Cisco Wide Area Application Services Software Version 4.2

Product Overview

Cisco® Wide Area Application Services (WAAS) is a comprehensive WAN optimization and application acceleration solution. Cisco WAAS accelerates applications and data over the WAN, optimizes bandwidth, empowers cloud computing, and provides local hosting of branch IT services, all with industry-leading network integration. As a crucial component of Cisco Borderless Networks and data center and virtualization architectures, Cisco WAAS allows IT departments to centralize applications and storage while maintaining productivity for branch-office and mobile users.

Cisco WAAS enables organizations to accomplish these primary IT objectives:

- Consolidate data centers
- Optimize branch-office sites with reduced network and IT infrastructure
- Manage bandwidth expenses
- Deliver desktop virtualization and rich-media applications
- Deliver high-performance cloud computing and software-as-a-service (SaaS) applications

Main Features

Cisco WAAS Software Version 4.2 provides these main features:

- Cisco WAAS for Cisco Integrated Service Routers Generation 2 (ISR G2) on Cisco Service-Ready Engine (SRE) Modules.
  - Cisco WAAS software can be provisioned as an application service on Cisco SRE 700 and 900 Service Modules (SMs) on the Cisco ISR G2 platforms.
  - Cisco SRE deployment enables remote activation of WAN optimization and eliminates the need for service calls and on-site installation.
- Enhanced HTTP application optimizer.
  - Improve HTTP response time, reduce HTTP server load, and reduce WAN bandwidth consumption.
- Expanded Windows-on-WAAS capabilities.
  - Cisco WAAS Software Version 4.2 has received Microsoft Windows Server Virtualization Validation Program (SVVP) validation for Windows 2008 and Windows 2008 Release 2 (R2).
  - Most Microsoft Windows services and applications can be hosted on Cisco WAAS as virtual blades.
  - The Microsoft Windows applications hosted on Cisco WAAS have higher performance due to multiprocessing and high network throughput.
  - Windows applications can be remotely installed on Cisco WAAS virtual blades using the preboot execution environment (PXE).
- Serial inline cluster for data centers.
  - Two Cisco WAAS appliances can be deployed inline in a serial manner using inline cards.
  - Up to four inline groups are supported on Cisco WAE-674, Cisco WAE-7341 and Cisco WAE-7371, by using two inline cards.
  - Enable high availability and redundancy for Cisco WAAS appliances in data centers.

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- Integrated Cisco WAAS configuration on Cisco ISR.
  - Enable single-screen configuration of Cisco WAAS Network Modules (NMEs) and Cisco WAAS SRE Modules using Cisco Configuration Professional or the Cisco IOS® Software command-line interface (CLI).
  - Provide proactive setup diagnostics.
  - Quicken and simplify Cisco WAAS NME and Cisco WAAS on Cisco SRE Module setup.
- SaaS optimization.
  - Optimize SaaS traffic with HTTP and HTTPS acceleration.
  - Automatically adapt to private and public cloud server IP address changes and make the change transparent to IT administrators.
  - Cisco now offers an end-to-end Cisco WebEx™ optimization solution that consists of a WebEx® node on Cisco ASR Aggregation Services Routers and Cisco WAAS.
- Common Criteria EAL-4 certification.
  - Cisco WAAS Software 4.2 has received Common Criteria EAL-4 certification.
  - The certification is recognition that the security of Cisco WAAS is designed and implemented in a rigorous manner that conforms to the standards of the security industry.

Main Differentiators

Cisco WAAS offers numerous benefits that distinguish it from other WAN optimization products.

Application-Vendor Validation

Cisco WAAS is the only WAN optimization solution that has jointly published validated designs with major application vendors such as Oracle, SAP, Microsoft, and IBM. They offer best practices and significantly reduce the risk of deploying WAN optimization to accelerate these applications.

