Cisco Application Networking for Microsoft SharePoint Solutions

Faster Downloads and Site Navigation, Less Bandwidth and Server Processing, and Greater Security and Availability for Global Deployments

What You Will Learn

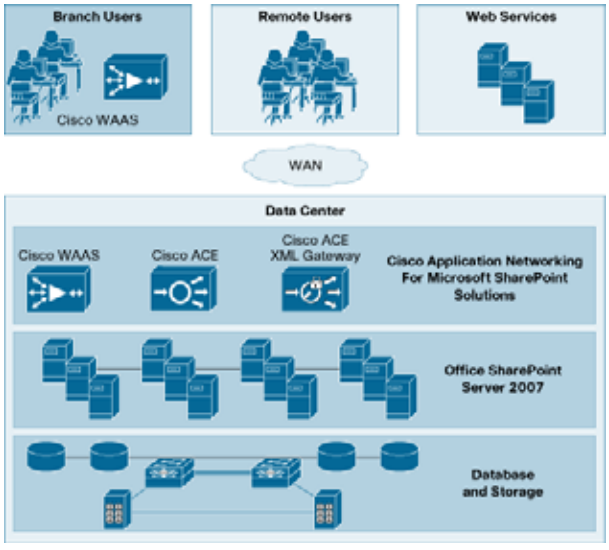
To address challenges associated with today's mission-critical enterprise application deployments, Cisco®, in collaboration with Microsoft, offers Cisco Application Networking for Microsoft SharePoint Solutions, an enterprise network architecture with best practices and implementation guidance that optimizes application availability, performance, and security and lowers application ownership costs (see Figure 1).

This document shows how this solution addresses the following business challenges for Microsoft SharePoint deployments serving global users across challenging WAN links, through data center and WAN application optimization services from the Cisco ACE Application Control Engine and Wide Area Application Services (WAAS) Software products:

- Enterprise class high availability for mission critical applications
- Application response time over limited WAN connections
- Application, server, network, and service-oriented architecture (SOA) security
- Reduced capital and operational costs for applications, servers, and networking

Tests of this solution showed up to 34 times faster downloads, 50 percent faster site navigation, 88 percent less bandwidth utilization, and 71 percent less server processing for Microsoft SharePoint deployments when paired with Cisco Application Networking solutions for specific deployment scenarios. Additional solution benefits include increased application security and availability.

Figure 1. Cisco Application Networking for Microsoft SharePoint Solutions



Business Challenge

In today's globally networked economy, where enterprise application availability, performance, and security are tightly linked to customer success and profits, application stakeholders are faced with new challenges.

While applications expand to automate new business processes and serve more geographically and organizationally dispersed user populations, service levels and costs are increasingly scrutinized, and increased complexity or stifled innovation is sure to affect productivity and disappoint primary constituents.

To achieve expected service levels and costs in this demanding environment, enterprise application deployments are more likely to run in one location isolated from a second standby site, serve global users through Web browsers and standard Internet protocols, and use a SOA platform.

This new business environment and associated application architecture intensifies four major IT challenges, each of which can be addressed by a strong enterprise network architecture using Cisco Application Networking for Microsoft SharePoint Solutions.

Application Availability Challenges

Increasing business dependence on fewer but larger applications deployed in a central location requires a more careful look at application architecture, including single points of failure and product stability to achieve recovery time and point objectives.

Application Performance Challenges

Limited WAN links and inefficient Internet standard protocols such as HTTP and Extensible Markup Language (XML) result in poor application performance and bandwidth utilization for global users. Further, increased demand on large applications in centralized data centers results in overload on servers that slows application response time.

Application Security Challenges

Significantly increased business risk results from application security breaches from malicious or innocent end users or SOA Web service requests that attack application, server, or operating system vulnerabilities.

Application Ownership Cost Challenges

Increasing scope of application business logic and geographically and organizationally dispersed users, coupled with higher availably, performance, and security needs, requires a new approach to application support to keep costs in line with lean budgets.

