

Cisco Application Networking for Microsoft Exchange Server 2007 and Office Communications Server 2007



Optimized Availability, Security, and Performance for Microsoft Unified Communications Deployments

To optimize today's mission-critical enterprise application deployments, Cisco® offers validated Cisco application networking solutions for Microsoft Unified Communications installations; enterprise network architecture with best practices and implementation guidance that enhance application availability, security, and performance.

This document shows how Cisco application networking solutions complement Microsoft® Exchange Server and Microsoft® Office Communications Server 2007 deployments serving global users across corporate WAN or Internet connections, enhancing:

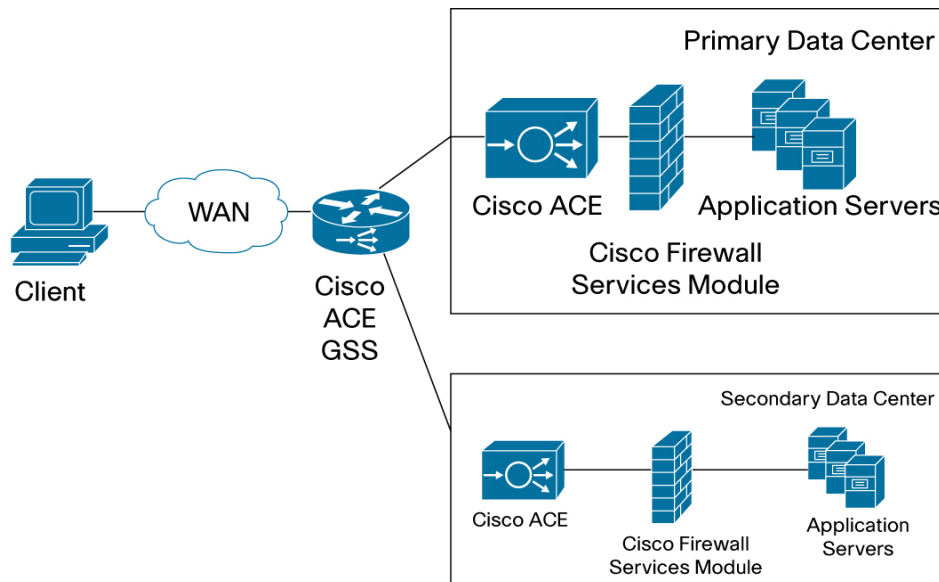
- Enterprise-class availability for mission-critical applications
- Scalability to efficiently support large number of users
- Secure access to confidential data and real-time collaboration
- Optimal use of infrastructure to reduce space, power, and cooling requirements



Two associated deployment guides, created through comprehensive testing at Cisco labs with Microsoft collaboration, document interoperability between Exchange Server and Office Communications Server 2007 and the following Cisco application networking solutions (Figure 1):

- **Cisco ACE Application Control Engine:** Intelligent and virtualized server load balancing, Secure Sockets Layer (SSL) termination, and application health monitoring as a module for the Cisco Catalyst 6500 Series Switches or as a standalone appliance
- **Cisco ACE Global Site Selector (GSS):** Intelligent site workload distribution and failover and Domain Name System (DNS) server offload
- **Cisco Catalyst® 6500 Series Firewall Services Module (FWSM):** Integrated module for the Cisco Catalyst 6500 Series Switches that provides firewall protection against security threats

Figure 1. Cisco Application Networking Solutions



Business Challenge

In today's globally networked economy, new business challenges include enabling employee collaboration, addressing geographically dispersed users, and achieving agility to quickly adjust to changing business conditions. Meanwhile, IT service levels and costs are increasingly scrutinized, and increased complexity or stifled innovation affects productivity.

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 and offer global application access through web browsers and standard Internet protocols.

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 such as Cisco Application Networking for Microsoft Exchange Server 2007 and Office Communications Server.

