

## Cisco Wide Area Application Engine

The Cisco® Wide Area Application Engine (WAE) platforms are a portfolio of powerful, scalable network appliances that host WAN optimization and application acceleration solutions that enable branch office server consolidation, performance improvements for centralized applications, and provide remote users with LAN-like access to applications, storage and content across the WAN.

### Product Overview

Distributed organizations face significant challenges in the deployment, management, and protection of remote office infrastructure, while at the same time needing to deliver increasingly rich application content and services to remote users. While performance and scalability constraints imposed by the Wide Area Network (WAN) directly impact the ability of a remote worker to maintain productivity, there is a conflicting pressure to centralize distributed application and file services infrastructure into corporate data centers. Centralizing applications and services in the data center leverages available IT personnel and data protection infrastructure, enables collaborative applications, reduces costs and helps implement regulatory compliance requirements. Furthermore, enterprises are looking for ways to control the explosive growth in bandwidth requirements generated by new applications and business processes, while also improving throughput and responsiveness for existing applications in a transparent manner.

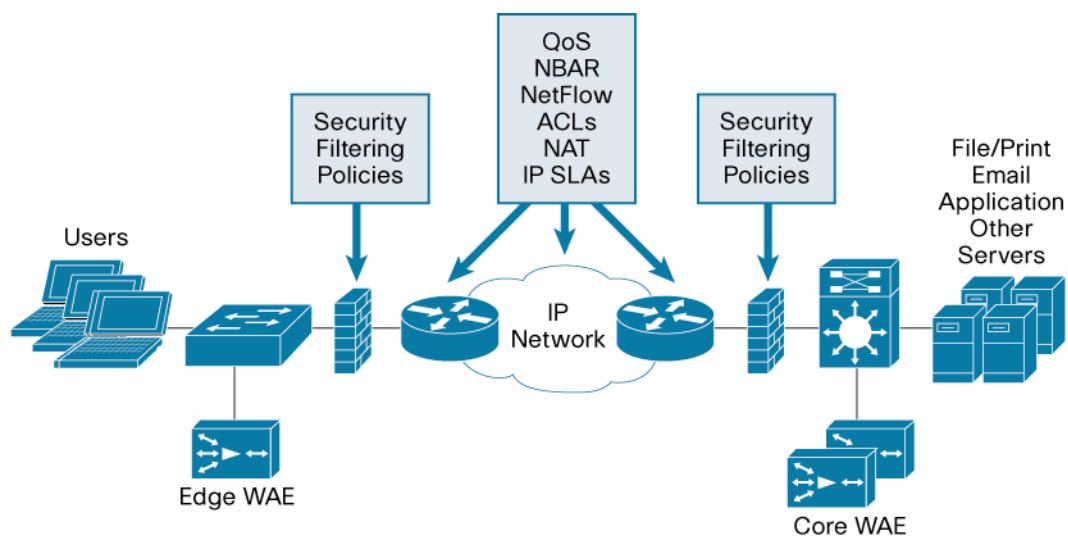
The Cisco WAE platforms offer a single unified platform to host WAN optimization and application acceleration products from Cisco Systems® including Cisco Wide Area Applications Services (WAAS) Software, Cisco Wide Area File Services (WAFS) Software and Cisco Application and Content Networking System (ACNS) Software that facilitate the consolidation of remote office application infrastructure and services in the data center while providing LAN-like service levels that remote users are accustomed to. The Cisco WAE platforms deployed with Cisco WAAS overcome the performance barriers created by the WAN through a sophisticated combination of application acceleration and WAN optimization techniques that mitigate application and transport latency, improve throughput, and minimize WAN bandwidth consumption for any TCP-based application. Deployment and management are simplified through the transparent integration of Cisco WAAS—both logically and physically—with the existing network, allowing preservation of existing network policies, automatic discovery across any network topology, and end-to-end application traffic visibility for ease of monitoring, control and troubleshooting. The result is a significantly lower total cost of ownership (TCO), greater application performance, more efficient WAN utilization and simplified data protection in an easy to implement package.