- With Microsoft, Cisco has developed the optimized branch-office architecture through which Cisco WAAS is used to optimize performance of centralized applications such as Microsoft Exchange, SharePoint, and file services, while Microsoft Windows core services such as Microsoft Active Directory and print services are integrated into branch-office Cisco WAAS devices using Cisco WAAS virtual blades for local hosting. The Cisco WAAS optimization for Microsoft Windows protocols has been developed with Microsoft, and the relevant intellectual property rights (IPRs) are licensed from Microsoft.
- Cisco offers joint escalation support with some major application and storage vendors to help ensure that cross-vendor concerns are appropriately addressed.

Network Integration

Cisco WAAS transparent architecture (Figure 1) enables integration into the network and preservation of existing network services, thereby making WAN acceleration easy to deploy and operate.

- Network transparency and preservation of IP and TCP header information allows ease of operation and interoperability with network services such as quality of service (QoS), NetFlow, access control lists (ACLs), firewalls, Cisco Performance Routing (PfR), and IP service-level agreements (SLAs).
- Cisco WAAS offers automatic discovery of optimization devices, simplifying operations for all types of WAN architectures (including Multiprotocol Label Switching [MPLS], hierarchical networks, and hub-and-spoke topologies).
- Cisco WAAS integrates with all the Cisco firewalls - Cisco IOS Firewall, PIX® Firewall Software, ASA 5500 Series Enterprise Firewall Edition, and Catalyst® 6500 Series Firewall Services Module (FWSM) - to provide

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the only solution in the industry that gives customers full stateful firewall inspection and network virus-scanning capabilities for accelerated traffic.

- For inline deployments, Cisco WAAS offers a low-latency voice-over-IP (VoIP) traffic bypass feature that has been stress tested with Cisco VoIP test beds.

Low Total Cost of Ownership

Cisco WAAS is cost effective and provides the lowest total cost of ownership (TCO) of any solution currently on the market.

- By integrating Cisco WAAS into network modules or Cisco SRE Modules on Cisco ISR, Cisco WAAS reduces capital expenditures (CapEx), operating expenses (OpEx), and support costs. By reducing the number of branch-office devices needed, Cisco WAAS decreases OpEx by up to 70 percent.
- Cisco WAAS virtual blades provide local hosting with centralized deployment for Microsoft Windows and Linux branch-office services while reducing the branch-office device footprint.
- Cisco WAAS eliminates the need for WAN bandwidth upgrades and complex configuration for wide-scale delivery of live video to the branch office.

Deployment Options

Cisco WAAS provides flexible deployment options, as shown in Figure 1 and summarized in Table 1.