- **Application availability:** Increasing dependence on fewer but larger applications deployed in a central location requires a careful review of architecture, including points of failure and stability to achieve recovery objectives
- **Application performance:** Increased demand on large applications in centralized data centers may result in overload on servers that slows application response time
- **Application security:** Significantly increased business risk results from application security breaches from malicious or innocent end users that attack application, server, or operating system vulnerabilities
- **Application ownership cost:** Increasing application scope; geographically dispersed users; and higher availability, performance, and security needs require new approaches to keep costs in line with lean budgets

To address these challenges, it is increasingly important to turn to an application-savvy infrastructure vendor such as Cisco, which is committed to end-to-end solutions and global and local-language 24-hours-a-day support, has a strong history of security expertise, and partners with

leading application vendors, such as Microsoft, to yield tested and documented joint architectures.

Business Benefits

Cisco Application Networking complements many applications, including Exchange Server and Office Communications Server 2007 by providing application optimization services as follows:

- **Application availability:** from Cisco ACE and Cisco GSS
 - **Site and server load balancing:** Efficiently routes end-user and web services requests to the best available data center and 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
- **Application performance:** from Cisco ACE
 - **Server offloading:** Specialized hardware frees application server processing and memory to focus on business logic computation services (Table 1)

Table 1. Services Offloaded from Servers by the Solution

Service	Description
Cross-data center load balancing	Intelligently routes load across multiple data centers
SSL termination	Terminates 15,000 connections per second (not tested with Office Communications Server 2007)
TCP connection management	Significantly reduces the number of TCP connections to server
Server health monitoring	Monitors the status of Office Communications Server Front End servers to efficiently route traffic
Traffic compression	Provides scalable gzip functions
Object caching	Reduces the number of requests to server
Cross-data center load balancing	Intelligently routes load across multiple data centers
SSL termination	Terminates 15,000 connections per second (not tested with Office Communications Server 2007)

- **Application security:** from Cisco ACE and Catalyst 6500 Series FWSM
 - **SSL termination:** Efficiently encrypts and decrypts SSL traffic, reduces server CPU use, centralizes certificate management, and provides intrusion detection and prevention solutions (not tested with Office Communications Server 2007)
 - **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
- **Ownership cost:** from Cisco ACE, Catalyst 6500 Series FWSM, and ACE GSS
 - **Server cost reduction:** Through specialized hardware, frees application server processing and memory to focus on business logic computation services (Table 1)
 - **Networking cost reduction:** Through virtualization of application optimization services, reduces space, power, and cooling needs for networking solutions
 - **Operating cost reduction:** Through application optimization services, reduces operating costs

Solution

Cisco Application Networking for Microsoft Exchange 2007 and Office Communications Server 2007 combines Cisco ACE, ACE GSS, and Catalyst 6500 Series FWSM with Microsoft Exchange 2007 and Office Communications Server 2007 to provide optimized availability, performance, security, and cost.

Cisco Application Networking with Microsoft Exchange Server

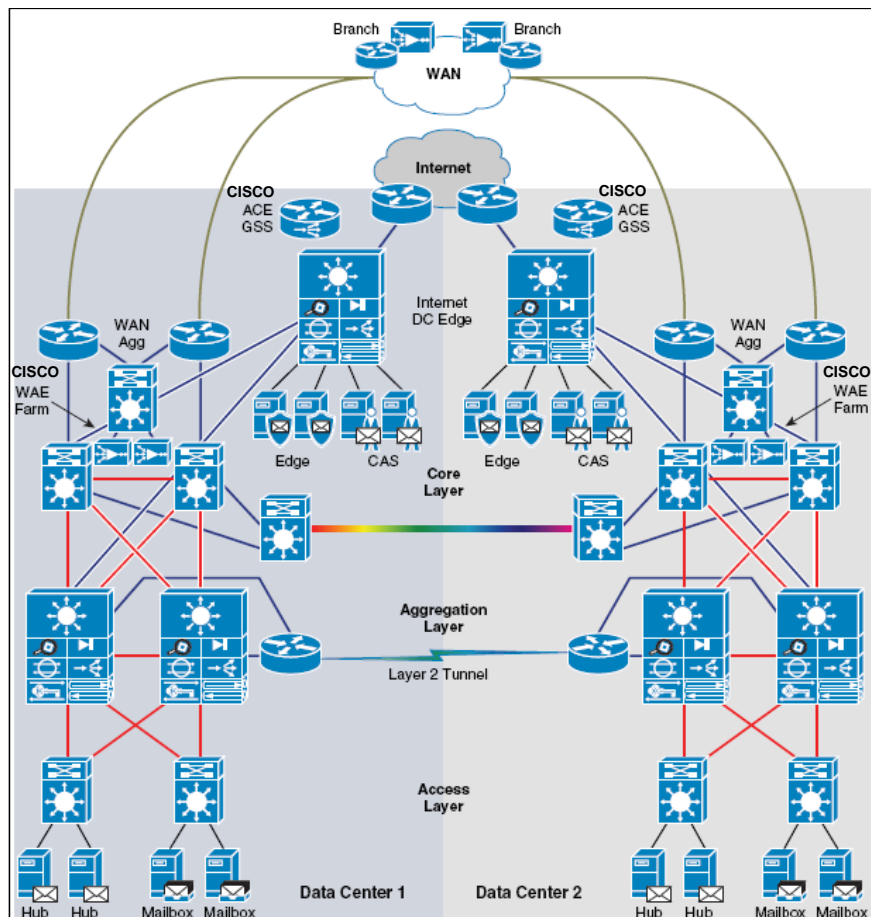
This solution provides reference architectures and best practices for Cisco application networking solutions to optimize the deployment of Exchange Server in one or two data centers for increased application availability (Figure 2).