## Cisco WAE Appliances Deployed with Cisco WAAS

The Cisco WAE hardware provides customers with an enterprise class platform for hosting Cisco's WAN optimization solutions. Benefits of the Cisco WAAS solution deployed on Cisco WAEs include the following:

- **Cost savings through infrastructure consolidation:** Cisco WAAS helps organizations consolidate remote office server infrastructure in the data center, including file servers, web servers, email servers, application servers, and database servers. Consolidating server infrastructure minimizes deployment, operational and management costs, improves data availability and facilitates compliance with regulatory mandates.
- **Improved productivity through LAN-like performance:** Cisco WAAS incorporates application-specific acceleration as well as WAN optimization that enable near-LAN performance for accessing centralized applications over the WAN, increasing employee productivity and collaboration across all branch application services including web, file, video, email and enterprise applications.
- **Simplified data protection:** With Cisco WAAS IT organizations can apply standard backup, retention, storage management and recovery procedures while reducing the IT overhead required to support remote locations. Business continuity and disaster recovery policies can be maintained at considerably lower costs and risks than before.
- **Transparent integration:** Cisco WAAS integrates transparently with existing client, server, storage, and network infrastructure (Figure 1). Optimizations provided by Cisco WAAS are transparent and require no changes to the infrastructure. Unlike many WAN optimization products that use TCP encapsulation, Network Address Translation (NAT) static tunnels, or dynamic tunnels, the Cisco WAAS solution provides WAN optimization capabilities without manipulating information that is vital for enabling value-added services that are hosted within the network infrastructure. By providing packet network transparency and preserving IP and TCP header information, Cisco WAAS is able to interoperate with current and future Cisco IOS® Software deployments of advanced network services such as Quality of Service (QoS), NetFlow, Access Control Lists (ACLs), Optimized Edge Routing (OER), IP SLAs, Router and Link redundancy as well as other Cisco products like the PIX firewall.

**Figure 1.** Cisco WAAS Network Transparency



- **Ease of Deployment:** Cisco WAE devices offer a number of deployment methods including clustered in-line and out-of-band deployments to meet the varying needs and challenges of complex and very large network architectures.
  - **Redirection Based Interception:** Cisco WAE devices can also be deployed using Web Cache Coordination Protocol version 2 (WCCPv2), providing transparent network interception and redirection of packets, high availability clustering and load-sharing. Policy Based Routing (PBR) is another interception and redirection mechanism that can be employed to deploy Cisco WAAS in a high availability configuration with failover support.
  - **Physical Inline Deployment:** Cisco WAE devices can be transparently deployed in-line using an optional 4-port network interface card with the ability to fail-to-wire in the event of a software or hardware failure, preserving traffic flow in both directions and ensuring no loss of network connectivity. Cisco WAE devices deployed using the in-line option provide high scalability and active-active failover through daisy-chain clustering.
- **Designed for the Enterprise:** Cisco WAAS and Cisco WAE are designed based on the experience gathered from thousands of enterprise deployments to be part of an extensible architecture for the branch office. They are highly synergistic with existing hardware, software and administrative procedures to ensure minimal disruption and accelerated time to deployment, while transparently preserving network policies such as NetFlow, QoS classification, prioritization, queueing, shaping, policing, ACLs, load balancing and high availability.

