

Windows Server 2008 Hyper-V

Microsoft Corporation | Product Overview



Windows Server[®] 2008

Hyper-V[™]

Windows Server 2008 Hyper-V Product Overview

Microsoft Corporation

Published: October 2008

Hyper-V Product Overview

The information contained in this document represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

This White Paper is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS DOCUMENT.

Complying with all applicable copyright laws is the responsibility of the user. Without limiting the rights under copyright, no part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of Microsoft Corporation.

Microsoft may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Microsoft, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

Unless otherwise noted, the example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted herein are fictitious, and no association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

© 2007 Microsoft Corporation. All rights reserved.

Microsoft, Active Directory, ActiveX, , Visual Basic, Windows, the Windows logo, Windows NT, Windows, Windows Server, and Windows Server System are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

All other trademarks are property of their respective owners.

Table of Contents

Introduction.....	5
Hyper-V Overview	6
Flexible Virtualization Capabilities	6
Robust Virtualization Platform.....	7
Enhanced Security	7
Hyper-V as Part of Microsoft’s Datacenter-to-desktop Virtualization Strategy	8
Server Virtualization.....	8
Presentation Virtualization	9
Desktop Virtualization.....	9
Application Virtualization.....	9
Comprehensive Management in a Familiar Environment	9
Addressing Key Business Needs	10
Server Consolidation	10
Cost Savings.....	10
Optimizing Infrastructure.....	11
Flexibility	11
Business Continuity and Disaster Recovery	11
Testing and Development	12
Extensive Guest Operating System Support.....	13
Virtual Machine Libraries and Self-service Portals.....	13
Checkpoints in Testing and Development.....	13
Moving Toward the Dynamic Datacenter	13
Automated Virtual Machine Reconfiguration	14
Flexible Resource Control.....	14
Quick Migration.....	15
Utilization Counters.....	15
Branch Office Management	15
Server Consolidation in the Branch Office	15
Business Continuity/Disaster Recovery in the Branch Office.....	15

Hyper-V Product Overview

Development and Testing for the Branch Office.....	16
Improving Agility in the Branch Office	16
Summary	16

Introduction

Today's datacenter is a complex ecosystem with different kinds of servers, operating systems, and applications interacting with a wide variety of desktop computers and mobile client computers. For IT departments, managing and supporting this assortment of mission-critical technologies is a challenge. Deploying server virtualization technology—moving disparate servers to virtual machines (Virtual machines) in a centrally managed environment—is an increasingly popular option for facing this challenge.

Virtualization reduces IT costs, increases hardware utilization, optimizes business and network infrastructure, and improves server availability.

Windows Server® 2008 includes Hyper-V (formerly codenamed viridian), a powerful virtualization technology that enables businesses to take advantage of the benefits of virtualization without having to buy third-party software.

The most widely leveraged benefit of virtualization technology is server consolidation, enabling one server to take on the workloads of multiple servers. For example, by consolidating a branch office's print server, FAX server, Exchange server, and Web server on a single Windows Server, businesses reduce the costs of hardware, maintenance, and staffing.

Hyper-V enables consolidation of a broad range of services ranging from resource-intensive services like Microsoft SQL Server™ to third-party applications that may run on previous versions of Windows® or Linux. In addition to reducing the cost of buying or leasing server hardware, virtualization reduces costs associated with managing server heat, electricity usage, physical space, and maintenance.

Hyper-V enables more than server consolidation, however. It also improves network reliability, scalability, security, and flexibility. Servers that slow down due to peak usage at the start of the workday, for example, can offload some of their workloads to other servers, which increase their capabilities, or move to more powerful servers, improving network availability. Virtual machines are able to take advantage of security and capacity advancements found in the current generation of server hardware. Server software designed for other operating systems like Linux can run on the same hardware as Windows solutions, and take advantage of centralized management using industry-standard tools, making Hyper-V a flexible alternative to dedicating separate servers to a single type of architecture or operating system with disparate management tools.