Given these significant challenges, it is increasingly important to turn an application-savvy infrastructure vendor, such as Cisco, whose solutions cost-effectively address today's business-level application and IT challenges, and that is committed to rigorous feature and system quality testing, global and local-language 24-hours-a-day support, and a strong history of security expertise (see Table 1).

Table 1. Application-Savvy Infrastructure Vendor Requirements for Today's Enterprise Application Deployments

Requirements	
• Strong application optimization solutions • Lower application ownership costs • Rigorous feature and system quality testing	• Global and local-language 24-hours-a-day support • Outstanding security history and experience • Strategic partnerships with application vendors

Equally important is an application infrastructure vendor that partners with leading application vendors, such as Microsoft, to yield tested, documented, and validated joint architectures that optimize application availability, performance, and security and lower application ownership costs.

Business Benefits

Cisco Application Networking for Microsoft SharePoint Solutions offers optimized application availability, performance, security, and costs by providing application optimization services as described here.

Microsoft SharePoint Application Availability

Cisco ACE application optimization services for high availability:

- Cross-data center load balancing: Efficiently routes end-user and Web services requests to the best available data center
- Server load balancing: Efficiently routes end-user and Web services requests to the best available server
- Application health monitoring: Continuously monitors application and database availability
- Network platform health monitoring: Helps ensure continuity of business operations through mirroring of end-user transaction states across pairs of network devices

Microsoft SharePoint Application Performance

Cisco ACE and WAAS application optimization services for high performance:

- WAN optimization: Provides intelligent caching, compression, and protocol optimization that yields up to 34 times faster downloads, 50 percent faster site navigation, and 88 percent reduction in bandwidth utilization
- Server offloading: Specialized hardware that offers greater processing efficiency for application optimization services (listed in Table 2), which frees up to 71 percent of application server processing and memory to focus on business logic computations

Table 2. Services Offloaded from Servers by the Solution

Service	Description
Cross-Data Center Load Balancing	Replaces domain name system (DNS) server
Server Load Balancing	Replaces Microsoft network load balancing
Secure Sockets Layer (SSL) Termination	Terminates 15,000 connections per second
TCP Connection Management	Significantly reduces TCP connections to server
Application Health Monitoring	Provides availability by monitoring application and database
Traffic Compression	Provides scalable gzip functions
Object Caching	Reduces requests to server
XML Schema Validation	Processes 30,000 schema validations per second

Microsoft SharePoint Application Security

Cisco ACE application optimization services for optimized data security:

- SSL termination: Efficiently encrypts and decrypts SSL-enabled traffic, which facilitates the use of intrusion detection and prevention solutions before traffic reaches the servers, reduces server CPU usage, and centralizes certificate management
- End-user access control: Provides access control lists (ACLs) to protect client-to-server traffic from worms and intruders that attack vulnerable open server ports not used by the application
- XML firewall: Examines SOA Web services requests for compliance to schemas and protects against identity, message-format, and denial-of-service (DoS) attacks

Microsoft SharePoint Ownership Cost

Cisco Application Networking for Microsoft SharePoint Solutions reduces application capital and operational costs through:

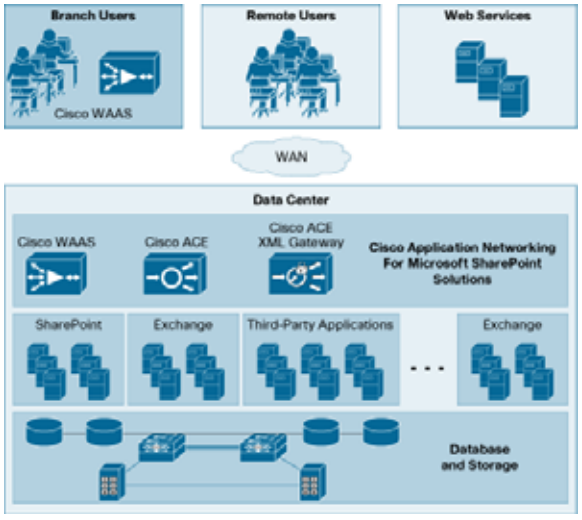
- Server cost reduction: Offloading of application optimization services listed in Table 2 from servers to cost-effective network devices frees up to 71 percent of server processing and memory needs to focus on business logic computation