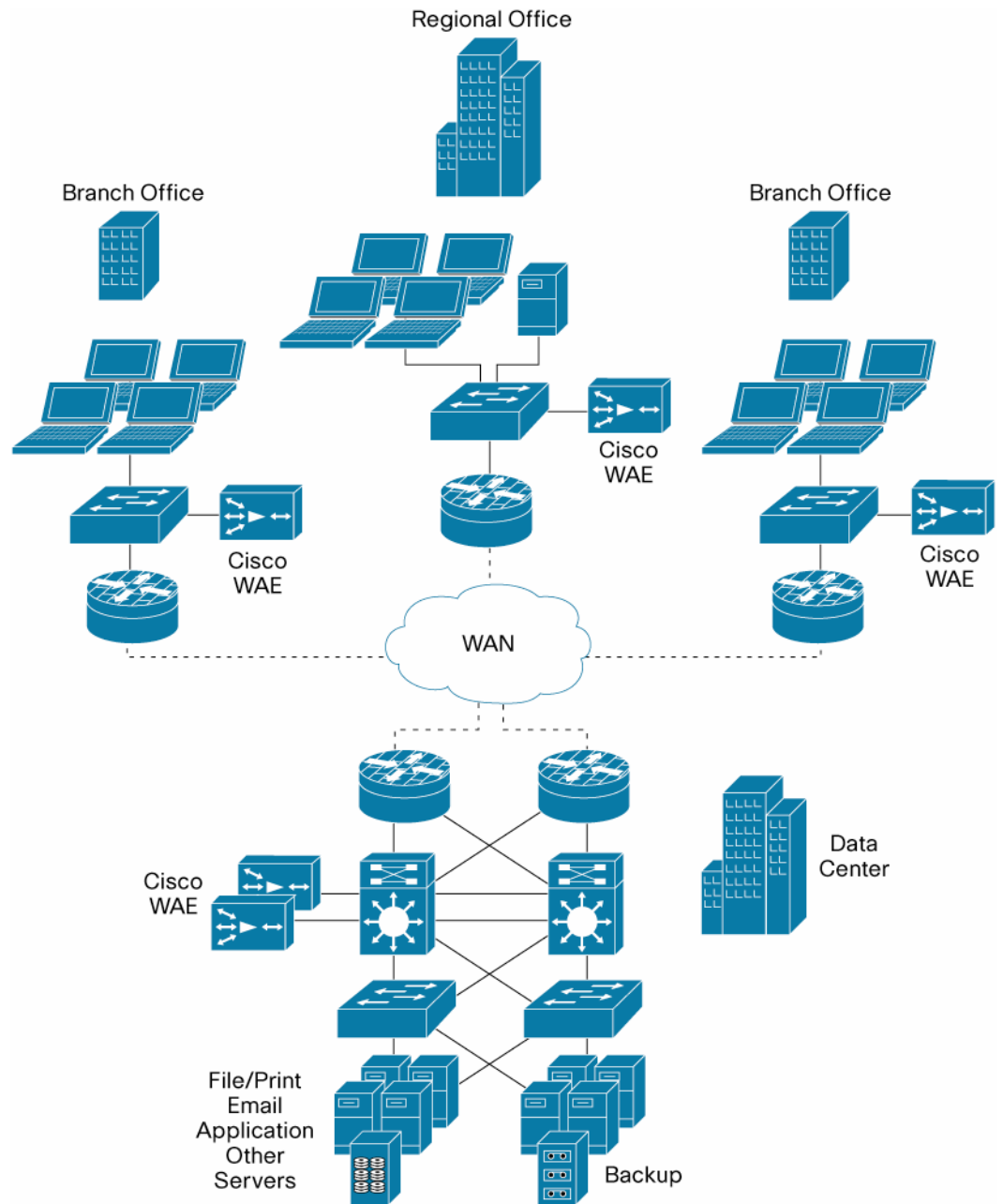
#### **Cisco WAE Appliances Deployed with Cisco ACNS**

When deployed with Cisco ACNS software, Cisco WAE Appliances address the need to distribute and receive high-bandwidth, media-rich content across the Internet or an intranet without performance losses or content-delivery delays. With Cisco ACNS Software installed, the Cisco WAE Appliance helps organizations accelerate video-streaming solutions deployed at remote branches and helps customers manage content caching and distribution.

### Product Line

The Cisco WAE Appliances product line includes three network appliances that address varying customer needs based on branch size, bandwidth availability, and usage patterns and are designed to scale to very large enterprise wide deployments. The Cisco WAE Appliances are deployed symmetrically as edge devices at branches and remote sites and as core devices at the data center as shown in Figure 2. The Cisco WAE Appliances can be deployed out-of-band using Web Cache Communication Protocol (WCCP) or Policy Based Routing (PBR). WCCP, which is offered as a free feature in Cisco IOS Software provides N+1 and higher redundancy and load balancing capabilities for Cisco WAE deployments and simplifies installation of Cisco WAE devices in the branch or data center networks. The Cisco WAE devices can also be deployed in-line to the network with an optional 4-port Gigabit network interface case with fail-to-wire capability.

Figure 2. Cisco WAAS Deployment Architecture



### Cisco WAE-512 Wide Area Application Engine

The Cisco WAE-512 Wide Area Application Engine (Figure 3) is designed for small to medium size branch edge deployments and provides customers with a low-cost, high-performance platform to host Cisco's WAN optimization and application acceleration solutions. The Cisco WAE-512 is designed to easily integrate into existing branch network infrastructure, both logically and physically and is provided in a single rack-unit form factor. The Cisco WAE-512 includes 1GB of RAM in the base chassis with options to upgrade to 2GB of RAM for improved performance and scaling. When deployed with Cisco WAAS, two front-loadable Serial Advanced Technology Attachment (SATA) disk drive bays can be configured with up to two 250GB hard disk drives using Redundant Array of Independent Disks (RAID; simple swap) to facilitate high disk availability. The Cisco WAE-512 can optionally be configured with an MPEG video decoder for baseband video capability. The MPEG decoder card is available only when using Cisco ACNS Software. The part number for the Cisco WAE-512 is WAE-512-K9.