Figure 1. Cisco WAAS Deployment Options for Branch-Office and Mobile Employees

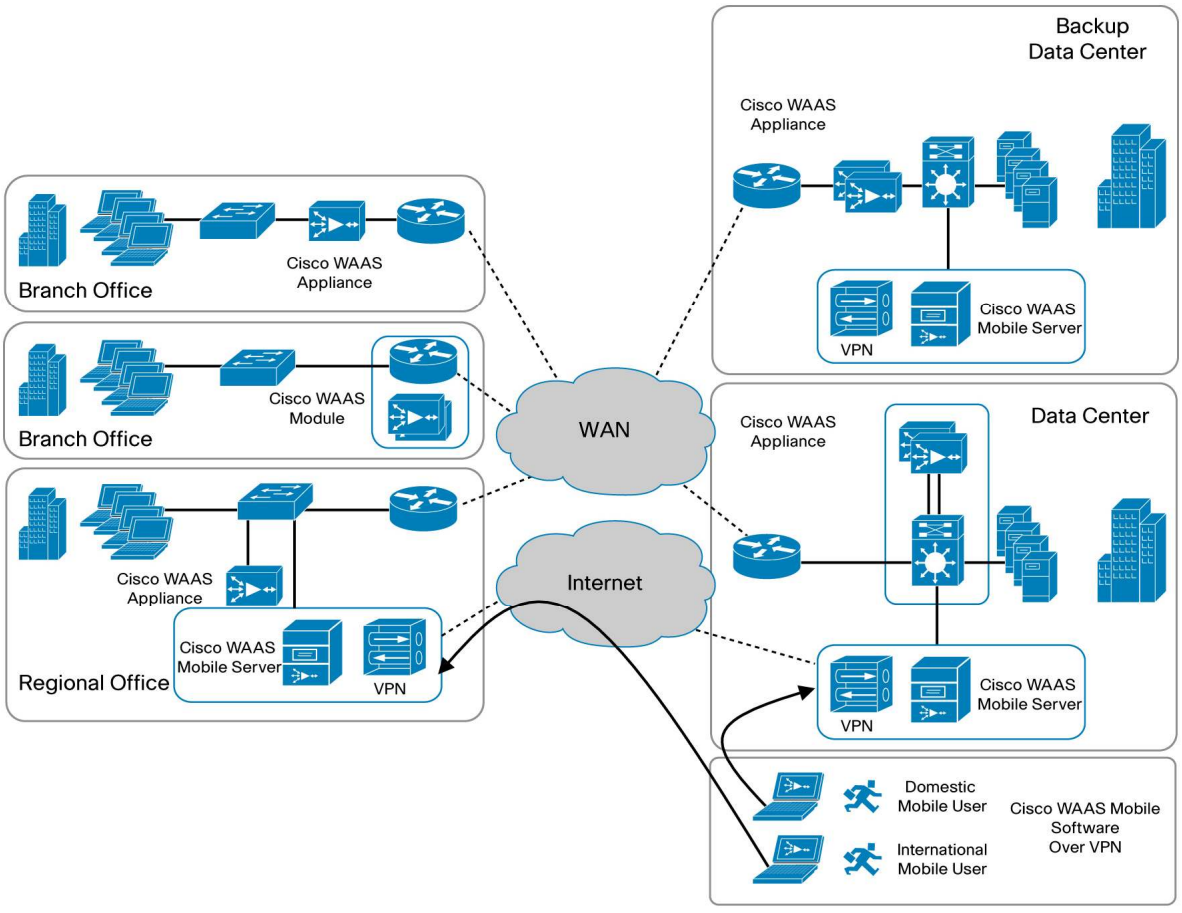

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Table 1. Cisco WAAS Flexible Deployment Options

Deployment Location	Cisco WAAS			
	Cisco WAAS Appliances	Cisco WAAS Modules on Cisco ISR and ISR G2	Mobile Client	Mobile Server
Branch office	Yes	Yes	-	-
Data center	Yes	-	-	Yes
Mobile or home-office PCs	-	-	Yes	-

Features and Benefits

Table 2 summarizes the main features and benefits of Cisco WAAS. For detailed information about acceleration for mobile users, please refer to the Cisco WAAS Mobile data sheet.

