

## Cisco Wide Area Application Services (WAAS) Version 4.0

Cisco® Wide Area Application Services (WAAS) is a powerful application acceleration and WAN optimization solution that accelerates the performance of any TCP-based application delivered across a WAN. Deployed as appliances or network modules integrated with the branch router, Cisco WAAS allows customers to consolidate costly branch servers and storage into data centers and deploy new applications centrally while still offering near-LAN performance for remote users. Cisco WAAS offers the lowest total cost of ownership (TCO) for branch-office and data center deployments, ease of integration through network transparency, reliable voice and data interoperability, and maximized overall security.

### Product Overview

Cisco WAAS accelerates application delivery to branch offices and solves the following IT challenges:

- Overcoming poor application performance over the WAN.
- Consolidating branch-office IT infrastructure into data centers while ensuring near-LAN application performance over the WAN.
- Controlling continuous growth in bandwidth requirements.
- Improving data protection, backup, and replication for remote offices and between data centers.
- By accelerating the performance of any TCP-based application over the WAN, Cisco WAAS offers the following benefits:
  - Cost savings through consolidation of branch-office infrastructure in data centers.
  - Increased employee productivity by providing near-LAN performance for all enterprise applications.
  - Improved data protection and regulatory compliance by eliminating the need for less secure tape-based backup at remote offices.

In addition to the benefits of WAN optimization described above, Cisco WAAS provides the lowest TCO solution, transparently preserves all existing network services, helps ensure reliable voice deployments and uniquely interoperates with Cisco firewalls to secure accelerated traffic.

### Lowest TCO for Branch Office and Data Center

Cisco WAAS provides the lowest TCO of any solution currently on the market by simplifying the IT application delivery architecture:

- The Cisco WAAS network module for the Cisco Integrated Services Router (ISR) reduces operating costs by up to 70% compared to other solutions by minimizing number of branch-office devices, leveraging the router support costs and simplifying management.
- Cisco WAAS enables consolidation of the largest number of branch services. In addition to file, application, storage and backup infrastructure, Cisco WAAS uniquely helps consolidate print and software distribution infrastructure in the data center.

- Cisco WAAS minimizes the number of servers required in the consolidated data center. By reducing the load on centralized file servers by up to 90 percent, Cisco WAAS helps reduce power, cooling, and space consumption in the data center.

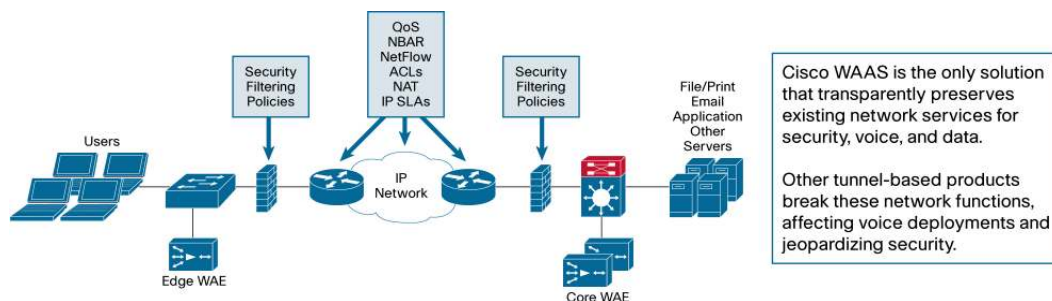
### Reliable Voice and Data Interoperability

Cisco WAAS uniquely integrates with Cisco IOS® Quality of Service (QoS) architecture to help ensure reliable deployment of voice over IP (VoIP) in the enterprise. Cisco IOS QoS deployed at the WAN edge dynamically adapts to changing WAN conditions, leverages visibility into WAN and LAN traffic, and offers extensive QoS mechanisms for reliable voice delivery. Unlike solutions that implement limited LAN-only QoS on the WAN optimization device and require multiple sets of policies to be independently managed, Cisco WAAS in combination with Cisco IOS QoS provides a unified VoIP framework.

### Ease of Integration Through Network Transparency

Cisco WAAS is built with a unique network-transparent architecture (Figure 1). Network transparency and preservation of IP and TCP header information is mandatory for interoperability with network services such as QoS, Cisco IOS NetFlow, access control lists (ACLs), firewalls, Cisco Optimized Edge Routing, and IP service-level agreements (SLAs). Other WAN optimization products hide accelerated traffic in opaque tunnels that break these network services, compromising the reliable operation of voice, data, and security in the network.

