Cisco Wide Area Application Services Software Version 4.3

Product Overview

Cisco® Wide Area Application Services (WAAS) is a comprehensive WAN optimization and application acceleration solution that is a key component of Cisco Borderless Networks and Data Center architectures.

Cisco WAAS accelerates applications and data over the WAN, optimizes bandwidth, empowers cloud services, 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 enables organizations to accomplish primary IT objectives across the Cisco solution areas:

- Data centers
  - Consolidate and virtualize data centers
  - Deliver desktop virtualization
  - Deploy new, rich-media applications
  - Deliver high-performance cloud services and software-as-a-service (SaaS) applications
- Borderless networks
  - Optimize branch-office sites with reduced network and IT infrastructure
  - Optimize bandwidth for rich media and telepresence
  - Defer bandwidth upgrade expenses
  - Protect remote data and help ensure business continuity for regulatory compliance

Main Features

Cisco WAAS Software Version 4.3 provides these main features and benefits:

- Cisco Virtual WAAS (vWAAS)
  - Cisco vWAAS is a virtual appliance that provides application acceleration and WAN optimization for any TCP-based application delivered from the cloud to end users in remote branch offices, campuses, and data centers, helping ensure an optimal end-user experience. It allows organizations to migrate their business application traffic to the cloud without affecting application performance.
  - Cisco vWAAS runs on the industry-leading VMware ESX and ESXi 4.0 hypervisor and Cisco Unified Computing System™ x86 servers, enabling an agile, elastic, and multi-tenant deployment in private and virtual private cloud infrastructure.
  - Cisco vWAAS is a cloud-ready WAN optimization service that can be deployed in an application-specific, virtualization-aware, and on-demand manner. Using policy-based configuration in the Cisco Nexus® 1000V Series Switches, Cisco vWAAS service is associated with application server virtual machines as they are instantiated or moved. This behavior enables cloud providers to offer rapid delivery of WAN optimization services with little network configuration or disruption in cloud-based environments.
  - Cisco vWAAS Central Manager provides common management of physical and Cisco vWAAS instances.

- Enhanced acceleration and optimization for secure web-based (HTTPS) applications
  - New optimization features improve application response time, reduce server load, and reduce WAN bandwidth consumption for secure web-based applications.
- Common Cisco WAAS Central Manager for Cisco WAAS Express instances
  - Enhanced Cisco WAAS Central Manager capabilities enable organizations to manage the industry's broadest portfolio of WAN optimization devices from any vendor. Cisco WAAS Central Manager can manage Cisco Wide Area Application Engine (WAE) and Wide Area Virtualization Engine (WAVE) appliances, Cisco Integrated Services Router (ISR) integrated network modules and Cisco Services-Ready Engine (SRE) Modules, Cisco vWAAS, and Cisco ISR Generation 2 (ISR G2) integrated Cisco WAAS Express in Cisco IOS® Software.
- Enhanced performance monitoring with new charts
  - Better throughput performance
  - Device connections scalability metrics
  - Exportable executive performance summary report

Unique Cisco WAAS Advantages

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

Cisco WAAS Offers the Most Choices for WAN Optimization with the Broadest Portfolio

- Software-based WAN optimization solutions
  - Cisco WAAS Software on Cisco ISR G2 provides router-integrated, on-demand WAN optimization for branch offices. The Cisco SRE Modules on the Cisco ISR G2 platform, which decouple software services from the underlying hardware, can deliver WAN optimization as an on-demand service as required by business objectives and IT budget. This approach makes better use of existing investments while offering business agility.
  - Cisco vWAAS is a virtual appliance that accelerates business applications delivered from private and virtual private cloud infrastructure, helping ensure an optimal user-experience. Cisco vWAAS enables cloud providers to rapidly create WAN optimization services with little network configuration or disruption in cloud-based environments by using policy-based configuration in the Cisco Nexus 1000V Series, which allows association with application server virtual machines as they are instantiated or moved.
  - Cisco WAAS Express extends the Cisco WAAS product portfolio with a small-footprint, cost-effective Cisco IOS Software solution integrated into Cisco ISR G2 to offer bandwidth optimization capabilities. Cisco WAAS Express increases remote user productivity, reduces WAN bandwidth costs, and offers investment protection by interoperating with existing Cisco WAAS infrastructure.
  - Cisco WAAS Mobile delivers bidirectional compression, application-specific accelerators, and flow optimizers for mobile or remote users in situations in which neither an appliance nor a branch router is available or practical, or for public cloud environments that cannot support an appliance.
- Full appliance portfolio
  - Branch-office appliances support Cisco WAAS virtual blades for local hosting of branch-office IT services, reducing branch footprint.
  - Scalable data center platforms support small to large data centers across a wide range of deployment scenarios and price points.