Table 2. Main Benefits and Features of Cisco WAAS

Benefit	Feature
WAN Optimization • Eliminate or defer expensive WAN bandwidth upgrades	• **Transport Flow Optimization (TFO):** TFO improves application packet flow under unfavorable WAN conditions such as packet loss and small initial windows while helping ensure fairness. • **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. • **Adaptive Persistent Session-Based Compression:** This type of compression can provide up to an additional 5:1 compression.
Application Acceleration • Improve employee productivity • Consolidate branch-office servers • Centralize branch-office IT resources such as storage and backup tapes and reduce operating costs	• **Protocol acceleration:** Application-specific latency is reduced through a variety of application-layer techniques such as read-ahead, operation prediction, connection reuse, message multiplexing, pipelining, and parallelization, resulting in LAN-like performance despite deployment over a WAN. • **Application optimizers:** Protocol-specific acceleration is available for Microsoft Windows file sharing (Common Internet File System [CIFS]); Microsoft Exchange (MAPI and MAPI over SSL); HTTP and HTTPS applications such as Oracle, SAP, and Microsoft SharePoint and OWA; Microsoft Windows print services; and UNIX NFS. These features improve end-user application response time, significantly improving employee productivity. • **Content prepositioning:** Centralized policy-based file distribution and prepositioning can be used to push files to edge Cisco WAAS devices, accelerating software patch distribution and file access for all users.
Ease of Initial and Ongoing Deployment	• **Network transparency:** Cisco WAAS preserves all existing network services. • **Client, server, and application transparency:** No modifications to clients, servers, or applications are needed. • **Automatic peer discovery:** Cisco WAAS devices automatically discover peers, reducing configuration steps. • **Quickstart wizard:** Use of the wizard eliminates many configuration steps. The wizard includes defaults for faster deployment. • **Management and monitoring:** Intuitive workflow-based management and real-time monitoring are provided. Diagnostic and troubleshooting tools help reduce mean time to resolution.
Delivery of High-Quality Live and On-Demand Video • Eliminate need for expensive WAN bandwidth upgrades • Avoid complex configuration • Centralize branch video servers	• **Easy-to-deploy live video with edge-stream splitting:** Automated edge-stream splitting helps ensure that only one video stream is downloaded over the WAN regardless of the number of users in the branch office viewing that stream. • **Recorded video on demand (VoD):** VoD files can be published using prepositioning on edge Cisco WAAS devices. • **Server offload:** The live and on-demand video features offer server offload capability that can enable up to 10X reduction in the number of data center video servers.
Locally Hosted Branch-Office IT Services • Reduce branch-office device footprint • Deploy branch-office IT services with flexibility and agility	• **Network-embedded virtualization:** Third-party services can be hosted on isolated virtual blades. This architecture maintains native performance for WAN optimization, while using the same hardware platform for additional hosted services. • **Virtual blades:** This feature can be used to deploy many different Microsoft Windows and Linux branch-office services on Cisco WAAS appliances within hours instead of the days or weeks often required for dedicated hardware-based deployments. Certified and supported hosted services includes Microsoft Active Directory, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), and print services using Microsoft Windows Server 2003, 2008, or 2008R2; Cisco Network Analysis Module (NAM); and Cisco Application and Content Network System (ACNS).

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Benefit	Feature
Simplified Central Management and Monitoring • Enhance usability with intuitive workflow-based management tools • Enhance visibility through real-time monitoring of connections with application performance management	• **Cisco WAAS Central Manager:** This workflow-based tool manages central configuration, provisioning, real-time monitoring, fault management, logging, and customized reporting with the capability to create scheduled reports for up to 2500 Cisco WAAS devices within a Cisco WAAS topology. • **Comprehensive statistics:** Comprehensive logs, reports, graphs, and statistics for Cisco WAE device functions help IT administrators optimize system performance and troubleshooting. • **Monitoring, reporting, traps, and alerts:** Real-time monitoring of connections, Simple Network Management Protocol (SNMP) Versions 2c and 3, Simple Mail Transport Protocol (SMTP) authentication, and syslog are supported. • **Centralized software upgrades:** Administrators can remotely schedule upgrades or version rollbacks. • **Application performance management:** NetQoS SuperAgent and Cisco WAAS together uniquely provide accurate reports on end-to-end application response time and WAN bandwidth utilization. • **Easy integration with software distribution tools:** Tools include Short Message Service (SMS), LANDesk, Altiris, and BigFix solutions. • **XML API:** The XML API can be used to integrate Cisco WAAS Central Manager into customers' network management and monitoring systems.
Scalability and High Availability	• **Out-of-path deployment:** Cisco WAAS can be deployed using WCCPv2 for high-availability clustering and N+1 load balancing for up to 32 Cisco WAAS devices within a WCCPv2 service group. Policy-based routing (PBR) is also supported as a deployment mechanism. • **Physical inline interception:** Cisco WAAS appliances can be transparently deployed using a four-port network interface card (NIC) with fail-to-wire capability in the event of failure, helping ensure that network connectivity is not lost. The inline option provides high scalability and active-active failover through daisy-chain clustering. • **Cisco ACE Application Control Engine:** Cisco WAAS deployed with Cisco ACE can scale up to 16 million TCP connections and up to 64 Gbps of bandwidth, supporting the largest deployments. • **Configuration backup and restore:** In the event of hardware failure, the reprovisioning and restore process can be handled remotely using the Cisco WAAS Central Manager. • **Redundant WAN link support:** Cisco WAAS supports environments with redundant WAN links, redundant routers, and asymmetric routing to improve high availability and optimization efficiency.
Security	• **Data-at-rest encryption:** All data on the Cisco WAAS disk is secured with 256-bit AES encryption and automatic key management. • **Data-in-flight security:** Cisco firewalls perform stateful inspection of accelerated traffic. • **Acceleration of SSL applications**: Existing enterprise security architecture is preserved when accelerating SSL applications. • **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. • **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. • **Network security:** Cisco WAAS and Cisco firewalls secure accelerated traffic with stateful firewall inspection and network virus scanning using Cisco IOS Intrusion Prevention System (IPS). No other vendor preserves security for accelerated traffic

