Leveraging Virtualization for Disaster Recovery in Your Growing Business

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Now that SMBs have implemented virtual servers and storage in at least a portion of their data centers, it's time to leverage that investment beyond consolidation. Streamlined, reliable, cost-effective disaster recovery is a major benefit of virtualization and easy to achieve along with savings on server and storage units, floor space, power, cooling and management. Virtual architectures give IT managers the opportunity to save money, time and data with automated disaster recovery processes that can be easily tested and validated. Not only does the IT team sleep better at night, the organization knows that, as bad as a disaster would be, there's a way to quickly recover. Dell and VMware provide virtualization architectures that are tuned to SMBs' current and anticipated business and the tools needed to implement an effective disaster recovery plan.

What is Disaster Recovery?

In the simplest terms, disaster recovery is every IT manager's worst nightmare. The specter of a data center outage that lasts an hour or more looms large in a world where a slow network connection inspires a panicked call for assistance. While the most potentially debilitating disasters — including fires, floods, lightening strikes and earthquakes — aren't everyday occurrences, they certainly do happen. Smaller disasters, like power outages or server failures, might be less overwhelming, but they are more probable and certainly disruptive. Whatever the cause of a server or data center outage, anything that comes between employees and the applications, services and data they use for work has a negative impact on productivity and revenue generation.

The goal of disaster recovery is essentially the process of returning equipment, applications and services to full working status. Traditional disaster recovery processes rely on servers and storage units, typically housed off-site, that duplicate the configurations and resident applications and data of primary data center servers and storage units. Done correctly, data center mirroring is an effective way to restore work environments and data; employees simply log into servers and access data that reside in the secure location.

The problem is that full data center mirroring is prohibitively expensive. With tight IT budgets, SMBs find it challenging to double their infrastructure investment when, in the best-case scenario, half of it will remain idle. Mirroring is also time-consuming. In order to provide an effective backup, duplicate servers and storage arrays have to be kept in sync with primary servers and storage. Updates, upgrades, security and data have to be kept current, and hardware configurations have to be upgraded to support performance and reliability expectations. Finally, it's difficult to test and validate recovery procedures. Primary servers and storage arrays have to be taken off-line and employees switched over to duplicate systems. Testing either gets in the way of productivity or has to occur during off-hours, which strains already fully utilized IT resources.

SMBs are looking for ways to simplify and reduce the cost of disaster recovery while improving processes. Fortunately, investments in server and storage virtualization that are initially made to reduce data center power, cooling, space and management overhead through consolidation can be leveraged for disaster recovery improvements.

Leveraging Virtualization to Significantly Improve Disaster Recovery

Virtualization improves disaster recovery processes by saving money on backup servers and storage, eliminating the need for off-site equipment, significantly reducing data loss, increasing the speed of recovery, and vastly simplifying testing and validation.

Saving money on backup servers and storage

With virtual servers in place, there is no need for duplicate, mirrored systems. Instead, an image of the primary virtual machine exists on the logical partition of a second virtual machine. This saves a tremendous amount of money on duplicate equipment, along with power, cooling, space and management time. It's important to note that virtual machines are able to move between servers that are not identically configured. Files can be recovered to any server with capacity without having to make configuration changes.

Virtual storage also offers disaster recovery benefits beyond the savings associated with consolidation. Again, there is no need for duplicate arrays that mirror primary systems. Configurations in the data center and recovery site can vary, which allows IT to repurpose older storage devices. Virtual storage architectures allow physical storage devices with virtual storage configurations to reside off-site.

SMBs with multiple locations don't need a special off-site recovery location for servers and storage. They simply use the virtual architecture that resides at headquarters and remote locations to accommodate all virtual servers and storage, whether they are used as primary or recovery configurations.

Minimizing data loss

IT's biggest disaster-related fear is often data loss. While applications and service outages impact productivity, lost customer, personnel, legal, financial, product development and other data can take months to re-create. Ramifications might include lost sales, delayed product releases and legal liability.

Successful recovery requires short recovery point objectives (RPO). The shorter the RPO, the less data is lost. When the RPO is short, data has been recovered very close to the point in which the system failed. For example, if all data was backed up one minute prior to system failure, the company would lose one minute's worth of data.

The more frequent the backup process, the shorter the RPO. If an SMB that runs backups on Friday nights suffered a severe outage on Thursday, employees would lose a complete week of data — all the email, files and database entries they had created since the previous Friday night. More frequent data snapshots that back up smaller units of data every 15 minutes, for example, allow recovery to specific points in time, significantly reducing data loss.

Virtual platforms that allow frequent data snapshots reduce RPO and the overhead associated with prolonged backup processes. When they also include data deduplication (data is backed up only once; snapshots back up only new or changed data), the company enjoys greater savings on storage capacity.

Reducing time to recovery

The less time it takes to recover from an outage, the better. Recovery point objective (RTO) measures how long it will take the company to recover from an outage. An RTO of 10 minutes means that employees lacked access to messaging, applications and data for only minutes. That's long enough, however, and unfortunately, RTOs are often significantly longer.

Powering up and switching users over to a backup server can take hours. If IT staff has to travel off-site to locate and mount backup tapes or update a server configuration, RTO is even worse. In virtual architectures, virtual machines failover to working physical servers automatically, which reduces RTO to minutes, if that. In many cases, employees won't notice a change in service. If a virtual machine has to be physically moved to another physical server, IT simply copies all configuration and virtual disk files and imports them to the working server.