This white paper introduces Hyper-V as a key component of the Microsoft datacenter-to-desktop virtualization strategy. It shows how new and enhanced features in Hyper-V help relieve enterprise customer pain points in common scenarios: server consolidation, business continuity and disaster recovery management, testing and development, and the dynamic data center. It also highlights how these benefits scale to meet the unique needs of small businesses and branch offices.

Hyper-V Overview

Microsoft has been providing powerful virtualization tools for years. Microsoft Virtual Server 2005, the current server offering, remains a leader in compatibility and industry support. As virtualization goes mainstream — majority of enterprise organizations are using or evaluating virtualization — and businesses are benefiting from total cost of ownership reduction for server infrastructure and the other advantages for server consolidation and increased agility. IT administrators and planners are now looking to extend the use and virtualize applications and processes that are more demanding. They want more powerful and flexible virtualization solutions that are better integrated with their management tools, and that can take advantage of the next generation of 64-bit server hardware.

In light of these developments, Microsoft developed Hyper-V, a next-generation, 64-bit virtualization technology that reduces costs, increases hardware utilization, optimizes network and business infrastructure, and improves server availability.

Hyper-V is a key feature of Windows Server 2008, integrating with familiar, Windows-based server management tools. Businesses don't have to purchase additional software to take advantage of powerful virtualization features like live backup and quick migration. For customers who want a complete server management solution that works with virtual machines and physical servers, Microsoft's System Center product line now includes advanced virtual machine management and monitoring capabilities. Hyper-V's open architecture enables internal development teams and third-party software developers to build enhancements to the technology and tools.

With Hyper-V, Microsoft provides a platform with flexible and robust virtualization capabilities.

Flexible Virtualization Capabilities

Hyper-V is part of the Microsoft datacenter-to-desktop virtualization strategy, delivering the benefits of virtualization at all levels of a company's IT infrastructure. Its server virtualization features can benefit not only enterprise-level servers with hundreds or thousands of clients, but also servers in small branch offices, and everything in between.

Hyper-V enables virtual machines to take advantage of very large amounts of memory, powerful multi-core processors, dynamic storage solutions, and the latest generation of fast networking functionality. That means even very resource-intensive, mission-critical server applications become viable candidates for consolidation and virtualization rather than requiring their own dedicated servers.

At the other end of the spectrum, businesses can consolidate small branch office servers to benefit from Hyper-V and System Center features, such as centralized management and monitoring, automated backup, and industry-standard management tools. This enables branch locations to operate without local IT staffs, with the branch's servers being completely managed and backed up by the central office. In the event of a severe problem at the branch, virtual machine backups can be very quickly redeployed to new hardware. The central office can use local contractors for any hands-on work, secure in the

knowledge that they'll be familiar with the standard Windows interface on the branch's network management tools.

System Center is able to increase system flexibility by converting existing physical servers to VM-based servers. For example, System Center Virtual Machine Manager's Physical-to-virtual (P2V) conversion enables an administrator to standardize the server hardware platform and use virtualization to bring even some line of business applications into a virtual machine format, all from the console and with minimal downtime. With System Center monitoring tools this process can be automated based on administrator-determined metrics.

Robust Virtualization Platform

Virtual machines can leverage powerful clustering, backup, and security features in Windows Server 2008 to keep the network running as smoothly as possible through demand spikes, increased workload, or server problems. Hyper-V uses Windows Server 2008's Volume Shadow Copy Services to enable fast and reliable disaster recovery, getting businesses back to work with the minimum of interruption, even after natural disasters or hardware failures.

Host clustering uses multiple physical servers to minimize the potential impact of one server failing. Guest clustering uses multiple virtual machines to provide the same type of protection for Virtual machines as well as load balancing within a single virtualization host server. Hyper-V supports host and guest clustering, enabling network architects to design and implement more robust and flexible network configurations.

Hyper-V's quick migration feature enables Virtual machines to be moved to other servers, automatically or manually, with minimal downtime.

Customers can leverage their current management investments in products like System Center Operations Manager (SCOM) to preempt problems by identifying important but non-urgent issues with servers—a system nearing its maximum capacity, for example. SCOM can alert administrators, and/or automatically move that server to virtual machine on another physical server based on thresholds.

