

ENTERPRISE STORAGE:

DISASTER

Best-of-breed storage technology can support service interruptions, provide more effective management and help accommodate the unexpected.



DATA: Businesses depend on it. And it includes everything from marketing spreadsheets, contract templates and sales presentations to transaction records, payroll statements and training videos. Employees need corporate data readily available no matter the time of day or their location.

PROOFED

But data, like business itself, lives in an unpredictable world filled with risks. Natural disasters — floods, lightning strikes, hurricanes, earthquakes and wildfires — can wipe out a data center. A malicious attacker can slow servers to a crawl or take entire networks offline. Even minor network interruptions can significantly stymie productivity.

According to research from the McGladrey & Pullen accounting firm, every year one out of 500 data centers will experience a disaster so severe that 43 percent will be unable to recover. And another 29 percent will be forced to close within two years.

These facts and statistics demonstrate the importance of preparing a comprehensive business continuity (BC) and disaster recovery (DR) solution. This is a plan that identifies smart and powerful tools to help assure that essential business functions, like the availability of network data, continue operable during and after a disruptive incident — regardless of magnitude.

Incident Response

Being prepared for every contingency, without losing a second more uptime than absolutely necessary, remains a fairly complex challenge. In an ideal world, every piece of data a business produces would exist in multiple copies, across several locations and be instantly available.

But that ideal data world would be supremely expensive and wasteful. This is because it would likely cost way more in physical equipment, energy and management hours than the downtime it might prevent.

Maintaining business continuity is thus a question of balancing financial and human resources against the specific demands posed by particular data. Companies will often focus on what they can afford to do and what they are willing to implement based on the classic risk management approach of prioritizing against primary vulnerabilities.

“For instance, replication solves some problems, but replicating everything is way too expensive,” says Shane Jackson, EMC senior director of product marketing. “You have to find the line where it’s effective.” Not all data, as it happens, requires the same treatment.

High Cost of No Data

In developing a business continuity plan, “You have to start with RPO and RTO,” says Joe Disher, solutions marketing manager at Overland Storage. These two goals, the recovery point objective and recovery time objective, represent an analysis of the value of a piece of data and of the application that created it in the overall business picture.

In effect, RPO and RTO are answers to simple — if not always easy — questions: How far back can I afford to lose data? (That’s the recovery point.) And, how quickly do I need to be back online before the costs become unbearable? (That’s the recovery time.)

“IT managers have to ask themselves, ‘What am I looking at in terms of data recovery?’” says Peri Grover, Overland’s director of product marketing. “How mission critical is the data? How often is it needed? How fast is it needed? What are the implications if it can’t be brought back? And what is the cost of not being able to access the data?”

Fast and Furious

For most production environment data, speed of access is crucial in a disaster situation. A business will want full copies on fast storage that it can get to right away.

While a day or two without e-mail might not cripple a business, the loss of a few minutes or even seconds of incoming orders from the corporate website might cost a fortune. There is also the concern about what such an event can do to sour customer relationships.

While tape is still a key element in disaster recovery planning, today fast access means hard drives and, in some cases, solid-state drives. By eliminating spin-up and seek times, solid state drives offer almost instantaneous access to data.

Hard-drive storage comes in several forms, from direct-attached storage (DAS) connected to a single server or cluster to network-attached storage (NAS) shared among several devices. Growing in use, storage area networks (SANs) pool capacity available on several devices and allow allocation to specific applications and servers on an as-needed basis.

\$202
Average cost per
lost customer record
due to data loss
or theft in 2008.¹

DAS offers the simplest but least flexible option. Directly connected to one or more servers, DAS is not dependent on a network connection and is therefore unaffected in the event of network outages.

Using a redundant array of independent disks (RAID), data is either mirrored from one disk to another or striped across several disks, offering redundancy in case of drive failure or damage. However, because DAS storage capacity is locked to a particular server or server cluster, any unused capacity sits idle.

NAS and SAN systems leverage the network to maximize disk capacity, allowing storage to be assigned to any device on the network. NAS systems, such as the Overland Storage SnapServer line and HP StorageWorks X9000, can create expandable, centralized storage environments shared across the entire network.

SANs offer many of the benefits of NAS. However, they consolidate storage from across the network into a single virtual storage kitty rather than centralizing it in a single device. (In fact, SANs often include NAS.)

Though the kitty can be managed centrally, the storage itself might be distributed over several data centers and even multiple locations. By consolidating storage anywhere on the network

and making it possible to provision it to any other location on the network, SANs offer a high degree of flexibility and expandability. They also allow storage needs to be routed around any single point of failure.

Tape Storage

Despite falling hard drive costs, tape remains the most affordable storage medium, especially for long-term caching. Tape is also a more durable medium than a hard drive. It has a potential shelf life of 30 years or more — several times what anyone expects of the best hard drives.

Tape is fast, too — if you know what you are looking for. Data transfer speeds for tape are comparable to hard drives and in some cases much faster. The problem is that finding the particular data needed can be a slow process, which makes tape poorly suited to single-file retrieval.

