet spots.” Yes, it’s true that each of the four came from somewhat different focal points over the years: IBM Tivoli Storage Manager, not surprisingly, grew up

in the big-iron world, while EMC made its mark in midrange systems from then-leading suppliers such as Digital Equipment and Data General. Symantec, even before its acquisition of Veritas, was deeply rooted in the Windows environment, and CommVault — owing to its initial days as part of AT&T Bell Labs — certainly was extremely knowledgeable about Unix.

Truly, all four companies have dramatically expanded their offerings over the years, both through acquisitions and internal product development. Most industry analysts would agree that all four have solid offerings across the board — a critical requirement, given the reality of the multi-platform, multivendor, heterogeneous environments in today’s IT world.

There are a few factors to consider as you evaluate your storage management options:

- **Financial:** Obviously, purchasing and/or licensing fees are top of mind here, but be sure to consider your total cost of ownership in deploying and running your storage management platform. Some lower-priced options may escalate in cost quickly when you add in service and support contracts, as well as the cost of training IT staff on a new platform.
- **Staff experience and expertise:** Your team may have built up years of knowledge in running earlier versions of a particular storage management platform, but that may be difficult to replicate when you move to a new vendor’s solution. That doesn’t mean you shouldn’t look for a better solution — just understand that these aren’t plug-and-play solutions. Your access to the right skill set, both inside and outside the company, is crucial.
- **Custom applications:** Over the year, it’s likely that you’ve either built or purchased customized applications. Some of these may not be optimized to work as smoothly with one storage management platform as with another, so take time to do your testing before making a commitment.
- **Support for remote sites:** Think about the bandwidth required to support far-flung offices outside of your physical headquarters, and be sure to understand each storage management solution’s ability to overcome bandwidth limitations.

## Next Steps: Choosing a Partner to Bring It All Together

Choosing the right storage architecture for business continuity projects requires extensive skill and experience. It is important to choose an independent, third-party partner to help you with the process of building a business continuity

strategy and plan. One of the key requirements of this independent partner should be vendor neutrality, because each business continuity storage solution brings unique qualities that may be more or less fitting for any given client. Of course, it's not enough to be simply neutral when it comes to recommending specific solutions for business continuity storage requirements. Your partner must have demonstrated expertise on parsing the various pros and cons of each supplier's solution, and applying them for individual clients as their needs dictate.

Of course, most projects succeed or fail in the deployment phase of the process, after the supplier options are evaluated and selections take place. The project must be scoped, designed, implemented, tested, taken "live" and then, most important, monitored and re-evaluated as business conditions change and new technology options become available.

In short, your selection of an independent consultant is a key step in your business continuity solution, especially when it comes to the storage components of the solution. That's why working with CDW makes a lot of sense. CDW has decades of experience in evaluating the best technology options for all-sized companies, from cutting-edge hardware, software and networking infrastructure to off-the-shelf systems and peripherals.

But CDW brings more than just in-depth technology evaluation and provisioning to the solution. CDW employs an array of specialists who are intimately familiar with architectures, applications, compliance requirements, service-level agreements (SLAs) and business processes, as well the bits and bytes of technology solutions. CDW's staff experts also understand that selecting a storage supplier is only one step in a series of interrelated tasks that an experienced team must take, including:

- Needs assessment: What is your organization's risk profile, what are the implications of business "discontinuity" and what does your current solution look like?
- System planning and design: Considering what is in place and your organization's current exposure to service interruptions, what would the ideal solution look like? How does that need to be adjusted to account for resource issues such as budget, staff expertise and time frame?
- Evaluate and recommend storage solutions for each unique situation.
- Oversee the solution's implementation, including development of a testing plan to periodically evaluate the organization's ability to respond to, and recover from, service interruptions.

Additionally, because CDW works with hundreds of value-added remarketers and channel partners of top technology providers, it can supplement its in-house staff with outside experts for such tasks as application development, systems integration, systems testing and around-the-clock monitoring.

CDW assigns your organization a dedicated project manager who will mobilize a skilled team to work hand-in-glove with your IT department and relevant business stakeholders. This collaborative effort creates a comprehensive business continuity solution incorporating backup, disaster recovery and archiving, and seamless integration within the scope of your existing business operations to prevent disruption and upheaval to your daily activities. CDW's team will also help you understand the financial issues necessary to gain approval from nontechnical decision-makers, from total cost of ownership and return on investment to SLAs, compliance, security and customer privacy.

Whether a customer already has audited their business requirements and has a good idea of what their business continuity needs may be or they need more arms and legs to design, install, test and fully deploy solutions, CDW acts as an independent expert, committed to providing the right blend of products and services for customers. Whether you have a large but overtaxed IT organization looking for specialized recommendations or you have a small team in desperate need of a business continuity solution — fast — CDW can craft the right approach for your problem.

## Guidelines for Successful Business Continuity Projects

No one goes into a technology-based project expecting to fail — especially in something with such far-reaching implications as business continuity. Still, mistakes happen, usually as a result of poor planning or failure to understand the mistakes others have already made. Here are a few tips to help ensure a successful business continuity deployment.

- **Get business stakeholders involved early.** It's amazing to think that some IT organizations still plan and deploy business continuity after only a cursory discussion with line-of-business personnel.
- **Compliance audits don't matter.** Well, at least not in the big picture of avoiding a catastrophic outage. Sure, your company will have to pass any number of compliance audits, depending on your industry, where you do business and other variables. But just passing an annual audit is meaningless when changing business conditions virtually guarantee you could be at risk of a system meltdown next week if you don't anticipate and adapt to those changes.
- **Think small and slow.** Unless you already have a full-fledged business continuity plan in place, don't try to "boil the ocean" with your first steps into a business continuity solution. Take one aspect of your business — be it an application, a business unit or a regional office — and be sure you can implement that segment first before trying to take the plan to an enterprise-wide level. And give your pilot project a good, thorough testing; it's better to find glitches now, when you can easily control, identify and contain them, rather than in a production environment.
- **Test, test, test.** Perhaps the single biggest mistake companies make with their business continuity plan is to put it on a shelf where it gathers dust until something happens. Your plan should be tested at regular intervals, under conditions that are as real-world as possible, without jeopardizing your daily business operations. Remember the carpenter's maxim: Measure twice, cut once.
- **Infrastructure matters.** Even if you outsource much of your IT organization to a service provider, chances are that some of the most vulnerable pieces of your IT framework still reside inside your four walls. Remember that malware has an uncanny ability of making its way into your company through thin clients, USB drives and smartphones. So make sure your in-house servers, storage and networking equipment are refreshed at regular intervals, and check to make sure you have the latest security patches in place for your applications.

## About CDW

CDW is a leading provider of technology solutions for business, government, healthcare and education. Ranked No. 41 on *Forbes'* list of America's Largest Private Companies, CDW features dedicated account managers who help customers choose the right technology products and services to meet their needs. The company's technology specialists offer expertise in designing customized solutions, while its technology engineers and solution architects can assist customers with the implementation and long-term management of those solutions. Areas of focus include notebooks, desktops, printers, servers and storage, unified communications, security, wireless, power and cooling, networking, software licensing and mobility solutions.

CDW was founded in 1984 and as of March 31, 2010, employed approximately 6,150 coworkers. In the 12 months trailing March 31, 2010, the company generated sales of \$7.6 billion. Intently focused on responding to customers' technology needs with a sense of urgency, CDW helps customers achieve their goals by providing the right technology products and services they need — when they need them.