Enhanced Security

Security is a core challenge in every server solution, whether physical or virtualized. Virtualization hosts are, in many ways, at least as exposed as their standalone counterparts. However, the exposure of the host systems, if not managed, could also lead to weakening of the security of the virtual machines. Hyper-V enhances virtual machine and host security in several ways.

Hyper-V enables virtual machines to take advantage of hardware-level security features available on servers built with the latest generation of processors. For example, "execute disable bit" is a hardware-level feature that senses the most common type of virus attacks and prevents many viruses from being able to take over a system, overload the system, and spread to other machines.

Shared servers with multiple administrators can also present security risks. Hyper-V provides strong role-based security through Active Directory and Group Policy integration, preventing exposure of secure virtual machines through shared servers. For example, a system can be set up so that the administrator for the payroll application is unable to reconfigure the mail server.

By integrating with industry-standard network security tools, Hyper-V enables administrators to provide the same kinds of protections for the host systems and virtual machines that they provide for physical servers. Virtual machines can utilize the Windows Firewall and Network Access Protection Policies (quarantine) just like physical servers.

Hyper-V's streamlined architecture itself represents a security benefit. By minimizing the code base for the hypervisor component of the virtualization technology in combination with the Server Core installation option of Windows Server 2008, Hyper-V is able to present a much smaller "attack surface" for viruses and malicious attacks.

Hyper-V as Part of Microsoft's Datacenter-to-desktop Virtualization Strategy

The Microsoft datacenter-to-desktop virtualization strategy enables businesses to leverage virtualization benefits throughout the organization. Hyper-V is an integral part of the overall Microsoft virtualization strategy. This section will briefly describe the different components of Microsoft's strategy and establishes the context of how Hyper-V along with other technologies helps you solve your organizations pain points. Microsoft's virtualization strategy includes five key components:

- Server virtualization, enabling multiple servers to run on the same physical server
- Presentation virtualization, enabling remote users to access their office desktops or server-based applications
- Desktop virtualization, enabling desktop operating systems to be consolidated into the datacenter
- Application virtualization, helping to prevent conflicts between applications on the same PC
- Comprehensive management, tying virtual components into the same management tools used to monitor and control physical components

Server Virtualization

Microsoft has two server virtualization offerings: Hyper-V in Windows Server 2008, and Virtual Server 2005 R2. Hyper-V extends virtualization capability to manage 32-bit Virtual machines alongside 64-bit Virtual machines, enable Virtual machines to access larger amounts of memory, and enable Virtual machines to leverage multiple processors. Virtualization is a key feature of the operating system and helps customers get complete isolation of the different virtual machines and still benefit from server consolidation.

Presentation Virtualization

Presentation virtualization is a technology that enables applications to execute on a remote server, yet display its user interface locally. Microsoft's presentation virtualization technology, Microsoft Terminal Services, enables remote users to connect to their office desktops from anywhere in the world, taking full advantage of applications, resources, and familiar interfaces even from computers with different operating systems or system capabilities. Administrators can access system management tools from remote locations, for example, or applications can be run on a server and accessed by remote users.

Presentation virtualization enables customers to centralize and secure data, reduce cost of managing applications, reduce test costs for compatibility between the OS and applications, and potentially improve the performance of systems overall.

Desktop Virtualization

When server virtualization is used host client OSEs for remote access, this approach is often called desktop virtualization. While the principles of desktop virtualization are similar to server virtualization, this approach can be useful in a variety of situations. One of the most common is to deal with incompatibility between applications and desktop operating systems. For example, suppose a user running Windows Vista needs to use an application that runs only on Windows XP with Service Pack 2. By creating a VM that runs this older operating system, then installing the application in that VM, this problem can be solved. Microsoft VirtualPC is an example of a solution in this space to help address the scenario for hosting VMs in a desktop environment for application compatibility.

Application Virtualization

Application virtualization helps isolate the application running environment from the operating system install requirements by creating application-specific copies of all shared resources and helps reduce application to application incompatibility and testing needs. With Microsoft SoftGrid, desktop and network users can also reduce application installation time and eliminate potential conflicts between applications by giving each application a virtual environment that's not quite as extensive as an entire virtual machine. By providing an abstracted view of key parts of the system, application virtualization reduces the time and expense required to deploy and update applications.

