Windows Server on WAAS: Reduce Branch-Office Cost and Complexity with WAN Optimization and Secure, Reliable Local IT Services

What You Will Learn

Windows Server on WAAS reduces the cost and complexity of supporting branch-office IT operations by integrating a broad set of Microsoft Windows Infrastructure services with Cisco® WAN optimization. As this document discusses, this program from Cisco increases branch-office employee productivity by delivering LAN-like performance of centralized applications and increased efficiency and availability of local IT services.

The branch-office appliance includes Microsoft Windows Server 2008 Release 2 (R2) or Microsoft Windows Server 2008 Server installation on the Cisco Wide Area Application Services (WAAS) platform, which communicates over the WAN to a Cisco WAAS appliance and applications in the data center (Figure 1). Microsoft Windows branch-office infrastructure services include Microsoft Active Directory, Domain Name System (DNS) server, Dynamic Host Configuration Protocol (DHCP) server, print services, Microsoft Windows deployment services, Microsoft Windows Server update services, and other infrastructure services to branch-office users.

Figure 1. Windows Server on WAAS

Cisco Data Center Solutions

The Cisco data center solution is built on a strong foundation of technology innovation to promote IT efficiency and business agility. Cisco and Microsoft both are committed to delivering next-generation IT architectures, from the data center to the branch office, which significantly reduce IT costs, and simplify systems management to enable IT transformation.

These next-generation architectures, spanning centralized systems and systems for branch-office and remote users, unify both companies' technologies into tightly integrated solutions that, with coordinated professional services, speed deployment cycles to reduce implementation and operations risks.

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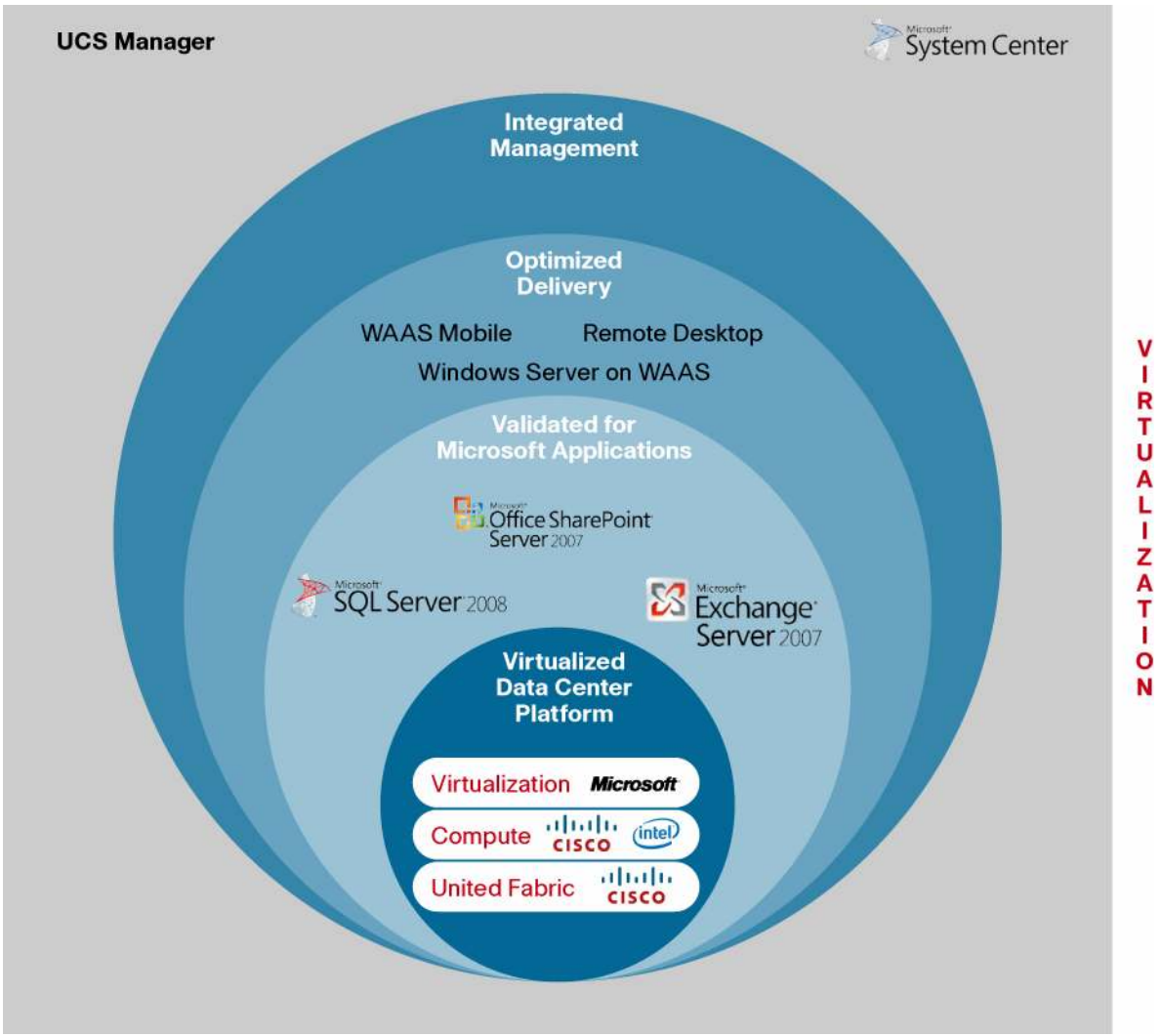
Four Solutions