For systemwide backup and restore, tape can still play an important role. It can also help in archiving important data for long-term storage.

Virtual tape libraries or VTLs are a data storage virtualization technology used typically for backup and recovery purposes. The technology, such as Overland's REO Series Virtual Tape Libraries, bridges the gap between existing backup systems that expect to write to tape and the faster access speed of hard drives.

"Where the recovery time objective is critical and you need to restore that data in seconds not hours, a VTL solution is great and can really augment a tape solution for archival storage," Overland's Disher says. "Some companies use it as a staging area where they can keep their backups for a week or so before transferring to tape."

Getting House in Order

The storage medium itself comprises only part of the overall business continuity picture. The total picture will also depend on how a company sorts, organizes and processes data for storage and retrieval. Developing this part of the equation can be daunting.

"If you look at enterprise-level storage, a company could have petabytes of data," says Gartner Research Director Gene Ruth, "It's hopeless for anyone to try to keep track of what's going on."

That makes it crucial to have solid business processes in place to determine the value of each type of data collected. With that information, a company can set policies for how each data type should be stored, for how long and at what redundancy level.

This makes tiered storage a primary consideration. With storage media ranging from super-fast flash drives and high-speed hard drives to less-speedy hard drives and tape, there are plenty of options to make sure mission-critical, high-RTO data can be quickly retrieved and low-value archival data stored affordably. Most disk arrays can support a mix of drive types and shift data from tier to tier based on policy settings.

For the most mission-critical applications, where even a few microseconds might be too long to wait, technologies such as mirroring, replication and continuous data protection (CDP) make up-to-the-second backups possible. Mirroring and replication are similar, in that both save every disk write operation to two or more drives simultaneously.

Tough Times:

How to Sell Business Continuity to Upper Management

1. Emphasize Vulnerability.

Remind upper management that if strong companies are vulnerable and need viable business continuity (BC) plans, a more financially challenged company is likely to be even more vulnerable.

2. Focus on a Few Likely Threats.

Don't go overboard presenting comprehensive, expensive BC and disaster recovery (DR) strategies. Focus on addressing the most likely causes of disruption: power outages, user error and virus attacks.

3. Start Small.

Perfect a backup strategy first, before you invest in more expensive technologies. That often means consolidating backup to disk storage rather than tape.

4. Present non-DR Business Benefits.

Perfecting BC/DR can have side benefits in removing performance bottlenecks and making data management better and more efficient. Other benefits include lower insurance costs and improved customer and employee loyalty.

Consider a CDW storage, power and networking specialist to assist with disaster-recovery needs.

Start with Backup

As you consolidate server and storage, you can and should first craft and perfect a single, viable, efficient backup strategy. This is before you start considering higher level DR strategies such as replication and continuous data protection.

"The best way to implement your disaster recovery strategy is from the bottom up," says John Sing, senior consultant, IT Strategy and Planning for the IBM Systems and Technology Group. "Make sure you're doing a really good job of fast, efficient backup and restore as a foundation.

"Only then should you take subsets of that data to apply other functions," he says. "These could include replication to improve recovery times as necessary." With efficient backup and restore, you may find that the amount of data and number of applications requiring advanced recovery technologies will decrease significantly.

Business continuity and disaster recovery requirements get more stringent every year. This is due to growing volumes of data, larger numbers of mission-critical applications and new regulations.

Fortunately, the technologies have also advanced and have become more affordable. By taking advantage of disk-based storage, continuous data protection and WAN optimization, you can create a very viable, cost-effective and efficient BC and DR strategy that will protect your data and get your business up and running faster. ♦

Best-of-Breed Processes

Continuous data protection takes replication a step farther, tracking disk changes over time so that a firm can access not only the latest version of the data but each previous change, offering protection in case of data corruption. CDP allows the IT team to roll back a system to its state just prior to corruption.

With so much data in play, automated processes become critical. "How do I link all of this different stuff, some of which needs to be up in one second, some in 24 hours, some next week?" asks Don Foster, senior product manager at CommVault.

CommVault's Simpana 8 allows processes such as replication, backup and restore, and tiering to be managed from a single console and simplifies their automation according to business rules. EMC's Fully-Automated Storage Tiering (FAST), available in its Celerra, CLARiiON and Symmetrix families of storage arrays, similarly automates the process of transferring data from one tier to the next as it becomes less critical according to business rules.

Data deduplication also helps to both minimize storage costs by reducing the capacity needed to store data and backups and to speed up backups by reducing the amount of data. Dedupe applications seek out redundant pieces of data across the network and replace them with a link, effectively storing only one copy of every duplicated file or piece of a file.

There is one more piece of the business continuity puzzle that needs to be considered: data that exists outside of the digital realm altogether — in other words, paper documents. At one time it may have been reasonable to worry about committing paper documents to digital storage.

These days, however, the ability to replicate, backup, index and shift data to offsite storage makes digital data a far more secure option than keeping an original copy of a document in a file drawer. Programs such as EMC Documentum and Extensis Portfolio simplify the digitization and management of scanned documents, allowing for fast retrieval and effective sharing.