Simplifying testing and validation

Testing a validation of disaster recovery processes in a traditional environment is more time-consuming and expensive than in a virtual environment. Since recovery requires switching end users over to duplicate physical servers and storage, IT either has to involve the end-user community in testing or run tests during off-hours. Even when tests validate processes, it can be disheartening if recovery takes hours to accomplish.

Virtual machines allow testing to occur without disrupting production environments. IT is able to test and refine plans without involving end users or risking an inadvertent shutdown. Virtual platforms allow IT to test automatic failover, verify that backup snapshots are occurring on schedule and practice configuration copy without interrupting normal processing.

Creating a Virtual Environment that Delivers Improved Disaster Recovery

Virtual servers and storage arrays are, by their design and interaction, beneficial to disaster recovery. Automatic failover, short backup windows and the ability to migrate virtual machines at will give IT managers the tools needed to minimize both RTO and RPO. Of course, every business is different. Organizational structures, business plans, geographic distribution of employees and IT resources, and workloads are all variables that have to be factored into virtual server and storage deployment and disaster recovery processes.

The Dell/VMware partnership provides data center environments that fully leverage the disaster recovery benefits of virtualization to decrease RTO and RPO. A comprehensive portfolio of consulting and implementation services, virtualization and recovery solutions, servers and storage arrays give IT managers a single vendor relationship for sourcing current and on-going assistance.

Dell Services

IT managers and teams have access to information and services that help them plan successful disaster recovery plans. Workshops, classes and sample configuration documentation guide IT teams that are well-versed in virtualization or already manage fully virtual environments in recovery best practices and options.

Consulting and technical services provide specific guidance. Well-versed in VMware solution implementation, Dell consultants help assess current data center architecture and equipment to determine which servers and storage devices are appropriate for virtualization and disaster recovery. They outline the needed architecture and configuration improvements and work with IT manager to develop a disaster recovery plan.

New investments in software, servers and storage arrays are configured to specification and tested before shipping for out-of-the-box installation. Consultants offer on-site or phone-based deployment assistance, and support is available after deployment if needed.

VMware vCenter Site Recovery Manager

VMware develops market-leading virtualization and disaster recovery solutions. VMware Site Recovery Manager combines vSphere 4.1 ESX and ESXi hypervisor capabilities with backup and restoration services to create a fast and reliable disaster recovery process.

vSphere 4.1 ESX and ESXi hypervisors can achieve consolidation rates as high as 15:1 through partitioning; multiple applications and operating systems run from a single physical server. Automatic failover capabilities migrate virtual machines from a server failing to meet performance demands to another working server with capacity. Encapsulation stores the server operating system along with applications, data and configuration on a disk that can be copied to another physical server when needed. In the event of a server outage, IT does not have to rebuild the server image from scratch.

Backup services are delivered with VMware ESX Service Console and VMware Consolidated Backup. The system backs up all the files encapsulated in the virtual machine image to protect the complete image. Rather than copying complete images in one time-consuming backup process, VMware Consolidated Backup conducts incremental backups. Backup processes proceed while virtual machines are running, and end-user productivity is not impacted. The system works with other replication technologies to extend protection to the SMB's most critical systems.

vCenter Site Recovery Manager centralizes management functionality to facilitate the creation, updating, testing and execution of disaster recovery plans. The recovery process is fully automated to minimize opportunities for human error. Integration with Dell EqualLogic iSCSI SANS makes it easy to roll out comprehensive, automated recovery and testing.

Dell PowerEdge servers and EqualLogic storage arrays

Dell's PowerEdge servers and EqualLogic storage arrays are designed to support virtual data centers and comprehensive disaster recovery plans. Dell starts with equipment designs that reduce the risk of an outage. Both PowerEdge servers and EqualLogic storage arrays are built with standards-based components. EqualLogic storage arrays are fault-tolerant and equipped with redundant controllers and enterprise RAID protection that delivers 99.9999% availability.

PowerEdge servers also feature redundant, hot-swappable components to decrease downtime. There are no single points of failure. If a primary component does fail, the backup component automatically takes over. Technicians are able to replace faulty components with new units while servers are up and running. (EqualLogic storage array components are also hot-swappable.) End users remain productive, and there is no risk of losing data by shutting down servers and storage devices.

Dell equipment is also designed to support high levels of consolidation. VMware ESX and ESXi hypervisor consolidation rates of 15:1 can be accomplished, while performance remains high. SSD drives in both PowerEdge servers and EqualLogic storage arrays deliver high performance through much higher I/O per second than traditional drives.

PowerEdge servers come in a wide range of configurations. Tower, rack and blade configurations of varying capacities accommodate any business size, geographic distribution or processing load. Both PowerEdge servers and EqualLogic storage arrays scale easily to accommodate expansion.

Conclusion

With virtualization well under way inside SMBs, many IT managers are looking for ways to leverage their investments. Significantly improving disaster recovery plans by reducing the number and length of outages is an easy way to extend the savings already accomplished with server and storage consolidation. By eliminating the need for duplicate servers and storage units, streamlining backup processing to eliminate the impact on productivity, efficiently imaging virtual machines for easy copying and automatically migrating virtual machines from an underperforming server to one with capacity, virtualization significantly improves on traditional disaster recovery processes. Together, Dell and VMware provide the platform needed for all the benefits of virtualization and disaster recovery: consolidation, backup and recovery solutions and high-performance servers and storage arrays. Dell Services provides IT managers with best practices and configuration information and consulting services that include assessment, disaster recovery plan design and implementation.