Windows Server on WAAS incorporates four solutions, shown in Figure 2.

Figure 2. Windows Server on WAAS Incorporates Four Solutions



- **Virtualized Data Center Platform:** Combines the Cisco Unified Computing System™ (UCS), which includes standards-based, multicore x86-architecture blades and rack servers and Microsoft Windows Server Hyper-V into a cohesive system optimized to run business-critical applications on physical and virtual servers
- **Cisco Validated Designs for Microsoft Applications:** Provide tested and validated reference architectures for the virtualized data center platform, with Cisco server load balancing and WAN optimization; Microsoft SharePoint, Exchange, and SQL Server applications; and third-party storage, to speed deployments and reduce implementation and operation risks
- **Branch-Office and Mobile User Optimized Delivery:** Combines Cisco WAN optimization, which accelerates application performance to branch-office and mobile users and reduces bandwidth use, with Microsoft applications and Microsoft Windows Infrastructure services; Windows Server on WAAS from Cisco integrates Microsoft Windows Server on the Cisco WAN optimization appliance in the branch office, allowing flexible deployment of applications, infrastructure, and Microsoft Windows Infrastructure services across branch-office and data center locations

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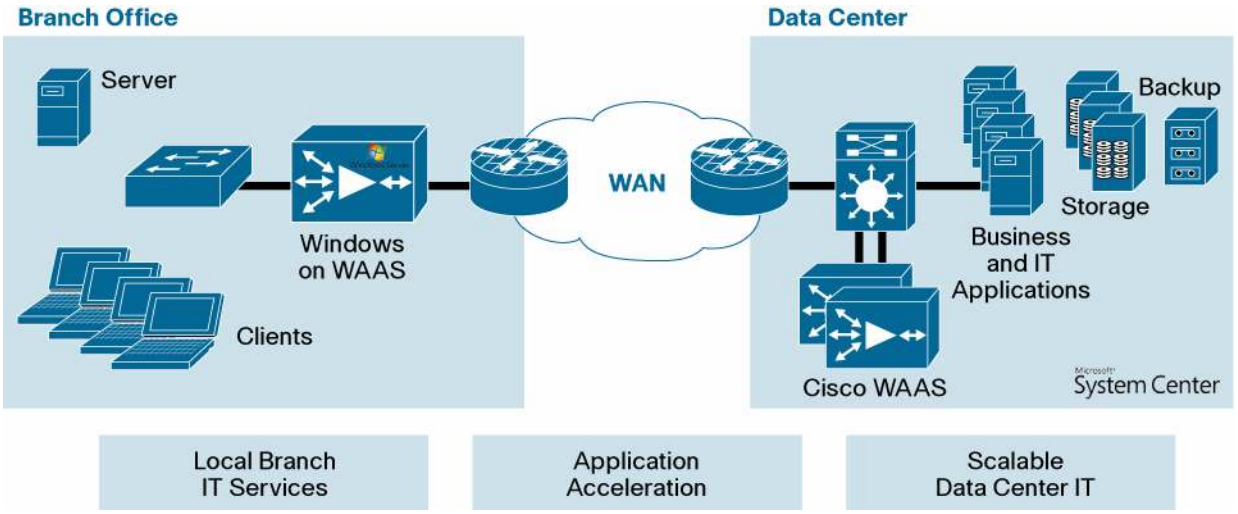
- **Integrated Management:** Combines Cisco UCS Manager and Microsoft System Center for cohesive control of IT infrastructure spanning the data center and branch-office and mobile users from a single user interface

These four innovative solutions were designed to deliver IT efficiency and business agility through next-generation architectures and simplified management. They shorten the time spent performing integration during deployment to reduce implementation and operation risks.