**Figure 3.** Cisco WAE-512



### Cisco WAE-612 Wide Area Application Engine

The Cisco WAE-612 Wide Area Application Engine (Figure 4) is designed to address the deployment needs at the edge in large enterprise branches and regional offices as well as core installations in medium-sized data centers. The Cisco WAE-612 offers greater performance, reliability and scale than the Cisco WAE-512. The Cisco WAE-612 includes a powerful dual-core processor, two front-loadable Serial Attached SCSI (SAS) hard disks bays that can be configured with 300 GB hard disk drives using RAID-1 when using Cisco WAAS. Offered in a single rack-unit form factor for easy deployment, the base system includes 2 GB of RAM with options to upgrade to 4GB of RAM for greater performance and scale. The Cisco WAE-612 can optionally be configured with an MPEG video decoder for baseband video capability. The MPEG decoder card is available only when using Cisco ACNS Software. The part number for the Cisco WAE-612 is WAE-612-K9.

**Figure 4.** Cisco WAE-612



### Cisco WAE-7326 Wide Area Application Engine

The Cisco WAE-7326 Wide Area Application Engine (Figure 5) offers the highest level of performance and availability in the Cisco WAE Appliance product line and is designed for deployment as a core WAN optimization and application acceleration device in large enterprise data centers. The Cisco WAE-7326 includes 4 GB of RAM and is designed to provide customers with the maximum WAN optimization and application acceleration performance and very high scalability. The Cisco WAE-7326 includes two hot swappable redundant power supplies and is provided in a two rack-unit form factor. The Cisco WAE-7326 supports a minimum of two and a maximum of six front-accessible, hot-swappable internal SCSI hard disks with support for up to 1.8 TB of storage. When deployed using WCCPv2, up to 32 Cisco WAE-7326s can be grouped together in a service group to support the largest enterprise deployments. The part number for the Cisco WAE-7326 is WAE-7326-K9.

**Figure 5.** Cisco WAE-7326



**Table 1.** Cisco WAE Appliance Product Line Positioning

Platform	Processor	Maximum Hard Disk Drive Capacity	RAM Capacity	Positioning
<b>Cisco WAE-512</b>	One single core processor	2 X 250 GB	1 to 2 GB	Edge deployments at small and medium-sized branch offices
<b>Cisco WAE-612</b>	One dual core processor	2 X 300 GB	2 to 4 GB	Edge deployments at medium and large enterprise branches Core deployments at medium-sized data centers
<b>Cisco WAE-7326</b>	Two processors	6 X 300 GB	4 GB	Core deployments at large and very large data centers Edge branch deployments at very large branches, enterprise edge

## Cisco WAE Software and Product Function Matrix

All Cisco WAE models can be configured to run Cisco WAAS Software, Cisco WAFS Software or Cisco ACNS Software, allowing customers who are using any of these applications to have a common hardware sparing model, simplifying operations and reducing overall costs. A separate license is required for each software version, and no two software options can be installed or run concurrently.

### Cisco WAE Configured with Cisco WAAS Software or Cisco WAFS Software

Cisco WAAS Software Version 4.0 and above or Cisco Software Release WAFS 3.0.7 and above can be deployed on the Cisco WAE platforms. Cisco WAAS is licensed at two levels of feature capability as described below:

- **Transport license:** The Cisco WAAS Transport license provides all the WAN optimization capabilities of Cisco WAAS to help organizations improve performance for applications that are already centralized. The Cisco WAAS Transport license includes the Cisco WAAS Data Redundancy Elimination (DRE) feature, session-based adaptive Lempel-Ziv (LZ) compression, Cisco WAAS Transport Flow Optimization (TFO), and central management capability
- **Enterprise license:** The Cisco WAAS Enterprise license provides all the capabilities of the Cisco WAAS Transport license plus application-specific acceleration and server off-loading services for the Common Internet File System (CIFS) protocol as well as Windows printing services to help IT organizations consolidate costly remote office server and storage infrastructure, while providing enhanced collaboration experience and centralized data protection.

