



NetApp™
Go further, faster



Infrastructure Solution

Business Continuity for Virtualized Microsoft Environments

KEY BENEFITS

Maintain business uptime

Maximize application availability and eliminate data loss with clustering and replication.

Reduce TCO

Implement cost-effective disaster recovery and minimize the financial impact of downtime for your virtual infrastructure.

Simplify manageability

Leverage tight technology integration and automation to streamline business continuity operations.

OPTIMIZING EFFICIENCY WITH VIRTUALIZATION

Server virtualization is one of the hottest topics in the enterprise IT community today. Consolidating multiple physical servers and associated applications onto a single physical server reduces hardware sprawl and management complexity while greatly improving resource utilization.

THE IMPORTANCE OF HA AND DR FOR VIRTUAL ENVIRONMENTS

While server virtualization is a major step toward improving hardware and operational efficiency, you also need to consider how to best protect your critical data. Why is business continuity so critical for virtual environments?

System and data availability

As you consolidate virtual machines (VMs) in your physical servers you also increase the number of applications that can be rendered inaccessible by a disk failure, data corruption, data loss, or slow RAID rebuilds. The moderate expenses normally associated with downtime for a single SQL Server® database, for example, could quickly degrade into a financial disaster if several

critical applications are affected by a single system failure or human error.

Disaster recovery

While the business impact of a single component failure can be significant, the effects of a prolonged site outage caused by unexpected disasters can be much greater, and even threaten the viability of your business.

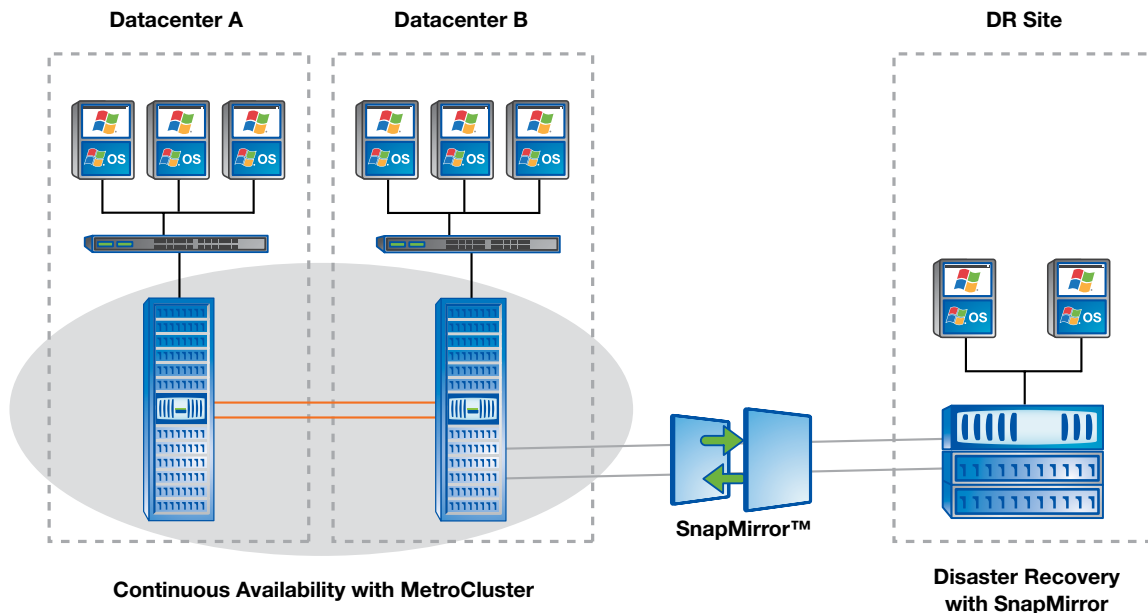
AN END-TO-END VIRTUALIZATION SOLUTION FROM NETAPP AND MICROSOFT

Virtualization not only improves infrastructure efficiencies, it actually plays a critical role in centralizing and simplifying high availability and disaster recovery. A virtualization solution from NetApp and Microsoft enables you to maintain application and data access throughout disruptive events. Our advanced server and storage virtualization technologies help reduce your hardware and administrative costs. Our integrated business continuity technologies help you cost-effectively automate and streamline backups, failover, replication, and rapid movement of servers, storage, and applications, to keep your business up and running under all conditions.