**Figure 1.** Cisco WAAS Network Transparency



### Secure WAN Acceleration

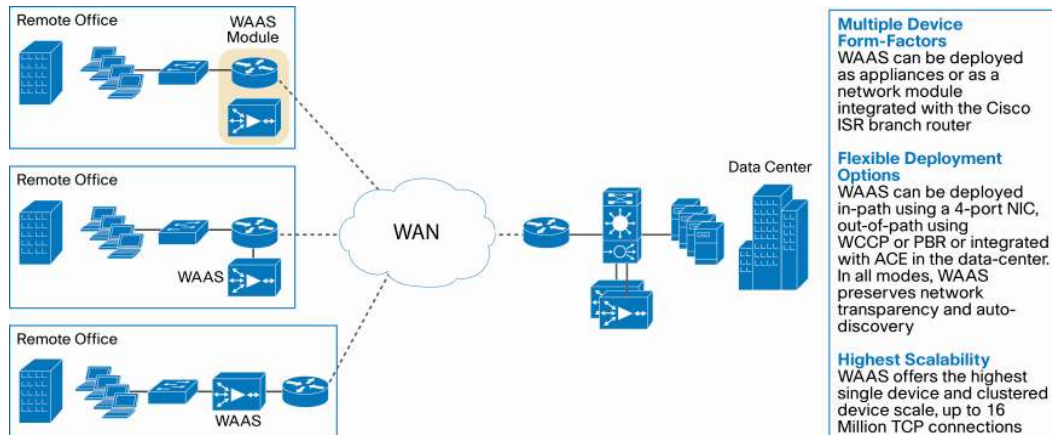
Cisco offers the only WAN Optimization solution that does not compromise enterprise security.

- Cisco provides the industry's first solution for securing accelerated traffic. Cisco WAAS deployed with Cisco firewalls (Cisco IOS, PIX, ASA and FWSM firewalls) provides stateful firewall inspection and network virus scanning of accelerated traffic. Other tunnel-based products invalidate firewall functions such as ACLs and stateful inspection, exposing enterprises to malicious attacks.
- Data at rest on the Cisco WAAS devices is secured using Federal Information Processing Standards (FIPS) based, 256-bit Advanced Encryption Standard (AES) disk encryption to secure data even in the event of physical compromise.
- Cisco WAAS offers unique role-based access control (RBAC) to limit administrative users to specific capabilities and domains of management, preventing even accidental compromise.

## Flexible, Scalable Deployment

Cisco WAAS provides the most flexible and scalable deployment options (Figure 2.)

**Figure 2.** Cisco WAAS Deployment



## Cisco WAAS 4.0 Features

**Table 1.** Main Features and Benefits of Cisco WAAS

Benefits	Feature Description
<b>WAN Optimization</b>	<ul style="list-style-type: none"> <li>• Transport Flow Optimization (TFO): TFO shields applications from unfavorable WAN conditions by providing slow-start mitigation using large initial windows, virtual window scaling beyond standard TCP window sizes, enhanced packet loss handling, and fairness towards all connections.</li> <li>• Data Redundancy Elimination (DRE): DRE is an advanced form of network compression that uses a bidirectional database to store previously seen TCP traffic and replace redundant patterns with very small signatures. DRE can provide up to 100:1 compression depending on the data being examined.</li> <li>• Adaptive Persistent Session-Based Compression can provide up to an additional 5:1 compression.</li> </ul>
<b>Application Acceleration</b>	<ul style="list-style-type: none"> <li>• CIFS data and metadata caching: Files accessed by branch users are temporarily stored in the remote WAE. Unchanged files are safely served from the cache without compromising data integrity.</li> <li>• Improved version control and collaboration: The file server or NAS device always has the authoritative copy of the files that are being accessed, eliminating version-control concerns.</li> <li>• Protocol acceleration: Application-specific latency is minimized through application-layer read-ahead, operation prediction, message multiplexing, pipelining, and parallelization.</li> <li>• Pass-through authentication, authorization, and locking: WAAS provides integration with Microsoft Active Directory, supports Windows NT LAN Manager, Kerberos authentication for CIFS.</li> <li>• Content pre-positioning: Centralized policy-based file distribution and pre-positioning can be used to push files to edge WAE devices, accelerating software patch distribution and file access for all users.</li> </ul>
<b>Branch Server Consolidation</b>	<ul style="list-style-type: none"> <li>• Cisco WAAS WAN optimization and application acceleration: These features provide near-LAN performance for applications over the WAN, enabling IT consolidation of branch-office infrastructure in the data center, including file, Web, e-mail, database, application, backup, and print servers.</li> <li>• In addition to local file services, WAAS' Windows-compatible print services help keep print traffic off the WAN. Server consolidation with WAAS offloads the data center servers by up to 90 percent.</li> </ul>
<b>Transparent Integration</b>	<ul style="list-style-type: none"> <li>• Network transparency: WAAS preserves all existing network services through network transparency.</li> <li>• Client, server, application transparency: No modifications to clients, servers or applications needed.</li> <li>• Automatic peer discovery: WAAS devices automatically discover peers, minimizing configuration.</li> </ul>

