IBM

IBM System Storage™ Solutions for Microsoft Hyper-V

Highlights

■ *Achieve a highly available and disaster-tolerant computing environment*

■ *Complement improved efficiency and reduced total cost of ownership through increased hardware utilization in your server infrastructure with reliable replication of data between sites via the IBM DS5000 and Remote Volume Mirroring*

■ *Enjoy a robust, easy-to-manage disaster recovery environment featuring the flexibility and efficiency of the IBM BladeCenter, System x 3850 M2, System x 3950 M2, and the DS5000 modular storage system*

■ *Enjoy IBM best-of-breed solutions based on close collaboration with the Microsoft product teams*

Is your organization looking for ways to reduce the cost of managing and operating your Microsoft information infrastructure? Would you like to increase productivity by maximizing the effectiveness of your server infrastructure and optimizing your storage performance? IBM System Storage solutions for Microsoft Hyper-V can help you achieve those goals.

Companies of all sizes are interested in energy and space efficiency, more centralized management, and flexible disaster recovery options to reduce their total cost of ownership. Today's virtualization solutions help customers reduce datacenter complexity and management costs, providing dynamic and flexible configurations across multiple resources.

IBM Storage Solutions for Microsoft Hyper-V

A virtualized server environment helps to improve the efficiency of your computing resources by utilizing your hardware resources more efficiently and fully. With Microsoft Hyper-V and Windows Server 2008, organizations are equipped to streamline their IT infrastructure and take advantage of the more efficient storage and server solutions IBM has to offer. Microsoft Hyper-V allows you to create and manage a virtualized server computing environment and can help your organization improve efficiency and reduce costs. Completing the solution, IBM System Storage provides the high performing, scalable, reliable, available, and flexible midrange storage systems needed to support the Microsoft Hyper-V information infrastructure.

High availability and disaster recovery are two key areas where virtualization can offer significant flexibility and cost savings. For example, Hyper-V virtualization can help you:

● Reduce the cost of operating and maintaining physical servers by increasing hardware utilization – enabling you to reduce the hardware needed to run server workloads.

● Increase development and test efficiency by reducing the amount of time it takes to set up hardware and software and reproduce test environments.

● Improve server availability without using as many physical computers.

● Improve scalability so you can increase or reduce server workload in response to changes in workload demand.

Proven IBM interoperability with Microsoft Hyper-V: Implementing Hyper-V for high availability and disaster recovery scenarios

IBM has worked closely with Microsoft to ensure our products are optimized for Hyper-V deployments. Using the IBM System Storage DS5000, System x3850 M2, and BladeCenter servers with Hyper-V, the following reference architecture outlines one possible solution for intra-site high availability and inter-site disaster recovery scenarios.

The configuration includes simulation of two geographically dispersed sites, with local site HA provided by 2 MSCS failover clustered HS21XM Blade servers hosting multiple Hyper-V virtual machines. The DR simulation consists of Remote Volume Mirror LUN replication between the two sites, with the capability of bringing the Hyper-V virtual machines online at the second site if the main datacenter goes down or is otherwise unavailable. Remote Volume Mirroring is a premium feature of the IBM System Storage DS5000. Data replication and control is handled by the array controllers over replication links with little or no impact on host applications. Advanced features such as ordered-writes and consistency group support help ensure that complex application LUN layouts and database integrity are preserved.

Hyper-V virtual servers run as cluster resources, and automatically fail over if one host node is unavailable. These virtual machines can also be quickly migrated between the cluster nodes, pausing
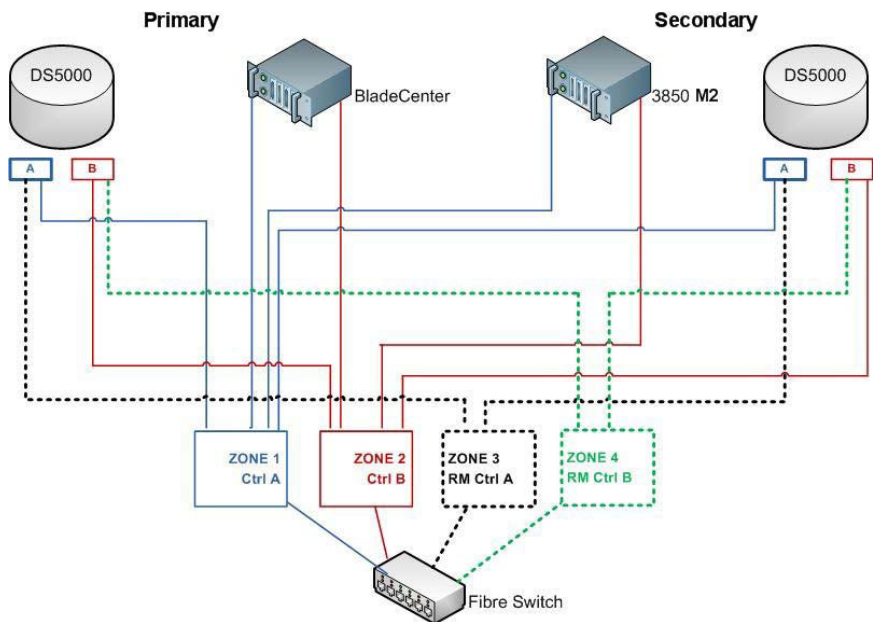

Figure 1: Hyper-V Reference Architecture

running applications and resuming automatically once online. In a DR event, replicated LUNS and guests are manually activated and brought online.