**Table 2.** Cisco WAE Deployed with Cisco WAAS or Cisco WAFS: Product Function Matrix

	Cisco WAE-512	Cisco WAE-612	Cisco WAE-7326
Cisco WAAS Transport License	Y	Y	Y
Cisco WAAS Enterprise License	Y	Y	Y
Cisco WAAS Central Manager License	Y	Y	Y
Cisco WAFS Software Release 3.0.7	Y	Y	Y
Cisco WAFS Software Release 3.0.7 Central Manager	Y	Y	Y

### Cisco WAE Configured with Cisco ACNS Software

Cisco ACNS Software Version 5.4.3 or 5.5.1 and above can be deployed on the Cisco WAE Appliance platforms. Cisco ACNS Software can be configured on some models as a content engine, content router, or content distribution manager (CDM). All products are ordered and shipped directly from the factory as content engines. On the supported models, content engines can be changed with a command-line interface (CLI) command. The product can have only one function (content engine, content router, or CDM) and cannot be configured to perform any two functions simultaneously. Cisco WAE and Content Engine (CE) platforms sold with Cisco ACNS Software earlier than Version 5.0 can run Cisco ACNS Software Version 5.0 or later, but cannot be reconfigured as described here.

**Table 3.** Cisco WAE Deployed with Cisco ACNS: Product Function Matrix

	Cisco WAE-512	Cisco WAE-612	Cisco WAE-7326
Cisco ACNS Software (Version 5.5.1)	Y	Y	Y
Cisco ACNS CDM	–	Y	Y
Cisco ACNS Content Router	–	Y	Y
Cisco IP/TV <sup>®</sup> Program Manager	–	Y	Y

## Cisco WAE Hardware Specifications

**Table 4.** Cisco WAE Hardware Specifications

	Cisco WAE-512	Cisco WAE-612	Cisco WAE-7326
<b>Baseline RAM</b>	1 GB	2 GB	4 GB
<b>Maximum RAM</b>	2 GB	4 GB	4 GB
<b>Maximum storage</b>	Two 250-GB SATA hard drives	Two 300-GB SAS hard drive	Six 300-GB SCSI hard drives
<b>Network interfaces</b>	Two 10/100/1000BASE-T	Two 10/100/1000BASE-T	Two 10/100/1000BASE-T
<b>Power</b>	One 350W AC	One 350W AC	Two 625W hot-swappable redundant AC
<b>Rack units</b>	One	One	Two
<b>MPEG decoder (optional)</b>	<ul style="list-style-type: none"> <li>• Yes (support only with Cisco ACNS Software)</li> <li>• MPEG-1 and 2</li> <li>• DB-15 audio connector</li> <li>• BNC composite video output</li> <li>• 7-pin DIN S-video output connector</li> </ul>	<ul style="list-style-type: none"> <li>• Yes (support only with Cisco ACNS Software)</li> <li>• MPEG-1 and 2</li> <li>• DB-15 audio connector</li> <li>• BNC composite video output</li> <li>• 7-pin DIN S-video output connector</li> </ul>	No
<b>Flash memory</b>	128 MB of Compact Flash memory	128 MB of Compact Flash memory	128 MB of Compact Flash memory
<b>External SCSI connector</b>	No	No	Dual-channel U320 SCSI
<b>Height</b>	1.75 in. (43 mm)	1.75 in. (43 mm)	3.36 in. (85.4 mm)
<b>Width</b>	17.2 in. (440 mm)	17.2 in. (440 mm)	17.5 in. (443.6 mm)
<b>Depth</b>	22.1 in. (559 mm)	22.1 in. (559 mm)	27.64 in. (702.0 mm)
<b>Shipping dimensions (with packaging)</b>	39 x 23 x 6.5 in. (990.6 x 584.2 x 165.1 mm); six boxes per pallet	39 x 23 x 6.5 in. (990.6 x 584.2 x 165.1 mm); six boxes per pallet	39 x 23 x 6.5 in. (990.6 x 584.2 x 254 mm); four boxes per pallet
<b>Maximum weight</b>	28 lb (12.7 kg)	28 lb (12.7 kg)	64lb (29.03 kg)
<b>Universal input</b>	<ul style="list-style-type: none"> <li>• Input voltage low range 100 to 127 VAC</li> <li>• Input voltage high range 200 to 240 VAC</li> <li>• Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>◦ Minimum: 0.102 kVA</li> <li>◦ Maximum: 0.55</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Input voltage low range 100 to 127 VAC</li> <li>• Input voltage high range 200 to 240 VAC</li> <li>• Input kVA approximately: <ul style="list-style-type: none"> <li>◦ Minimum: 0.102 kVA</li> <li>◦ Maximum: 0.55 kVA</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Input voltage low range 100 to 127 VAC</li> <li>• Input voltage high range 180 to 265 VAC</li> <li>• Input kVA approximately: <ul style="list-style-type: none"> <li>◦ Minimum: 0.36 kVA</li> <li>◦ Maximum: 0.83 kVA</li> </ul> </li> </ul>