About Cisco WAAS

Cisco WAAS is a comprehensive WAN optimization and application acceleration solution that is a critical component of Cisco Borderless Networks and Data Center 3.0 solutions. Cisco WAAS accelerates applications and data over the WAN, optimizes bandwidth, empowers cloud computing, and provides local hosting of branch-office IT services, all with industry-leading network integration. Cisco WAAS allows IT departments to centralize applications and storage while maintaining productivity for branch-office and mobile users. Cisco WAAS, which includes an appliance at the data center and one at each branch location, allows IT departments to centralize applications and storage in the data center, deliver LAN-like application performance to the branch office, and provide locally hosted IT services while reducing the branch-office device footprint (Figure 3).

Figure 3. Cisco WAAS Architecture



Cisco WAAS provides numerous WAN optimization capabilities that help improve application performance and mitigate the need for costly WAN bandwidth upgrades. Cisco WAAS employs the following techniques to improve application delivery and performance over the WAN: transport flow optimization (TFO), data redundancy elimination (DRE), persistent LZ compression, and protocol-specific application acceleration.

Bandwidth Reduction

TFO improves TCP throughput by mitigating WAN behaviors associated with packet loss, congestion, and long networks. DRE inspects TCP traffic to identify redundant data patterns and then quickly replaces them with signatures that the peer Cisco WAAS appliance can use to reproduce the original data. DRE reduces bandwidth consumption and the effects of latency because fewer packets need to be exchanged over the WAN to achieve the same level of throughput. DRE can provide up to 100:1 compression based on application, data, and workload.

Cisco WAAS also implements persistent LZ compression with a connection-oriented compression history to further reduce the amount of bandwidth consumed by a TCP connection. This compression can be used in conjunction with DRE or independently.

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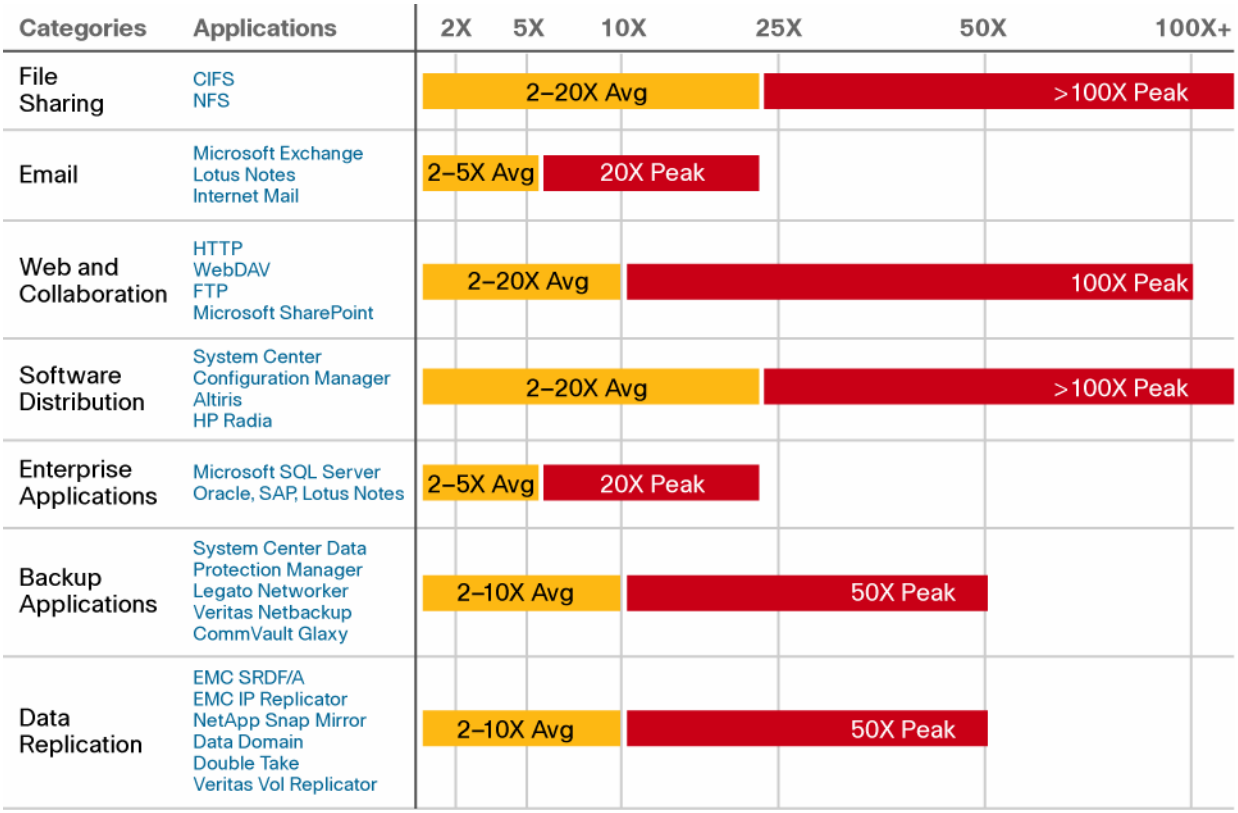
Application Acceleration