Table 3. Operating Cost Reduction from Application Optimization Services

Cost Reduction	Description
WAN Bandwidth Utilization	Up to 88% savings
Server Power, Cooling, Space, and Administration	Up to 71% savings
Application Deployment Administration	Virtualization of application services

- Networking cost reduction: Virtualization of application optimization services supplies such services for multiple Microsoft SharePoint solutions as well as other enterprise applications (see Figure 2)
- Operating cost reduction: Application optimization services reduce operating costs as shown in Table 3

Figure 2. Virtualization of Application Optimization Services



Solution

Cisco Application Networking for Microsoft SharePoint Solutions combines the Cisco ACE and WAAS products with the Microsoft SharePoint architecture to provide optimized availability, performance, security, and cost of ownership.

Microsoft SharePoint with Cisco ACE

Within the Microsoft SharePoint architecture, scaling to handle more end users requires the addition of Microsoft SharePoint application server instances, which creates the need for load balancing (see Figure 3). Although Microsoft Windows Server 2003 can provide software-based server load balancing and SSL termination, Cisco ACE can offer higher performance for these two application optimization services in addition to end-user access control, server health monitoring, and TCP connection management.

Virtualization within Cisco ACE allows a single active-active pair of Cisco ACE products to serve multiple Microsoft SharePoint applications as well as other Microsoft and non-Microsoft enterprise applications. Further, if Cisco ACE is already deployed in the data center, additional virtualized contexts can be added to accommodate new Microsoft SharePoint applications without the need to order and configure additional equipment.

Additionally, Cisco ACE virtualized contexts can be combined with Cisco ACE role-based access control (RBAC), which constrains the commands and actions for unique application, database, security, and systems management administrators. Although Cisco ACE comes prepackaged with a number of predefined roles, others can be customized as needed.

Cisco ACE specifically provides server load balancing session persistence for Microsoft SharePoint Solutions through the source IP methodology. Further, if the application architecture requires, Cisco ACE can decrypt SSL traffic for intrusion detection and prevention and then re-encrypt traffic to the server with roughly the same server savings as if the SSL was decrypted at the Cisco ACE. Because the database is typically a clustered single instance, Cisco ACE is not used at that part of the architecture.

When Cisco ACE is combined with Microsoft SharePoint, tests show significant server processing reduction, as discussed in the “Testing” section later in this document.

Microsoft SharePoint with Cisco WAAS

Completing any Microsoft SharePoint Solution business transaction involves numerous components of the application architecture, including the client, application servers, database servers, storage hardware, networking hardware, LAN, and WAN.

Each transaction typically requires several steps that, when requested by a remote user, travel over the WAN and introduce network delay that slows end-user performance. When network delay is significant because of constrained or overburdened bandwidth, distance of users to servers, or a high number of steps to complete a transaction, end-user performance and bandwidth utilization improvement can be achieved through Cisco WAAS technologies such as data redundancy elimination (DRE), TCP Flow Optimization (TFO), and compression.

When Cisco WAAS is combined with Microsoft SharePoint, tests show significant round-trip time (RTT) and bandwidth reduction, as discussed in the “Testing” section later in this document.