	Cisco WAE-512	Cisco WAE-612	Cisco WAE-7326
	kVA		
<b>Operating Environment</b>			
Operating temperature	50 to 95°F (10 to 35°C)	50 to 95°F (10 to 35°C)	50 to 95°F (10 to 35°C)
Nonoperating temperature	–40 to 140°F (–40 to 60°C)	–40 to 140°F (–40 to 60°C)	–40 to 140°F (–40 to 60°C)
Humidity	Nonoperating: 8 to 80%	Nonoperating: 8 to 80%	Nonoperating: 8 to 80%
Altitude	Maximum altitude: 6500 ft (2000m)	Maximum altitude: 6500 ft (2000m)	Maximum altitude: 2133m (7000 ft)
Compliance	CE marking	CE marking	CE marking
Safety	<ul style="list-style-type: none"> <li>• UL 1950</li> <li>• CSA-C22.2 No. 950</li> <li>• EN 60950</li> <li>• IEC 60950</li> </ul>	<ul style="list-style-type: none"> <li>• UL 1950</li> <li>• CSA-C22.2 No. 950</li> <li>• EN 60950</li> <li>• IEC 60950</li> </ul>	<ul style="list-style-type: none"> <li>• UL 1950</li> <li>• CSA-C22.2 No. 950</li> <li>• EN 60950</li> <li>• IEC 60950</li> </ul>
EMC	<ul style="list-style-type: none"> <li>• FCC Part 15 (CFR 47) Class A</li> <li>• ICES-003 Class A</li> <li>• EN 55022 Class A with UTP cables</li> <li>• CISPR22 Class A with UTP cables</li> <li>• ASNZ 3548 Class A with UTP cables</li> <li>• VCCI Class A with UTP cables</li> <li>• EN 55024</li> <li>• EN 50082-1</li> </ul>	<ul style="list-style-type: none"> <li>• FCC Part 15 (CFR 47) Class A</li> <li>• ICES-003 Class A</li> <li>• EN 55022 Class A with UTP cables</li> <li>• CISPR22 Class A with UTP cables</li> <li>• ASNZ 3548 Class A with UTP cables</li> <li>• VCCI Class A with UTP cables</li> <li>• EN 55024</li> <li>• EN 50082-1</li> </ul>	<ul style="list-style-type: none"> <li>• FCC Part 15 (CFR 47) Class A</li> <li>• ICES-003 Class A</li> <li>• EN 55022 Class A with UTP cables</li> <li>• CISPR22 Class A with UTP cables</li> <li>• ASNZ 3548 Class A with UTP cables</li> <li>• VCCI Class A with UTP cables</li> <li>• EN 55024</li> <li>• EN 50082-1</li> </ul>

## Ordering Information

Cisco WAE Hardware cannot be ordered separately and has to be ordered with one of Cisco WAAS, Cisco WAFS or Cisco ACNS Software Options as described.

**Table 5.** Part Numbers for Cisco WAE Hardware

Product Part Number	Hardware and Software Configuration Options
<b>WAE-512-K9</b>	<ul style="list-style-type: none"> <li>• <b>Software options:</b> Cisco ACNS Software, Cisco WAFS Software or Cisco WAAS Software</li> <li>• <b>Storage options:</b> One of the following two hard-disk-drive (HDD) bay configuration options <ul style="list-style-type: none"> <li>◦ One or two 80-GB serial advanced technology attachment (SATA) drives (part number DISK-SATA2-80GB) for a total of 160 GB of internal storage (Cisco ACNS only)</li> <li>◦ One or two 250-GB SATA drives (part number DISK-SATA2-250GB) for a total of 500 GB of internal storage</li> </ul> </li> <li>• <b>Memory options:</b> One additional 1-GB memory module (part number MEM-WAE-1GB) for a total of 2 GB internal memory</li> <li>• <b>Additional options for Cisco ACNS Software only:</b> MPEG decoder card (part number CE-VIDEO-1P-D)</li> </ul>

<sup>1</sup> The Cisco WAE Appliances do not support combination of hard-drive sizes.