Cisco WAAS provides application-specific acceleration capabilities that work in conjunction with other WAN optimization features to provide industry-leading acceleration for centralized applications delivered over the WAN, and which, unlike competitive solutions, have been validated by the application vendors themselves.

Cisco WAAS supports a broad range of applications accelerated using protocol-specific optimizations, accelerating Microsoft applications including Microsoft Windows File Sharing (Common Internet File System [CIFS] and Server Message Block [SMB]), print services, Exchange, and SharePoint (over HTTP and HTTPS) and Microsoft Windows Media Player. This support allows customers to deploy fully supported solutions to accelerate various enterprise applications.

Figure 4. Typical and Peak Performance Improvements Provided by Cisco WAAS



Centralized Management

Cisco WAAS deployments are managed through the secure, scalable Cisco WAAS Central Manager. Up to 2000 Cisco WAAS appliances can be managed by a single Cisco WAAS Central Manager, which can also be deployed in a highly available configuration. All communications between Cisco WAAS appliances and the Cisco WAAS Central Manager are encrypted using SSL to help ensure data privacy.

Windows Server on WAAS

In addition to powerful WAN optimization and application acceleration features, Cisco WAAS provides a Microsoft validated virtualization platform that allows the migration of a broad range of Microsoft Windows–based Infrastructure branch services and applications. The validation of the Cisco WAAS virtualization platform through the Microsoft Server Virtualization Validation Program (SVVP) allows enterprises to deploy Windows Server on WAAS devices safely and securely.

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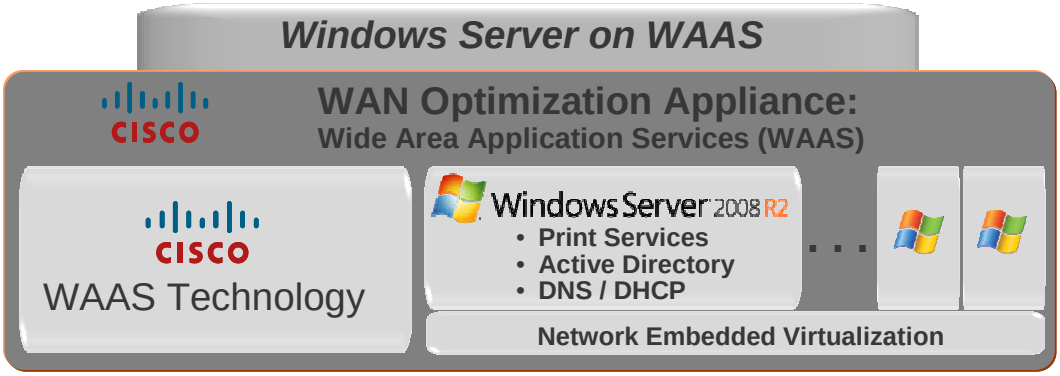
Windows Server on WAAS comprehensively addresses branch-office IT delivery challenges by providing Microsoft Windows Server and Cisco WAAS Software integrated on the Cisco WAAS appliances. Using Cisco WAAS, Windows Server on WAAS accelerates access to centralized applications and offloads the demands on WAN bandwidth. Additionally, Windows Server on WAAS provides core branch-office Microsoft Windows IT services such as print, Active Directory, DNS, and DHCP, Microsoft Windows deployment services, and Microsoft Windows Server update services, as well as other Microsoft Windows–based applications, providing services and functions to branch-office users (Figure 5).