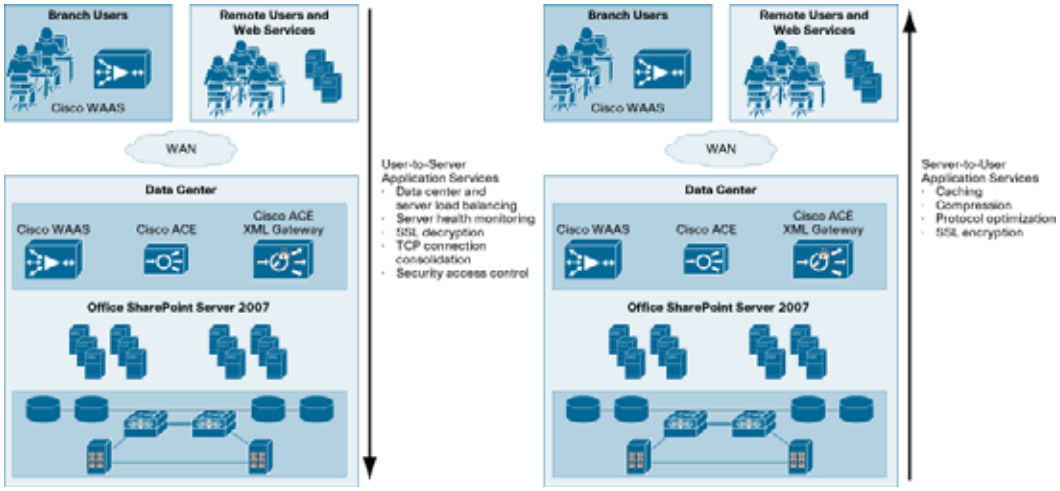
Solution Deployment

Cisco ACE, ACE XML Gateway, and WAAS reside in the data center and are arranged to provide

virtualized application optimization services for multiple Microsoft SharePoint deployments as well as other enterprise applications.

Because of their unique location, these solutions can take intelligent action on the end-user traffic before it is routed to the Microsoft SharePoint application servers, including load balancing, server health monitoring, SSL decryption, TCP connection consolidation, and security access control (see Figure 3). Cisco Application Networking for Microsoft SharePoint Solutions provides these services cost effectively, freeing up to 71 percent of server processing and memory.

Figure 3. Data Center Application Optimization Services



Cisco WAAS also resides in the branch office and is set up to provide application optimization services for all application users in that location. The Cisco WAAS branch-office and data center deployment together offer a WAN optimization service through the use of intelligent caching, compression, and protocol optimization.

When the Microsoft SharePoint application servers respond to end-user requests, the response is most efficiently passed across the WAN, with minimal bandwidth utilization and maximum speed. Commonly accessed information is cached both at the Cisco WAAS solution in the branch office and at the Cisco ACE solution in the data center, significantly reducing the burden on the servers and the WAN.

The recommended best practices and implementation guidance for Cisco Application Networking for Microsoft SharePoint Solutions, including specific configurations for each Cisco network solution, can be found in the Cisco Application Networking for Microsoft SharePoint Solutions Deployment Guide at http://www.cisco.com/go/OptimizeMyApp.

The Cisco ACE solution can be deployed in the data center as a module in the Cisco Catalyst® 6500 Series Switches or as an appliance. The Cisco WAAS can be deployed in the branch office as a module in a Cisco Integrated Services Router or as an appliance.

Testing

Cisco, in collaboration with Microsoft, conducted a series of function, load, and performance tests over 6 months that resulted in the Cisco Application Networking for Microsoft SharePoint Solutions architecture, best practices and implementation guidance.

WAAS Performance Testing

Two types of user transaction tests were conducted: site navigation—personal site, team site, document library, and search site—and document downloads—500-KB and 2-MB Microsoft Word documents. Both HP LoadRunner and a Microsoft testing tool were used to simulate user transactions. Four simulated WAN links were tested to represent typical branch office–to–data center connections, as shown in Table 4.

Table 4. Cisco WAAS for Microsoft Office SharePoint Server 2007: Four Simulated WAN Links

Description	Bandwidth	Round-Trip Latency	Packet Loss
Intercontinental Low Bandwidth	512 Kbps	200 ms	0.5%
Intercontinental High Bandwidth	4 Mbps	200 ms	0.5%
Intracontinental Low Bandwidth	1.544 Kbps	80 ms	0.1%
Intracontinental High Bandwidth	45 Mbps	80 ms	0.1%

Representative summaries of test results for user performance improvements in web site navigation and document downloads are shown in Tables 5 and 6 and Figure 4.