Microsoft®
GOLD CERTIFIED
Partner

2009 ADVANCED INFRASTRUCTURE SOLUTIONS
Storage Solutions
PARTNER OF THE YEAR
WINNER

NetApp/Microsoft HA and DR Solution for Virtualized Microsoft Environment



OVERVIEW OF MICROSOFT VIRTUALIZATION TECHNOLOGIES

To simplify your virtual infrastructure, Windows® Server 2008 provides an efficient solution that combines a SAN-aware operating system with virtualization and other high-availability capabilities to help you meet your uptime requirements for critical Microsoft® applications.

- Hyper-V™ consolidates multiple VMs onto a single physical system, so you can reduce hardware redundancy and management complexity and make the best use of your server investments and administrative staff. Hyper-V also lets you efficiently run various operating systems—Windows®, Linux®, and others—in parallel, on a single server, and provides a highly granular method of assigning virtualized resources for each VM. To optimize scalability and availability, Hyper-V virtual machines can also run Windows Network Load Balancing Service to balance network traffic across VMs on different servers, detect host failures, and automatically redistribute traffic to operational hosts.
- As workloads change over time, you need to move VMs to the best physical server for performance, scaling, or optimal consolidation. Live migration maintains application uptime by enabling you to

move a running virtual machine from one Hyper-V physical host to another without taking it down. You can also increase user productivity by keeping VMs online during routine functions like maintenance and backups.

- Failover clustering is another key Windows Server high-availability component that supports virtual and physical environments. Your VMs and applications can automatically fail over to another node in the local cluster in the event of server hardware, operating system, or network failures or a planned upgrade, minimizing application downtime.

Microsoft System Center delivers simplified, centralized management for your entire physical and virtualized Microsoft environment, including applications within VMs. This suite of enterprise-class data center products helps you avoid administrative overload and reduce operational expenses.

- Virtual Machine Manager enables you to configure, deploy, and manage VMs from a single console. Its Failover Cluster Management Console also lets you add an entire Hyper-V host cluster in a single step and automatically detect node additions and removals. With Operations Manager you can monitor and manage Microsoft applications, server, and storage

components, and automatically detect and initiate failovers.

OVERVIEW OF NETAPP BUSINESS CONTINUITY TECHNOLOGIES

The combination of NetApp® and Windows Server Hyper-V technologies boosts server and storage utilization, can substantially reduce your storage, power, cooling, and floor space needs.

NetApp's unified storage architecture and highly resilient Data ONTAP® operating system are the foundation for many advanced technologies that enhance both efficiency and availability. You can dynamically provision and resize storage, deduplicate redundant data, and create instant space-saving Snapshot™ copies of VM data for rapid backups without any performance penalty. With RAID-DP® you can also gain RAID 10 data protection using almost 50% less disk capacity. In fact, we guarantee that you'll save at least 50% on your virtualization storage requirements with these capabilities.¹

Although Microsoft Hyper-V technologies provide simplified, reliable high availability at the host and application layers, NetApp adds fast backups and restores, continuous data availability, and rapid disaster recovery at the storage layer.

Our integrated business continuity technologies help you cost-effectively automate and streamline backups, failover, replication, and rapid movement of servers, storage, and applications, to keep your business up and running under all conditions.