Figure 5. Windows Server on WAAS Accelerates Centralized Applications and Provides Local Hosting of Core Microsoft Windows IT Services and Other Microsoft Windows–Based Applications in the Branch Office



Using Windows Server on WAAS, customers can centralize relevant IT infrastructure for storage, backup, and applications such as Microsoft SharePoint and Exchange and other enterprise services by mitigating the effects of WAN latency for branch-office users. At the same time, applications and services such as Microsoft System Center Configuration Manager (SCCM), print, Active Directory, DNS, and DHCP can be hosted at the branch office to provide local access. Local hosting of print services avoids WAN round-trips for large print files, while local Active Directory services for authentication and login provide secure access to branch-office infrastructure even during a WAN outage. Using Windows Server on WAAS, customers can host both the core IT services and other Microsoft Windows–based applications at the branch office without the costs of deploying and managing additional dedicated branch-office servers.

Cisco has tested and validated the Cisco WAAS network-embedded virtualization layer—Cisco virtual blades—for hosting Microsoft Windows Server 2008 R2, 2008, and 2003 with Service Pack 2 (SP2) or later through the Microsoft SVVP, which allows Microsoft to support Microsoft Windows services running on the Cisco WAAS virtualization component similar to the way it supports Microsoft Windows running directly on server hardware certified through the Microsoft Windows Hardware Qualification Program (WHQL). For more information, see the Microsoft Windows Server catalog at www.windowsservercatalog.com.

Resources for virtual blades are provisioned centrally on the Cisco WAAS Central Manager for unified and centralized management, allowing enterprises to specify the number of CPUs, the amount of memory, and the amount of disk capacity to allocate to each virtual blade on each Cisco WAAS appliance. The virtual blade can be booted remotely using a highly flexible preboot execution environment (PXE) network boot facility, or the boot image can then be transferred to the remote Cisco WAAS appliance in an optimized manner, mounted, and initialized. Administration, ownership, and ongoing management of the virtual blade can be delegated to the appropriate IT business stakeholder and secured through role-based access control (RBAC) to help ensure transparent integration into the existing business process.

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Windows Server on WAAS provides the following important benefits for Microsoft Windows Server administrators:

- Streamlined server provisioning and portability
- Simplified server configuration
- Uncomplicated, standardized server management
- Increased server hardware uptime

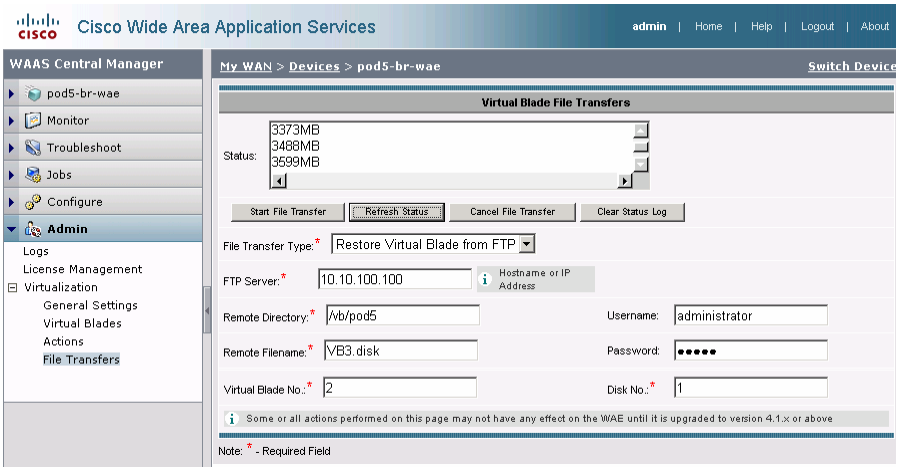
Streamlined Server Provisioning and Portability

Windows Server on WAAS offers increased IT agility with rapid server provisioning capabilities that can be used to quickly deploy core IT services to branch locations. Use of the standard Cisco WAAS appliance virtualization capabilities simplifies OS driver and firmware support requirements for server images, allowing servers to be quickly deployed for Cisco WAAS appliances. For new Cisco WAAS installations, the server image can be staged quickly on the Cisco WAAS appliance in a headquarters location and then shipped to remote locations for easy installation and immediate management using the Cisco WAAS Central Manager (Figure 6).

Figure 6. Ease of Installation of Windows Server on WAAS

After the Cisco WAAS appliances are deployed in branch locations, server provisioning and portability is simplified and managed comprehensively within Cisco WAAS Central Manager. ISO archive images can be deployed remotely, backup and restore operations that include the OS image can be performed using existing virtual blades, and new servers can be provisioned quickly to remote locations using existing, centralized prestaged images. Figure 7 shows the single Cisco WAAS Central Manager screen required to stage an ISO archive operation, back up, restore, or create new virtual blades on a remote Cisco WAAS appliance using existing server images.