Cisco WAAS Offers a Proven End-to-End Architectural Approach with Validated Designs to Lower Cost of Ownership and Ease Deployment Challenges

Cisco WAAS is the only WAN optimization solution that has published jointly validated designs with major application vendors such as Oracle, SAP, Microsoft, and IBM. Validated designs assist Cisco customers by offering best practices to successfully incorporate IT infrastructure such as Cisco switches, routers, security devices, and servers, thus significantly reducing the risk of deploying WAN optimization to accelerate these applications. Coupled with award-winning Cisco global support and advanced services, Cisco WAAS gives customers a significant set of resources to help ensure full network integration while reducing maintenance costs and deployment time.

For example, with Microsoft, Cisco has developed an optimized branch-office architecture that uses Cisco WAAS to optimize performance of centralized applications such as Microsoft Exchange, SharePoint, and file services, while most Microsoft Windows branch-office services and applications can be locally hosted on Cisco WAAS devices using Cisco WAAS virtual blades. The Cisco WAAS optimization for Microsoft Windows protocols has been developed with Microsoft, and the relevant intellectual property rights (IPRs) are licensed from Microsoft.

Network Services Integration Provides Transparent, Secure, and Reliable Application Performance

Cisco WAAS transparent architecture 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, Cisco PIX® Firewall Software, Cisco ASA 5500 Series Enterprise Firewall Edition, and Cisco Catalyst® 6500 Series Firewall Services Module (FWSM) - to provide 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.

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
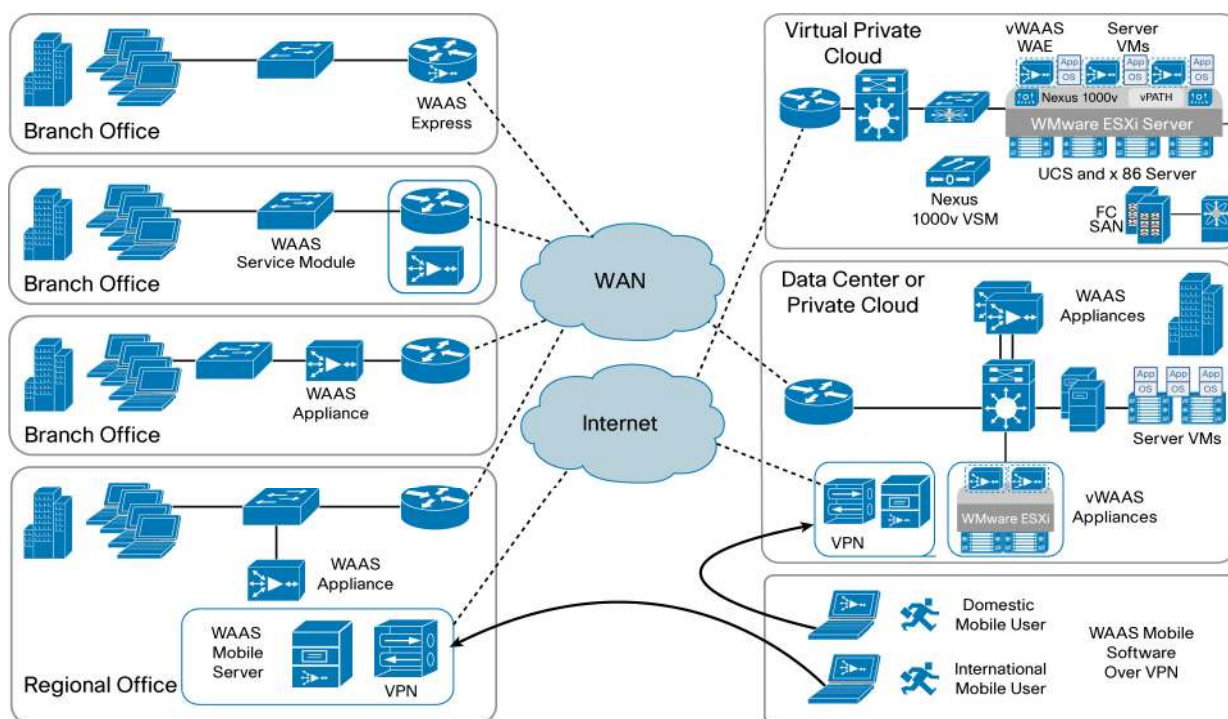
Table 1.   Cisco WAAS Flexible Deployment Options