In the event of a local site failure, if the entire BladeCenter or DS5000 goes offline within the primary site, Hyper-V guest machines are restarted on the System x3850 M2 at the secondary site. Replicated data will be in a crash-consistent state, and application recovery methods (i.e. log replay) are activated. In a manual fail over (i.e. for maintenance), this would not need to occur. Once the LUN's are enabled read/write & mapped to the relocated Hyper-V guests, the applications are restarted and service resumes.

In the event of an outage at the secondary site, the reciprocal process to the primary site failure would occur, and Hyper-V guests would be manually restarted at the primary site.

Since Hyper-V uses the familiar MMC 3.0 framework, Windows administrators can manage the virtualized, clustered environment in a familiar environment. Furthermore, the DS5000 Storage Manager GUI is easy to configure & manage even in complex HA/DR scenarios such as RVM.

Components of the tested solution

Microsoft Hyper-V

Microsoft's Hyper-V, included with Windows Server 2008, provides software infrastructure and management tools that you can use to create and manage a virtualized server computing environment for consolidated and scalable datacenters.

Key features of Hyper-V include:
- 64-bit native hypervisor-based virtualization
- Ability to run 32-bit and 64-bit virtual machines concurrently
- Large virtual machine memory support and Virtual LAN support

- Virtual machine snapshots capture the state of a running virtual machine so you can revert the virtual machine to a previous state, quickly and easily
- Runs on all roles including Server Core, of Windows Server 2008
- MSCS failover cluster support
- Microsoft Management Console (MMC) 3.0 interface

IBM System Storage DS5000

As IBM's most powerful midrange storage system, the new IBM System Storage DS5000 is well-suited for a virtualized environment that can keep pace with your business growth. Organizations can buy only the capacity needed initially, and can then dynamically upgrade and reconfigure additional capacity and features later to meet changing business requirements, all without any system downtime.

The DS5000 helps set new standards for performance, scalability, reliability, availability, and flexibility intermixing both FC and SATA disks for midrange storage systems. The DS5000 delivers class-leading performance and is equally adept at supporting transactional-applications, such as databases and OLTP, throughput-intensive applications, such as HPC and rich media, and concurrent workloads, well-suited for consolidation and virtualization.

With its relentless performance and architected to provide the highest reliability and availability, the DS5000 storage system is comfortable supporting the most demanding service level agreements (SLAs). And when requirements change, the DS5000 can easily be reconfigured "on-the-fly" to add or replace host interfaces, increase performance, grow capacity, or add cache – ensuring it keeps pace with your growing company.

The IBM DS5000 provides proven performance in industry-standard SPC-1 (OLTP) and SPC-2 (OLAP) benchmarks. Flexibility in the future will include 8Gbps FC and 10Gbps iSCSI interfaces that will support 448 drives and full disk encryption.

IBM System x and IBM BladeCenter

The IBM System x3850 M2 and x3950 M2 servers provide an uncomplicated, cost-effective and highly flexible modular solution. With the ability to scale to 16 sockets, the servers maintain balanced performance between processors, memory and I/O. The IBM System x3850 M2 and x3950 M2 servers can easily accommodate business expansion and ever-increasing workloads.

The IBM BladeCenter H delivers high performance and reliability, and increased flexibility to even the most demanding IT environments.
- In 9U rack space, the BladeCenter H chassis can contain up to 14 IBM Power, Intel, or AMD blade servers, 10 switch modules, and four power supplies to provide the necessary I/O network switching, power, cooling, and control panel information to support the individual servers.
- The chassis supports up to four traditional fabrics using networking switches, storage switches, or pass-through devices. The chassis also supports up to four high-speed fabrics for support of protocols like 4X InfiniBand or 10 Gigabit Ethernet.

IBM SAN Volume Controller for storage virtualization

In addition to the reference architecture above, IBM offers industry-leading storage virtualization to help provide a complete, end-to-end virtualized information infrastructure, complementing Microsoft's Hyper-V server virtualization. With IBM's high-performing SAN Volume controller (SVC), customers can virtualize their Microsoft storage environment.

SVC combines the capacity of multiple disk storage controllers into a single storage resource. These disk controllers can be from many different vendor companies. From a single resource, operators can apply copy services across all the disk controllers in this resource, as well as perform point-in-time copies (FlashCopy) or replicate data using Metro Mirror or Global Mirror. SVC also has the ability to perform many tasks within the storage infrastructure using the data stored on the disk controllers – without disrupting the Microsoft platform.

IBM System Storage and Hyper-V: Putting it all together

Microsoft's Hyper-V ushers in a new era of affordable application virtualization to companies of all sizes, offering new opportunities for increased resource utilization, ease of management, and improved ROI. IBM has worked closely with Microsoft to help ensure our products are optimized for Hyper-V deployments. Together with the new System Storage DS5000, or by adding SVC to virtualize a multi-vendor storage environment, the ability for companies of all sizes to efficiently implement a highly available and disaster-tolerant computing environment continues to improve.

For more information

For more information, please contact your IBM representative or visit:

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