Figure 7. Windows Server on WAAS Simplified Server Provisioning, Portability, and Backup with Cisco WAAS Central Manager



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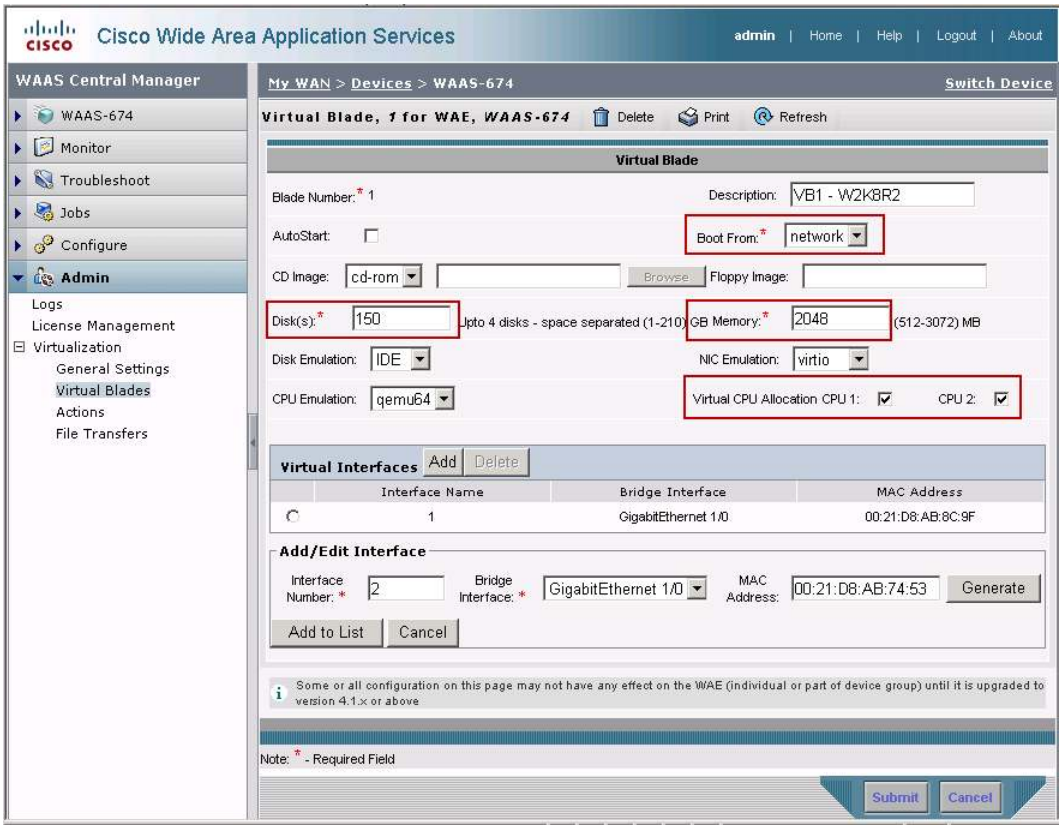
Simplified Server Configuration

Server configuration tasks are simplified in Windows Server on WAAS deployments. CPUs, memory, disk allocations, and other server operating parameters can be configured quickly using the Cisco WAAS Central Manager without visits to remote sites or the need to install new hardware. Network booting using PXE is supported to further enhance the manageability and deployment process of Windows Server on WAAS. Figure 8 shows the initial setup to boot from a network image and the configuration for additional CPUs, memory, and a disk allocated to an existing virtual blade remotely with Cisco WAAS Central Manager.

Figure 8. Windows Server on WAAS Simplified Server Configuration with Cisco WAAS Central Manager: Increasing CPUs, Allocated Memory, and Disk Space



Uncomplicated, Standardized Server Management

Deployment of Windows Servers on WAAS virtual blades simplifies server management tasks. The use of Cisco WAAS virtual blades managed with Cisco WAAS Central Manager extends the benefits of existing management tools and processes because IT departments do not need to replace or relearn the tools they are currently using to manage their branch-office server infrastructure or perform common configuration tasks. Configuration and monitoring tools such as Microsoft System Center are fully compatible with virtual blades managed with Cisco WAAS Central Manager (Figure 9).