Deployment Location	Cisco WAAS Product Family					
	Cisco WAAS Appliances	Cisco vWAAS	Cisco WAAS Modules on Cisco ISR and ISR G2	Cisco WAAS Express on ISR G2	Cisco WAAS Mobile Client	Cisco WAAS Mobile Server
Branch office	Yes	Yes	Yes	Yes	-	-
Data center	Yes	Yes	-	-	-	Yes
Private, virtual Private Cloud (vPC) and public cloud	Yes	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. For the features and benefits of Cisco WAAS Express, please refer to the Cisco WAAS Express data sheet.

Table 2.   Main Benefits and Features of Cisco WAAS and vWAAS

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.

Benefit	Feature
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 (Messaging API [MAPI] and MAPI over SSL); HTTP and HTTPS applications such as Oracle, SAP, and Microsoft SharePoint and Outlook Web Access (OWA); Microsoft Windows print services; and UNIX Network File System (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.
Flexible deployment options for cloud	**For private and virtual private cloud:** • **Agile:** Implement agile virtual machine-based deployments on standard x86 servers, such as Cisco UCS servers. • **Application-specific WAN optimization:** Use Cisco Nexus 1000V Series port profiles and vPath to create value-added WAN optimization services on a per-application basis in your catalog of cloud services (for example, use Cisco vWAAS only for Microsoft SharePoint or Exchange) for optimized delivery to remote branch-office users. • **Elastic scale-out Cisco WAAS deployment:** Using policy-based configuration in the Cisco Nexus 1000V Series Switch, you can associate Cisco vWAAS services with application server virtual machines as they are instantiated or moved in response to dynamic application load demand in the cloud. This capability enables cloud providers to offer rapid delivery of WAN optimization services with little network configuration or disruption to achieve a cloud consumption and delivery model. • **Multi-tenant:** Cisco vWAAS reduces the hardware footprint needed for multi-tenant deployments. • **DRE on SAN:** Cisco vWAAS offers an option to allow its DRE database to be hosted on the SAN to provide an improved fault-tolerant response and to support virtual machine mobility requirements. • **Validated sizing benchmarks on Cisco UCS servers:** Cisco vWAAS can be hosted on any x86 server that supports the VMware ESX and ESXi 4.0 hypervisor. Sizing benchmarks and performance metrics provided on the Cisco Unified Computing System platform result in lower risk for cloud deployments. **For public cloud:** • **Accelerate SaaS applications:** Cisco WAAS accelerates SaaS applications, such as Salesforce.com, delivered from the public SaaS cloud. SaaS applications are typically HTTPS based and can be configured in an easy and scalable manner. In addition, Cisco WAAS Mobile can be used to accelerate access to hosted IaaS applications delivered from the public cloud, such as Amazon.com, to remote mobile users. • **Cloud agnostic:** Cisco vWAAS can be deployed in public clouds with the Cisco Nexus 1000V Series to obtain benefits similar to those for private clouds. The Cisco vWAAS solution is public-cloud agnostic. **Note:** IaaS = Infrastructure as a Service; SaaS = Software as a Service
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 include 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).

Benefit	Feature
	Note: Because Cisco vWAAS is a virtual appliance, it does not support the virtual blades feature available on physical Cisco WAVE appliances.
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 about 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 Web Cache Communication Protocol Version 2 (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 Application Control Engine (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 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 Advanced Encryption Standard (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 role-based access control (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, WAVE-474, WAVE-574, and WAE-674 with Cisco WAAS Software Versions 4.1, 4.2, and 4.3.
- 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 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, WAVE-474, WAVE-574, and WAE-674 with Cisco WAAS Software Versions 4.1, 4.2, and 4.3.

Cisco vWAAS is offered only starting with Cisco WAAS Software Version 4.3.1 and supports only the Enterprise license option. For details about models, pricing, and sizing, please contact your local Cisco account representative.

Ordering Information

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

Upgrade from Cisco WAAS Software Versions 4.0, 4.1, and 4.2

Customers who have an active Software Application Support plus Upgrades (SASU) contract in place can upgrade from Cisco WAAS Software Version 4.0, 4.1, or 4.2 to Version 4.3 with no additional cost.

WCCP Support

Web Cache Communication Protocol, or 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 4.3, visit http://www.cisco.com/go/waas or contact your local account representative.

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