Comprehensive Management in a Familiar Environment

Virtualization technologies provide a range of benefits. Yet as an organization's computing environment gets more virtualized, it also gets more abstract. Increasing abstraction can increase complexity, making it harder for IT staff to control their world. The corollary is clear: If a virtualized world isn't managed well, its benefits can be elusive.

To a large degree, the specifics of managing a virtualized world are the same as those of managing a physical world, and so the same tools can be used. To this end, Windows Server virtualization and the Microsoft System Center family of products includes many management features designed to make

managing virtual machines simple and familiar while enabling easy access to powerful VM-specific management functions.

Having multiple management interfaces excludes Virtual machines from network-wide shared management tools, making problems more difficult to diagnose and address than necessary. System Center family is designed to provide an integrated management experience for all your virtual and physical resources in the same industry-standard tools that administrators are already using to manage large numbers of physical server resources. When an administrator checks the status for a group of servers, issues on virtual machines are presented along with issues on physical servers.

Using a familiar environment to manage virtual resources reduces the learning curve for system administrators, enabling administration teams to reuse knowledge they already have to manage a new virtualization environment. Standardizing on Windows also makes it easy to find support from Microsoft's far-reaching partner ecosystem. System Center is designed to help businesses create self-managing dynamic systems, where the management and monitoring tools are able to diagnose and address problems in an automated fashion with as little human interaction as possible.

For more details of how each of these components function and their specific usage benefits, please refer to www.microsoft.com/virtualization.

Addressing Key Business Needs

In this section we will see how Hyper-V helps address some of the key solution scenarios:

- Server consolidation
- Business continuity and disaster recovery
- Testing and development
- Moving to the dynamic datacenter
- Branch office management

Server Consolidation

One of the leading drivers for adoption of virtualization technology is server consolidation. Businesses are under pressure to ease management and reduce costs while retaining and enhancing competitive advantages, such as flexibility, reliability, scalability, and security. The fundamental use of virtualization to help consolidate many servers on a single system while maintaining isolation helps address these demands.

Cost Savings

Reducing the number of servers means more than just cost reduction in hardware expenditures. Power consumption for servers and heating problems—rapidly becoming pain points for data centers, large and small—are reduced by deploying fewer servers. Consolidation also leaves a smaller data center physical footprint, resulting in cost reduction in facilities management and real estate.

Deploying virtual machines on a standard platform of reliable, enterprise-class servers improves systems availability and reduces management costs.

Optimizing Infrastructure

Today, most dedicated servers run at far below their capacity and only utilize 5% -15% of the actual hardware capabilities. This low asset utilization is a problem created by the lack of flexibility in utilizing computing resources and the difficulty in estimating how much capacity would be required by the workloads. Traditionally, most organization allocate server resources for production workloads based on processing power, storage, and memory to handle anticipated peak loads and unanticipated usage spikes rather than having optimal capacity to meet their normal operating requirements. The result is that most of the additional capacity allocated for peaks sits idle rather than working to process current workloads. Such workloads are great candidates for consolidation using virtualization and allocating resources based on usage needs and balancing the total computing resources across several virtual machines.

Server virtualization also enables previously unused or under-used server capacity to be better utilized. Rather than dedicate a server to a task that leaves most of its capacity untapped, that server can become a host to virtual machines, apportioning its resources to multiple workloads.

Hyper-V with System Center Operations Manager provides for the same kinds of peak load handling, clustering, and security previously available only with dedicated servers.

Flexibility

The new architecture in Hyper-V adds flexibility to consolidated servers. By enabling virtual machines to take advantage of powerful features like multi-core technology, improved disk access, and greater memory support, Hyper-V improves scalability and performance of the virtualization platform. Combined with the rest of the Windows Server 2008 capabilities, Hyper-V now enables you to consolidate most workloads including 32-bit and 64-bit workloads on a single system and helps you balance 64-bit technology adoption with continued support for 32-bit workloads that are already in your environment.