Product Part Number	Hardware and Software Configuration Options
<b>WAE-612-K9</b>	<ul style="list-style-type: none"> <li>• <b>Software options:</b> Cisco ACNS Software, Cisco WAFS Software or Cisco WAAS Software</li> <li>• <b>Storage options:</b> One of the following two hard-disk-drive (HDD) bay configuration options<sup>1</sup> <ul style="list-style-type: none"> <li>◦ Two 146-GB serial attached SCSI (SAS) drives (part number DISK-SAS-146GB) for a total of 292 GB of internal storage (Cisco ACNS only)</li> <li>◦ Two 300-GB SAS drives (part number DISK-SAS-300GB) for a total of 600 GB of internal storage</li> </ul> </li> <li>• <b>Memory options:</b> Two additional 1-GB memory modules (part number MEM-WAE-2GB) for a total of 4 GB internal memory</li> <li>• <b>Additional options for Cisco ACNS Software only:</b> MPEG decoder card (part number CE-VIDEO-1P-D)</li> </ul>
<b>WAE-7326-K9</b>	<ul style="list-style-type: none"> <li>• <b>Software options:</b> Cisco ACNS Software, Cisco WAFS Software or Cisco WAAS Software</li> <li>• <b>Storage options:</b> One of the following three hard-disk-drive (HDD) bay configuration options<sup>1</sup> <ul style="list-style-type: none"> <li>◦ Two to six 72-GB SCSI drives (part number DISK-SCSI-72GB) (Cisco ACNS only)</li> <li>◦ Two to six 144-GB SCSI drives (part number DISK-SCSI-144GB)</li> <li>◦ Two to six 300-GB SCSI drives (part number DISK-SCSI-300GB)</li> </ul> </li> <li>• <b>Memory options:</b> Two additional 1-GB memory modules (part number MEM-WAE-2GB) for a total of 4 GB internal memory</li> <li>• <b>Additional options for Cisco ACNS Software only:</b> MPEG decoder card (part number CE-VIDEO-1P-D)</li> </ul>
<b>Hardware Spares</b>	
CE-VIDEO-1P-D=	MPEG 1,2 video decoder, spare
DISK-SATA2-80GB(=)	80-GB HDD (SATA2), spare
DISK-SATA2-250GB(=)	250-GB HDD (SATA2), spare
DISK-SAS-146GB(=)	146-GB HDD (SAS), spare
DISK-SAS-300GB(=)	300-GB HDD (SAS), spare
DISK-SCSI-72GB(=)	72 GB SCSI Disk Drive for WAE-7326, Spare
DISK-SCSI-144GB(=)	144 GB SCSI Disk Drive for WAE-7326, Spare
DISK-SCSI-300GB(=)	300 GB SCSI Disk Drive for WAE-7326, Spare
MEM-WAE-1GB(=)	1x WAE 1GB memory module
MEM-WAE-2GB(=)	2x WAE 1GB memory modules
Single Power Cord	

## WCCP Support

WCCP is a free software feature in Cisco IOS software that runs on the following Cisco platforms: Cisco routers such as the 1800, 2600, 2800, 3600, 3700, 3800, and 7000 families. Cisco switches such as the Catalyst 4500, 4900, and 6500 families.

## 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 to protect your network investment, optimize network operations, and prepare your 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, visit <http://www.cisco.com/go/waas> or contact your local account representative.



**Americas Headquarters**  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
[www.cisco.com](http://www.cisco.com)  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

**Asia Pacific Headquarters**  
Cisco Systems, Inc.  
168 Robinson Road  
#28-01 Capital Tower  
Singapore 068912  
[www.cisco.com](http://www.cisco.com)  
Tel: +65 6317 7777  
Fax: +65 6317 7799

**Europe Headquarters**  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
[www-europe.cisco.com](http://www-europe.cisco.com)  
Tel: +31 0 800 020 0791  
Fax: +31 0 20 357 1100

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