<b>Simplified Central Management and Monitoring</b>	<ul style="list-style-type: none"> <li>• Cisco WAAS Central Manager: This tool manages central configuration, provisioning, monitoring, fault-management, logging, and reporting for up to 2500 WAEs within a Cisco WAAS topology</li> <li>• Comprehensive statistics: Comprehensive logs, reports, graphs, and statistics for Cisco WAE device functions help IT administrators to optimize system performance and troubleshooting.</li> <li>• Monitoring, reporting, traps, and alerts: Simple Network Management Protocol (SNMP) Versions 2c and 3, Simple Mail Transport Protocol (SMTP), authenticating SMTP, and syslog are supported.</li> <li>• Centralized software upgrades: Administrators can remotely schedule upgrades or version rollbacks.</li> <li>• Application performance management: NetQoS SuperAgent and Cisco WAAS together uniquely provide accurate reports on end-to-end application performance and WAN bandwidth usage.</li> </ul>
<b>Scalability and High Availability</b>	<ul style="list-style-type: none"> <li>• Out-of-Path Deployment: WAAS can be deployed using WCCP v2 for high-availability clustering and N+1 load balancing for up to 32 Cisco WAE devices within a WCCPv2 service group. PBR is also supported as a deployment mechanism.</li> <li>• Physical inline interception: WAE devices can be transparently deployed using a 4-port NIC with the capability to fail-to-wire in the event of failure, helping ensure that network connectivity is not lost. The in-line option provides high scalability and active-active failover through daisy-chain clustering,</li> <li>• Cisco ACE: Cisco WAAS deployed with Cisco ACE can scale up to 16 million TCP connections and up to 64 GBps of bandwidth, supporting the largest possible deployments.</li> <li>• Configuration backup and restore: In the even of hardware failure, the reprovisioning and restore process can be handled remotely using the Cisco WAAS Central Manager.</li> <li>• Redundant WAN link support: WAAS supports environments with redundant WAN links, redundant routers, and asymmetric routing to improve high availability and optimization efficiency.</li> <li>• Offline file access support: Cisco WAAS supports Microsoft Windows offline folders and an optional read-only disconnected mode of operation to provide data access when the WAN is disconnected.</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Disk encryption: All data on the WAE is secured with 256-bit AES encryption and automatic key management.</li> <li>• Data access security: All security-related protocol commands are delegated to the file server and the domain controller. No additional domain security or user configuration is necessary.</li> <li>• Management access security: The Cisco WAAS Central Manager offers authentication, authorization, and accounting (AAA) integration with external authentication providers such as Microsoft Active Directory, RADIUS, and TACACS+ and supports RBAC to help ensure security.</li> <li>• Network security: Cisco WAAS and Cisco firewalls secure accelerated traffic with stateful firewall inspection and network virus scanning using Cisco IOS IPS. No other vendor preserves security for accelerated traffic.</li> </ul>

## Licensing Information

Cisco WAAS offers the following licenses based on feature capabilities:

- **Transport license:** The Cisco WAAS Transport license provides the WAN optimization features of Cisco WAAS including DRE, Lempel-Ziv (LZ) Compression, and TFO, optimizing application delivery to the branch office.
- **Enterprise license:** The Cisco WAAS Enterprise license provides Transport license functions plus application-specific accelerations, CIFS services, and print services to facilitate application acceleration, WAN optimization, and IT consolidation.
- **Central Manager License:** The Cisco WAAS Central Manager license enables a Cisco WAE device to be configured as a Central Manager for a Cisco WAAS deployment.

## Ordering Information

Table 2 provides ordering information for Cisco WAAS.

**Table 2.** Ordering Information for Cisco WAAS Software Options

Product Description	Part Number
Cisco WAAS 4.0 SW image (separate license required) for WAE-512	SF-WAAS-4.0-SA-K9
Cisco WAAS 4.0 SW image (separate license required) for WAE-612	SF-WAAS-4.0-SS-K9
Cisco WAAS 4.0 SW image (separate license required) for WAE-7326	SF-WAAS-4.0-SC-K9
Cisco WAAS 4.0 SW image (separate license required) for WAE-7341, WAE-7371	SF-WAAS-4.0-K9
Cisco WAAS Transport License for 1 WAE Appliance	WAAS-TRN-APL
Cisco WAAS Enterprise License for 1 WAE Appliance	WAAS-ENT-APL
Cisco WAAS Central Manager License (1 per mgmt appliance)	WAAS-CNTRL-MGR
WAAS Transport to WAAS Enterprise upgrade license for 1 WAE	WAAS-TRN2ENT-APL=
Cisco WAAS 4.0 NM SW image (separate license required)	SF-WAAS-4.0-NM-K9
Cisco WAAS Transport License for 1 Network Module	WAAS-TRN-NM
Cisco WAAS Enterprise License for 1 Network Module	WAAS-ENT-NM
Cisco WAAS Enterprise License for 1 Network Module (Upgrade from Transport)	WAAS-ENT-NM=
Cisco WAAS Enterprise License for 1 Network Module (sold with ISR bundle)	WAAS-ENT-NM-BUN

**Note:** All Cisco WAAS software options must be ordered with a corresponding Cisco WAE appliance or network module platform.

## WCCP Support

WCCP is a free software feature in Cisco IOS Software that runs on the following Cisco platforms: Cisco routers such as the Cisco 1800, 2800, and 3800 Series ISR; Cisco 3700, and 7000 families; and Cisco switches such as the Cisco Catalyst® 4500, 4900, and 6500 Series Switches.

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, see Cisco Technical Support Services or Cisco Advanced Services.

## For More Information

For more information about Cisco WAAS 4.0, visit <http://www.cisco.com/go/waas> or contact your local account representative.

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