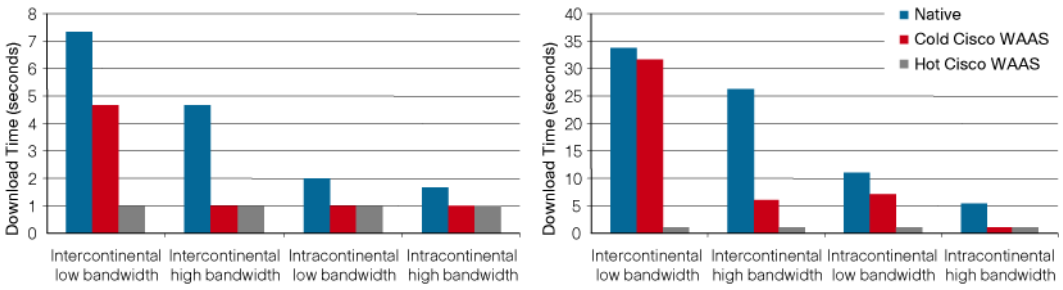
Table 5. Cisco WAAS for Microsoft Office SharePoint Server 2007: Site Navigation

WAN Link	Without Browser Cache	With Browser Cache
Intercontinental Low Bandwidth	47% faster	53% faster
Intracontinental Low Bandwidth	39%	41%
Intracontinental High Bandwidth	29%	28%

Table 6. Cisco WAAS for Microsoft Office SharePoint Server 2007: Document Download

WAN Link	2-MB Word Document	500-KB Word Document
Intercontinental Low Bandwidth	34X faster	7X faster
Intercontinental High Bandwidth	26X	4X
Intracontinental Low Bandwidth	11X	2X

Figure 4. 2MB Document Download (left) and 500KB Document Download (right)



From these results, it is clear that there are strong network performance benefits to be gained by adding Cisco WAAS in geographically far-reaching Microsoft Office SharePoint Server 2007 deployments with high-latency or low-speed WAN connections.

Representative summaries of test results for bandwidth utilization improvements for Web site navigation transactions without Cisco WAAS and then with Cisco WAAS show up to 88 percent decrease in bandwidth utilization. Such tests included a significant amount of commonly used data such as broadcast reports. In usage scenarios with much real-time collaboration, less bandwidth utilization savings will be seen from the deployment of Cisco WAAS. As with conclusions drawn from the performance tests, it is clear that strong cost savings can be achieved by deploying Cisco

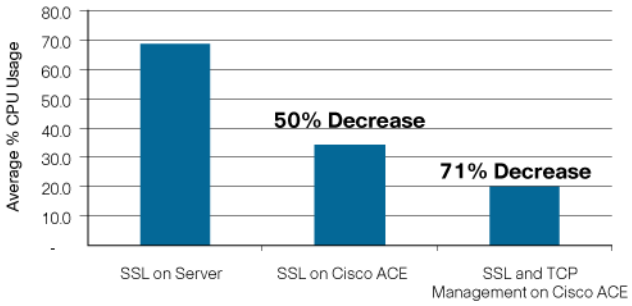
WAAS for Microsoft Office SharePoint Server 2007 for specific scenarios.

Cisco ACE Function and Performance Testing

All Cisco ACE function tests succeeded and the deployed configurations were documented for such tests, which included the following features: server load balancing with persistence, server health monitoring, SSL encryption and decryption, TCP connection management, and end-user access control.

Performance testing that measured server processor savings by conducting application optimization services—SSL termination and TCP connection management—on the Cisco ACE revealed a 71 percent decrease in CPU usage (see Figure 5).

Figure 5. Server Processor Savings from Cisco ACE SSL Termination and TCP Connection Management



Statement of Cooperation

Cisco and Microsoft cooperated in all phases of the Cisco Application Networking for Microsoft SharePoint Solutions testing, including lab setup at Cisco and Microsoft offices, solution function and performance testing, and deployment guide documentation. Cisco and Microsoft jointly validate that the lab setup and solution testing represents best efforts in creating a realistic customer deployment and accurate documentation of such deployment.

For Further Information

Cisco Application Networking Services http://www.cisco.com/go/applicationservices.

Cisco Application Networking partner portal http://www.cisco.com/go/optimizemyapp.

Cisco ACE Application Control Engine product information http://www.cisco.com/go/ace.

Cisco Wide Area Application Services Software product information http://www.cisco.com/go/waas.

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