Business Continuity and Disaster Recovery

Business continuity is the ability to minimize both scheduled and unscheduled downtime. That includes time lost to routine functions, such as maintenance and backup, as well as unanticipated outages. Hyper-V includes powerful business continuity features, enabling businesses to meet stringent uptime and response metrics.

Disaster recovery is a key component of business continuity. Natural disasters, malicious attacks, and even simple configuration problems like software conflicts can cripple services and applications until administrators resolve the problems and restore any backed up data. Rapid and reliable disaster and business recovery demands minimal data loss and powerful remote management capabilities.

Hyper-V now supports volume shadow copy services (VSS), an automated backup feature that enables point in time backups of running virtual machines without any interruption. Combined with System Center Data Protection Manager or other similar backup technologies from the vast set of Microsoft partners, you can now take these snapshot backups and enable the data to be stored in secure locations, even offsite locations, for when it's needed. In a disaster recovery situation where the original host server can't be recovered, administrators can easily recreate the virtual machine from a backup copy in a matter of minutes to recreate the server in another location and minimize overall downtime. What's more, now with the standard VHD format for virtual machines, you can now confidently restore the virtual machine in the remote location on any hardware resource with Hyper-V platform enabled.

System Center Operations Manager's health monitoring feature, combined with Hyper-V capabilities, now enables administrators at remote locations to see the states of servers in real time. It also responds programmatically to server problems, potentially using administrator-created scripts to launch disaster recovery tasks without manual intervention. System monitoring is useful for contingency planning, for example, showing the minimum capabilities that would be required of a server being called into service to take over for one that fails.

One of the core features of Hyper-V, Quick Migration, has been specifically designed for improving business continuity. In combination with Windows Server 2008's clustering support in Enterprise and Datacenter editions, Quick Migration enables high availability features for virtual machines, so if one server fails, its workload can be picked up by another node member with minimal interruption in user access. This feature is also useful for improving availability during planned maintenance windows and enables the administrators to move the virtual machines to other systems before performing hardware or software update maintenance on the primary host system.

These features and much more now make Hyper-V a robust virtualization platform that provides business continuity and disaster recovery protection for all your virtual machines, while leveraging the full capabilities of your existing server and management infrastructure.

Testing and Development

Testing and development are frequently the first business functions to take advantage of virtualization technology. Using virtual machines, development staffs can create and test a wide variety of scenarios in a safe, self-contained environment that accurately approximates the operation of physical servers and clients.

For example, a development team can test the latest version of an application on multiple platforms with a variety of virtual hardware capabilities. An IT department can use virtual machines to test deployment of new server and client features.

Hyper-V maximizes utilization of test hardware, reducing costs, improving lifecycle management and improving test coverage.

Extensive Guest Operating System Support

Hyper-V supports 64-bit virtual machines running Windows, specific 3rd party operating systems including some distributions of Xen-enabled Linux, enabling virtual machine based test beds to run the vast majority of server applications and workloads. Hyper-V also runs most other major operating systems in 32-bit virtual machines. Because Hyper-V supports simultaneous 64-bit and 32-bit Virtual machines in the same environment, a very wide array of scenarios can be designed, tested, and deployed, all within the Hyper-V virtual machine environment using industry-standard management tools.

Virtual Machine Libraries and Self-service Portals

System Center Virtual Machine Manager includes the ability to store and manage virtual machines in libraries, which is very valuable for testing and development. A library might include virtual machines or templates of virtual machines based on each operating system used throughout the company, enabling development staff to test new products rapidly to understand the impact on all those environments before deploying them to the live network.

In many testing environments, server-level virtual machines have to be created and managed by server administrators—even virtual machines that will only exist for a few hours. That situation can create needless demands on administrators and delays for testers. With SCVMM's self-service portal feature, testers can set up and remove testing Virtual machines as needed, without involving administrators. The administrators still get to control the overall resource allocation for each set of testers and also control the types of virtual machines that can be accessed or created in the network.

Hyper-V provides a strong platform for these capabilities with deep integration with Active Directory and Group Policy support. The fine grained resource control provided by Hyper-V also helps administrators isolate the testing environment via the use of features like VLAN support.

Checkpoints in Testing and Development

Checkpoints, in addition to being a valuable tool for disaster recovery, also provide benefits for testing and development.