In this solution, the following Exchange Server roles are deployed in each data center: Client Access Server, Hub Transport Server, Mailbox Server, and Edge Transport Server; Active Directory® is also deployed. The solution includes active and standby options for these roles and Active Directory as appropriate and includes client access from a corporate WAN and the public Internet.

Central to this solution is Cisco ACE GSS, which offers failover protection and workload distribution across sites through site availability, proximity, load, and request source and preferences. Cisco ACE GSS intelligently resolves DNS requests with knowledge of each site's application availability and state from tight integration with Cisco ACE, resulting in DNS server offload and an enhanced user experience.

Cisco ACE, in this solution, resides in each data center to provide application switching services to the Client Access Server and Edge Transport roles (the Hub Transport Server and Mailbox Server roles cannot benefit from network-based load balancing), including load balancing with persistence, SSL offload, and application health monitoring (Table 2).

Figure 2. Cisco Application Networking for Exchange Server Architecture



Virtualization within Cisco ACE allows a single active-active pair of Cisco ACE products to provide services for both Exchange Server and Office Communications Server 2007 as well as for other Microsoft and non-Microsoft enterprise applications. Further, if Cisco ACE is already deployed in the data center, virtualized contexts can be added to accommodate new Microsoft applications without the need to order and configure additional equipment.

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. Cisco ACE comes prepackaged with a number of predefined roles, and others can be customized as needed.

Table 2. Services Offloaded from Servers by the Solution

Microsoft Exchange Server Role	Site Load Balancing	Server Load Balancing
Client Access server	Cisco ACE GSS or DNS round-robin	Cisco ACE, Microsoft Network Load Balancing (NLB), or DNS round-robin
Hub Transport server	–	Handled internally by Microsoft Exchange Server
Mailbox server	–	–
Edge Transport server	Cisco ACE GSS or DNS round-robin	Cisco ACE, Microsoft NLB or DNS round-robin

Cisco Application Networking with Microsoft Office Communications Server 2007

This solution provides reference architectures and best practices for Cisco application networking solutions to optimize application availability and security of Office Communications Server 2007 deployments.

Cisco application networking solution configurations for Office Communications Server 2007 Consolidated and Expanded Deployments are documented, and server load balancing and firewalling of Office Communications Server 2007 components are explored: instant messaging, voice over IP (VoIP), presence, and web, audio and video conferencing (Figure 3). Multiple data centers deployment architectures are not covered in this solution.