- In today's 24x7 environments you can't afford to spend hours backing up or restoring your virtualized data via tape. NetApp SnapManager® solutions are tightly integrated with Microsoft applications and the Hyper-V architecture. You can schedule and automate instant, Snapshot-based backups for Exchange, SQL Server, or SharePoint® Server data at the VM level—and restore data from any Snapshot copy in minutes.
- NetApp MetroCluster is the industry's only solution that combines array-based clustering and synchronous data mirroring to provide zero downtime and zero data loss at half the cost and complexity of competitive solutions. MetroCluster protects Hyper-V VM data against downtime events within your data center, including human errors and power, cooling, and network failures that occur beyond the array. To help protect your data from site disasters, MetroCluster enables you to extend failover capability from within a data center to another site within 100 kilometers. MetroCluster maintains two consistent mirror images of the data across two arrays, automatically reflecting any updates on both sides to simplify change management. This combination of automated, transparent failover and data mirroring means that you can

recover Hyper-V VM data from a disaster in minutes.

- How do you recover data from a regional outage or disaster that extends beyond a metropolitan area? NetApp SnapMirror® enables you to replicate your Hyper-V VM data across unlimited distances over IP or Fibre Channel so you get the full continuum of recovery point objectives—from zero time to hours—and disaster protection over wide areas. SnapMirror enables data recovery for your business-critical Microsoft applications within minutes versus hours or days, with tape-based DR solutions. SnapMirror also optimizes network bandwidth and minimizes storage requirements at your DR site(s) by eliminating redundant data, replicating only changes to data blocks, and using native network compression technology.

BENEFITS OF COMBINING NETAPP AND MICROSOFT TECHNOLOGIES

By implementing an end-to-end business continuity solution from NetApp and Microsoft, you can maximize uptime and meet aggressive SLAs for your Microsoft virtualized infrastructure, including critical Exchange, SQL Server, and SharePoint application environments.

- Increase the availability of server and storage infrastructures: The combination

of Hyper-V failover, centralized cluster management via System Center, and NetApp MetroCluster creates a comprehensive application and data availability solution. You can eliminate application downtime and data loss in the event of system or site failures with automatic failover of Hyper-V and NetApp environments to another site within the region. This solution also helps eliminate planned downtime through nondisruptive hardware and software upgrades.

- Accelerate recovery from unplanned outages: SnapMirror delivers reliable disaster recovery for Hyper-V infrastructures within minutes. SnapMirror safely replicates data synchronously or asynchronously between regional sites, and works with Hyper-V environments exactly as it does with physical servers. SnapMirror also integrates with SnapManager, leveraging application-aware Snapshot copies for replication, so application consistency is maintained.
- Flexibly expand disaster recovery capabilities: You can deploy SnapMirror in various configurations, including one-to-one, one-to-many, many-to-one, and round-robin scenarios. SnapMirror also optimizes resources by supporting different NetApp storage systems on your primary and secondary sites. To further maximize the use of DR assets, you can

use replicated data for multiple purposes. NetApp FlexClone® lets you instantly clone VMs at remote sites, converting replicated read-only data volumes into writable copies that can be used for DR testing, business intelligence, and development and test environments, using virtually no additional disk space.

- Provide consistent policy execution with automated data management: One of the biggest advantages of the joint NetApp and Microsoft virtualization solution involves policy-based management and the ability to free up administrative

resources for other activities. You can set up policies to automate backups, failover, replication, and recovery; reduce errors; and provide consistent execution across all components of the solution, including Hyper-V, MetroCluster, SnapMirror, Snapshot, and SnapManager.

CUSTOMER BLUEPRINT

Learn how to implement an efficient, affordable, end-to-end virtualization solution that enables local and remote site recovery for virtualized Exchange, SQL Server, and SharePoint environments. The

NetApp and Microsoft customer blueprint, “Improving Efficiency Using Microsoft Hyper-V and NetApp Storage,” provides a reference architecture with specific logical and physical configuration details. It describes how to deploy Windows Server 2008 Hyper-V, Microsoft System Center, and NetApp storage technologies for an optimized business continuity solution in a real-world scenario.



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NetApp creates innovative storage and data management solutions that accelerate business breakthroughs and deliver outstanding cost efficiency. Discover our passion for helping companies around the world go further, faster at netapp.com.

¹ NetApp Virtualization Guarantee Program

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