Some testing and development procedures involve a lot of waiting for programs and operating systems to install, uninstall, and reinstall. With Hyper-V's checkpoint feature, a virtual machine that has been changed (for example, one where a new application has been installed) can be reset to a previous configuration, minimizing the need to uninstall programs or reinstall operating systems. This also helps test applications across various configurations easily (such as with different service packs applied to the OS), enabling you to save both time and minimizing hardware requirement for the test suite.

Moving Toward the Dynamic Datacenter

Datacenters face increased pressure to optimize hardware and facilities usage, and to increase performance and leverage business intelligence. Hyper-V gives data centers the agility they need to respond to changing needs, and the power and flexibility to design for the future.

Hyper-V together with your existing system management solutions, such as Microsoft System Center, helps realize the dynamic data center vision of providing self-managing dynamic systems and operational agility. Integrating industry-standard monitoring and management tools enables the system to become more and more self-healing as administrators respond to problems. For example, if an administrator adds memory to a server every time that server's memory usage hits a certain level, the system can be instructed to carry out the same kind of correction by automating certain actions to happen when the memory thresholds are reached.

Hyper-V and Microsoft System Center benefits for the dynamic data center include:

- Reduce Total Cost of Ownership (TCO) by consolidating server functions on the most efficient hardware
- Ensure resources are appropriately sized and used
- Support and enhance business processes
- Maximize hardware utilization
- Reduce IT complexity and management
- Simplify and automate the design, deployment, and operation of complex systems

Automated Virtual Machine Reconfiguration

The Hyper-V virtual machine configuration capabilities enable advanced management tools, such as System Center Virtual Machine Manager, to reconfigure virtual machines with additional memory, processor cores, storage, and networking, all with minimal downtime. A dynamic data center uses this technology not only to respond to problems, but to anticipate increased demands.

The dynamic data center can provide additional processing power in anticipation of a Web-based promotion, for example. If the payroll system always slows during the last few days of the month, the system can add capacity for that period and free up those resources for other virtual machines after that time has passed.

These changing demands don't even have to be anticipated, because System Center Operations Manager (SCOM) and SCVMM can respond to increased needs as they occur. If an unexpected product review drives a spike in Web traffic, for example, SCOM can detect the server reaching a set threshold of system utilization and use a SCOM task to launch additional web server virtual machines to share the load.

Flexible Resource Control

Virtual machines can also take advantage of flexible resource control, enabling them to use resources that might otherwise go idle.

For example, an application that requires 2 GB of memory might run better with 4 GB. While it wouldn't trigger an administrator alert running in a 2GB VM, it still wouldn't be running up to its capacity. Flexible resource control (memory reserves, in this case) enables the system to set a floor for a particular setting—2 GB of memory, in this case—but give Virtual machines as much extra capacity as the server has available at any time. In this example, whenever the server didn't need memory elsewhere it would dedicate its excess to the virtual machine. Virtual machines that aren't able to take advantage of

resources beyond a certain level can set a ceiling as well, telling the system to use its excess resources beyond that level elsewhere.

Quick Migration

Hyper-V's quick migration features in Windows Server 2008 Enterprise and Datacenter editions leverage failover clustering to enable running virtual machines to be moved to other servers with minimal downtime. Dynamic data centers leverage quick migration to make sure applications and servers are running on hardware with appropriate capabilities for their current needs. A server providing application updates, for example, could migrate to a more powerful server in anticipation of a company-wide software update.

Utilization Counters

Hyper-V utilization counters provide server administrators with detailed server load and performance information to facilitate planning and analysis. The feature helps convert server processor time, bandwidth usage, logged-in time, or other metrics to billable dollars.

Branch Office Management

Branch offices face several challenges like server deployment, business continuity, and the need for remote management due to limited or nonexistent local IT departments.

Hyper-V includes several features that enable remote and hands-off management, often eliminating the need for local IT staff. Routine functions, such as data backup, can be automated. Servers can address many problems without administrator assistance, using features such as Hyper-V's automated virtual machine reconfiguration.