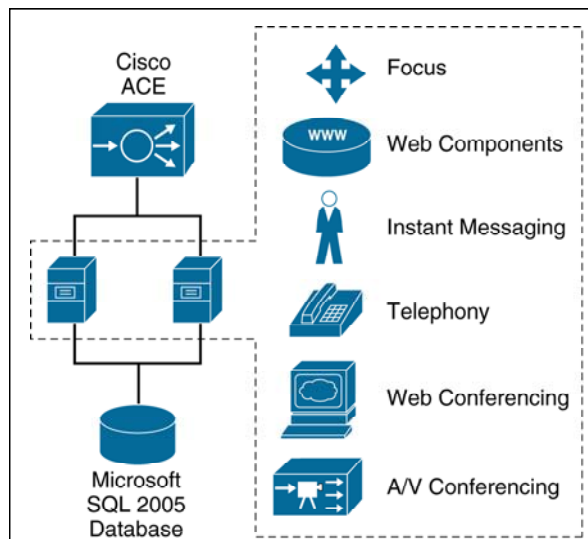
Because Office Communications Server 2007 includes multiple application protocols, including Session Initiation Protocol (SIP), HTTP, and HTTPS, traffic flows can be complex. This solution, together with Office Communications Server 2007 documentation, describes these traffic flows and protocols for client-to-server and server-to-server processes and recommends an approach to firewalling and load balancing traffic for optimized security and availability.

As for Exchange Server, this solution specifies where the application can benefit from Cisco ACE for intelligent load balancing of front-end servers and web component servers. Specific recommendations for the use of virtual IP addresses and source network address translation (NAT) can reduce deployment complexity.

Virtualization within Cisco ACE offers the same benefits as for Exchange Server. In this solution, virtualized Cisco ACE contexts are used to reduce necessary load balancing from two appliances to one, thus decreasing space, power, and cooling requirements. Further, Cisco ACE virtualization allows a single active-active pair of Cisco ACE solutions to serve both Exchange Server and Office Communications Server 2007 as well as other Microsoft and non-Microsoft enterprise applications.

This solution also documents how Cisco ACE provides health monitoring, probing the status of the Microsoft Office Communications Server front end (FE) servers. With full knowledge of server ports used for all Office Communications Server 2007 traffic flows, Cisco ACE and Catalyst 6500 Series FWSM use ACLs to protect servers from unwanted client or server traffic.

Cisco application networking solutions can be used with Office Communications Server 2007 to optimize deployments at large organizations with many thousands of users. A deployment with two Cisco ACE products and two Office Communications Server 2007 front end servers, could reasonably support up to 30,000 concurrent users and a much larger user population base. Further, this deployment can be scaled up to support even larger numbers of concurrent users and base population by introducing additional front end servers.

Figure 3. Cisco Application Networking for Office Communications Server 2007

Solution Deployment

Cisco ACE, Catalyst 6500 Series FWSM, and ACE GSS are arranged to provide virtualized application optimization services for multiple Microsoft application deployments as well as other enterprise applications. Because of their location in the data center in front of application servers, these solutions can take intelligent action on end-user traffic before it is routed to the application.

Recommended best practices and implementation guidance for Cisco Application Networking for Exchange Server and Office Communications Server 2007, including specific configurations for each Cisco network solution, can be found in the Cisco Application Networking for Exchange Server and Cisco Application Networking for Office Communications Server 2007 deployment guides at <http://www.cisco.com/go/optimizemicrosoft>.

The Cisco ACE and Catalyst 6500 Series FWSM solutions can be deployed in the data center as modules in the Cisco Catalyst 6500 Series Switches or as appliances. Any of these Cisco solutions can be deployed with either Exchange Server 2007 or Office Communications Server 2007.

Statement of Cooperation

Cisco and Microsoft cooperated in all phases of the Cisco Application Networking for Exchange Server 2007 and Office Communications Server 2007 testing, including lab setup at Cisco 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 More Information

- **Cisco Application Networking for Microsoft solutions:**
<http://www.cisco.com/go/optimizemicrosoft>
- **Cisco Application Networking Services (ANS):**
<http://www.cisco.com/go/applicationservices>
- **Cisco Application Networking partner portal:** <http://www.cisco.com/go/optimizemyapp>
- **Cisco ACE product information:** <http://www.cisco.com/go/ace>
- **Cisco Catalyst 6500 Series FWSM product information:** <http://www.cisco.com/go/fwsm>
- **Cisco ACE GSS product information:** <http://www.cisco.com/go/gss>
- **Microsoft Communications Server 2007 solutions:** <http://www.microsoft.com/uc>
- **Microsoft Exchange Server:** <http://www.microsoft.com/exchange>



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