Licensing

Cisco WAAS offers the following licenses based on feature capabilities:

- Cisco WAAS Transport license: This license provides the WAN optimization features of Cisco WAAS, including DRE, Lempel-Ziv (LZ) compression, and TFO, optimizing application delivery to the branch office.
- Cisco WAAS Enterprise license: This license provides Transport license functions plus application-specific accelerations for protocols including CIFS, MAPI, HTTP, SSL, NFS, and Microsoft Windows print services, to facilitate application acceleration, WAN optimization, and IT consolidation.
- Cisco WAAS Live Video license: This add-on license provides wide-scale delivery of live video to the branch office across the WAN. It offers automated edge-stream splitting to help ensure that only one video stream is downloaded over the WAN regardless of the number of users in the branch office viewing that stream. This option is available only when the Cisco WAAS Enterprise license is ordered.
- Cisco WAAS Virtual Blade license: This add-on license enables local hosting of server OS and applications on Cisco WAAS appliances. This option is available only when the Cisco WAAS Enterprise license is ordered and is available for Cisco WAVE-274, Cisco WAVE-474, Cisco WAVE-574 and Cisco WAE-674 with Cisco WAAS Software Versions 4.1 and 4.2.
- Cisco WAAS Virtual Blade license with Microsoft Windows Server Core 2008: This add-on license offers organizations flexible delivery of branch-office IT services while reducing the device footprint. The first set of

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certified and supported hosted services includes Microsoft Windows Active Directory, DNS, DHCP, and print as part of the Microsoft Windows Server 2008 core services. This option is available only when the Cisco WAAS Enterprise license is ordered and is available for Cisco WAVE-274, Cisco WAVE-474, Cisco WAVE-574 and Cisco WAE-674 with Cisco WAAS Software Versions 4.1 and 4.2.

Ordering Information

For ordering information, please contact your local Cisco account representative.

Upgrade from Cisco WAAS Software Versions 4.0 and 4.1

Customers who have an active Software Application Support plus Upgrades (SASU) contract in place can upgrade from Cisco WAAS Software Version 4.0 or 4.1 to Version 4.2 with no additional cost.

WCCP Support

Web Cache Communication Protocol (WCCP) is a free Cisco IOS Software feature that runs on the following Cisco platforms:

- Cisco routers such as the Cisco 1800, 2800, and 3800 Series ISR; Cisco 1900, 2900, and 3900 Series ISR G2; Cisco 7000 Series; and Cisco ASR 1000 Series Routers.
- Cisco switches such as the Cisco Catalyst 4500 and 6500 Series Switches and Cisco Nexus® 7000 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 offerings 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 and Cisco Advanced Services.

For More Information

For more information about Cisco WAAS Software Version 4.2, visit http://www.cisco.com/go/waas or contact your local account representative.

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