Like datacenters, branch offices benefit from Hyper-V features enabling server consolidation, business continuity and disaster recovery, development and testing, and even dynamic datacenter functionality.

Server Consolidation in the Branch Office

Server consolidation is a core scenario even in a remote environment as most workloads in a branch environment are not heavily taxed. Rather than using multiple small servers, each dedicated to a function like e-mail services, print services, faxing, or vertical applications, those servers can be virtualized on a single mid-level or high end server, and helps you save on hardware and manageability.

Virtualization enables cost reductions in staff, management, and facilities. Moving branch offices to virtualization enables remote management, which reduces or eliminates the need for local IT staff. A single-server approach with virtual machines taking over for previously dedicated servers also means reduced power requirements, reduced space requirements, and having only one (or fewer) server to manage and back up.

Business Continuity/Disaster Recovery in the Branch Office

Branch offices can use virtualization technology to leverage business continuity technologies otherwise available only to larger data centers. With Windows Server 2008 and Hyper-V's business continuity features, clustering and remote management become cost-effective even in smaller branches. Should a

disaster occur at a branch office, the central office IT staff can create and test a full complement of virtual machines with the branch's own data, send the virtual machines to the branch by means of high-speed Internet connection or other media, and have the branch operating again with significantly less downtime than rebuilding a physical environment.

Development and Testing for the Branch Office

With virtualization technology, an entire network with multiple servers can be designed, assembled, and tested in a central-office IT department. Its Virtual machines can then be installed remotely or shipped to a branch office on one or more DVDs, eliminating the need to contract with local technicians. The entire process is managed from the central office with little or no need for a local IT staff.

Improving Agility in the Branch Office

One of the biggest challenges with a remote infrastructure environment is that not all workloads can be easily and quickly deployed across all the branches of an organization. Hyper-V helps branches by minimizing hardware dependencies and also using an industry standard VHD format to ensure portability. Combined with System Center Virtual Machine Manager's template and placement capabilities, you can now quickly deploy applications and workloads across a number of branches quickly and manage them remotely.

Summary

Hyper-V, a key feature of Windows Server 2008, is a key component of the Microsoft datacenter-to-desktop virtualization strategy. Other components of this strategy include:

- Presentation virtualization with Microsoft Terminal Services
- Desktop virtualization with Microsoft Virtual PC
- Application virtualization with Microsoft SoftGrid

All Microsoft virtualization solutions are managed with familiar tools in Windows Server 2008 and the optional Microsoft System Center suite. The open architecture of Hyper-V solutions enables easy integration with third-party management tools. Standardizing management with industry-standard tools means an easier learning curve for administrators and outside support staff.

With Hyper-V, Microsoft provides a hypervisor based virtualization platform that enables flexibility through reducing costs, increasing hardware utilization, optimizing infrastructure, and improving server availability. Hyper-V enables Virtual machines to take advantage of enhanced security, including hardware-level security features.

Server consolidation, reducing costs, is the main reason businesses adopt virtualization. Other drivers include:

- Business continuity and disaster management, keeping the business running reliably
- Testing and development, enabling testing in virtual environments rather than on "live" computers

Hyper-V Product Overview

- Moving to the dynamic datacenter, optimizing server utilization and providing for self-managing systems
- Branch management, eliminating the need for local IT staff

Hyper-V helps reduce TCO, optimize resource utilization, and enable network administrators to focus on areas where they can add value, rather than merely perform routine functions. This means cost savings in both staff and training.

Hyper-V is the virtualization platform that provides the greatest flexibility because of dynamic, reliable and scalable platform capabilities combined with a single set of integrated management tools to manage both physical and virtual resources, which enables you to create an agile and dynamic datacenter and progress toward achieving self managing dynamic systems. Hyper-V, a key feature of Windows Server 2008 provides better reliability, greater scalability and dynamic capabilities that allows you to virtualize most workloads in your infrastructure.

In addition to leveraging existing individual and collective knowledge of the ITPro community, Microsoft and its partner ecosystem provide broad support that enables you to deploy applications on Microsoft's virtualization platform with confidence and peace of mind.

Windows Server 2008 Hyper-V

Microsoft Corporation | Product Overview