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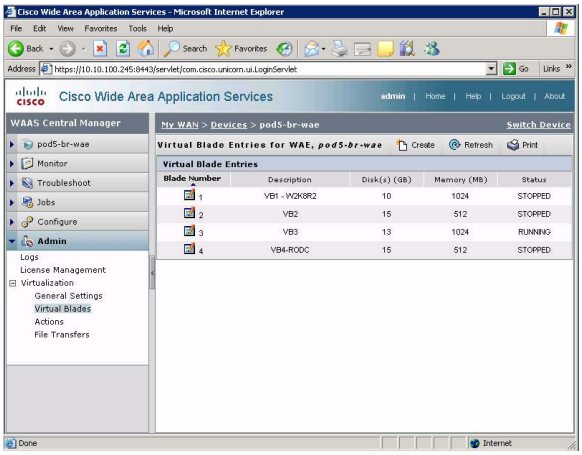
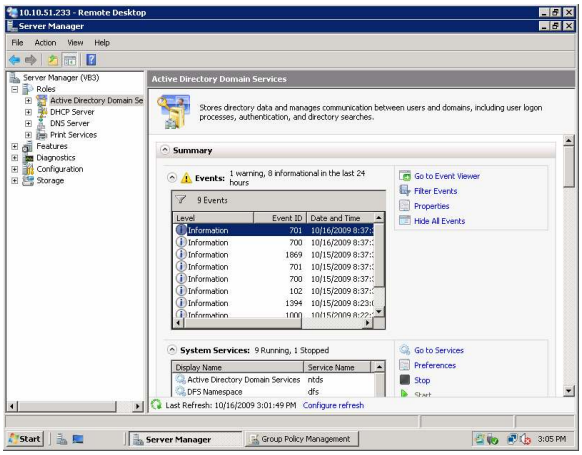
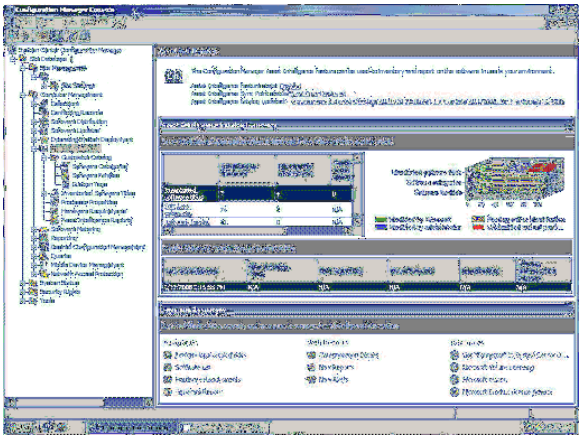
Figure 9. Windows Server on WAAS Virtual Blades Managed with Cisco WAAS Central Manager, Microsoft Management Console, and Microsoft Systems Center







Increased Uptime

Windows Server on WAAS virtual blades running on a Cisco WAAS appliance provides higher availability and better uptime than standard server platforms. Server stability is increased in the Windows Server on WAAS virtual blade environment, with servers requiring approximately 70 percent less patching and service isolation for emulated hardware components such as CPUs and disks. Server uptime is increased with new agility that allows servers to be backed up and restored rapidly. Many Cisco WAAS appliances that host virtual blades also provide redundancy at the hardware level with redundant power supplies, fans, and hardware RAID-5. Four-hour hardware replacement support is also available from Cisco for Cisco WAAS appliances.

Microsoft Windows Server 2008 and Cisco WAN Optimization

Microsoft Windows Server 2008 Core Installation

In addition to a full installation of the Microsoft Windows Server 2008 operating system, administrators can now choose to install only the subset of the binary files that are required by the supported server roles, a minimal environment that avoids installations and additional overhead. This type of installation is called a server core installation. For example, the Microsoft Windows Explorer user interface (or shell) is not installed as part of a server core installation. Instead, the default user interface for a server running a server core installation is the command prompt.

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Choosing the server core installation option on a server reduces administrative effort and helps limit security risks. A server core installation provides these benefits by reducing the required software maintenance and management and by reducing the attack surface.

Many Windows Server on WAAS customers use the Microsoft Windows Server 2008 server core installation, which, when deployed on Cisco WAAS virtual blades, is ideal for branch-office IT services such as Microsoft Active Directory, DNS, DCHP, and print services.

Microsoft Windows Server 2008 Release 2

Microsoft Windows Server 2008 R2, released in October 2009, delivers valuable new functions and powerful improvements to the core Microsoft Windows Server operating system to help organizations of all sizes increase control, availability, and flexibility to meet their changing business needs. New web tools, virtualization technologies, scalability enhancements, and management utilities help save time, reduce costs, and provide a solid foundation for information technology infrastructure.

Cisco recognizes the combined value of Cisco WAAS and Microsoft Windows Server 2008 R2 as a powerful branch-office optimization solution. Cisco has validated Microsoft Windows Server 2008 R2 deployment in the Cisco WAAS virtual blade footprint, and the solution has also been validated by Microsoft SVVP.

Microsoft System Center Operations Manager 2007 R2

Microsoft System Center Operations Manager delivers end-to-end service management of applications and IT services running across the data center fabric, providing greater control and insight into the health and performance of Microsoft Windows Servers and the workloads running on them. With Microsoft System Center Operations Manager 2007 R2, you can reduce the cost of managing your data center and help ensure delivery of IT services at expected and agreed-to levels.

Many enterprises use Microsoft System Center Operations Manager to manage their Microsoft Windows Server software on the Cisco WAAS platform.

Windows Server on WAAS with Microsoft Windows Server 2008 R2 BranchCache

For communication with Microsoft Windows 7 clients, Microsoft Windows Server 2008 R2 BranchCache in hosted cache mode on Windows Server on WAAS can further increase acceleration of centralized IT services and optimize WAN bandwidth use. The combined solution helps customers reduce IT costs and complexity by reducing the hardware footprint required in branch offices.

Cisco WAAS adds new efficiencies to BranchCache at branch-office locations. Cisco WAAS provides WAN optimization and application acceleration for all branch-office traffic being served centrally from the data center. Cisco WAAS can improve the performance of BranchCache by providing WAN optimization and application acceleration for BranchCache traffic that traverses the WAN link without introducing new hardware requirements (Figure 10). Deploying Microsoft Windows Server 2008 R2 BranchCache on a Cisco WAAS appliance eliminates the need for additional server hardware components to host the BranchCache capability, increasing the use of physical space and shared power, networking, and storage.

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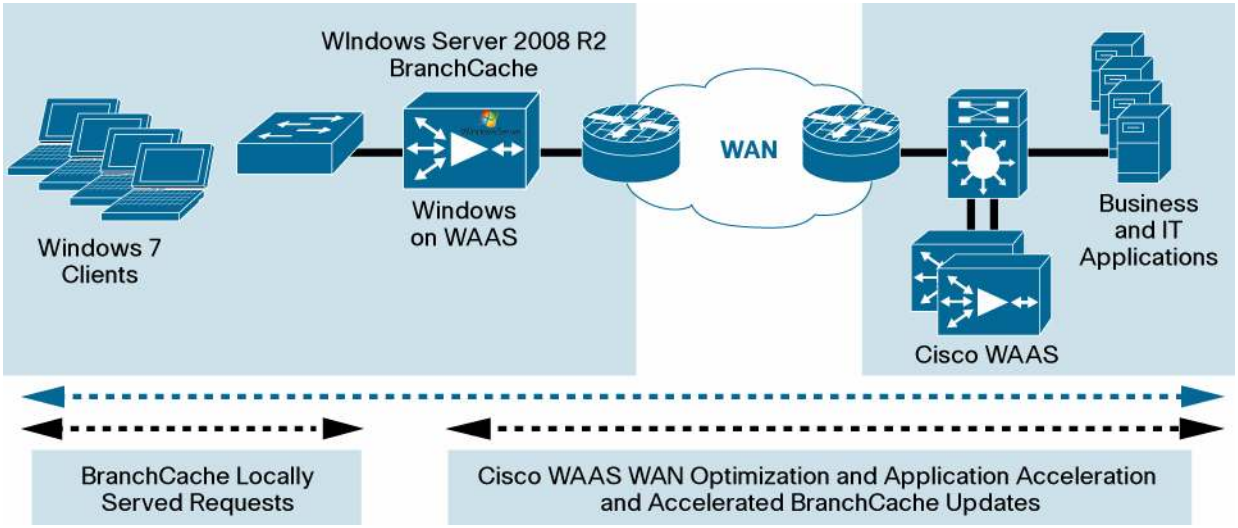
Figure 10. Windows Server on WAAS Accelerates Centralized Applications and Provides Optimized BranchCache Capabilities Locally at the Branch Office



Conclusion: Windows Server on WAAS Delivers Strong Business Benefits

Windows Server on WAAS reduces the cost and complexity of providing IT services in branch locations with accelerated access to centralized applications and secure and reliable local Microsoft Windows Server services.

Integrating Microsoft Windows Server 2008 R2 with the Cisco WAAS platform provides the flexibility to deploy corporate applications and infrastructure services across branch-office and data center locations.

For More Information

- www.cisco.com/go/waas
- www.microsoft.com/windowsserver2008

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Printed in USA C11-612360-00 07/10

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