Cisco Wide Area Application Services (WAAS) Network Module

Cisco® Wide Area Application Services (WAAS) Network Modules (NME) for Cisco Integrated Services routers (ISR), and the second-generation (G2) Integrated Services Routers, are powerful application acceleration and WAN optimization solutions that accelerates the performance of any TCP-based application delivered across a WAN, providing the benefits of branch-office data consolidation, and acceleration of centralized applications. Cisco WAAS allows customers to consolidate costly branch-office servers and storage within 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 greater overall security.

Cisco WAAS enables organizations to accomplish these primary IT objectives:

- Improve employee productivity by enhancing the user experience for important business applications
- Reduce the cost of branch-office operations by centralizing IT resources within the data center and reducing the cost of WAN bandwidth
- Increase IT agility by reducing the time and resources required to deliver new IT services to the branch location
- Simplify data protection and business continuance for regulatory compliance

Unlike other WAN optimization products, Cisco WAAS provides:

- Network integration that preserves existing network services and results in ease of operations
- Application-specific acceleration validated by application vendors
- A highly cost-effective solution

Product Line

Cisco WAAS platforms are available as appliances and as integrated modules for Cisco ISR and ISR G2 platforms.

- Appliance-based product lines include Cisco Wide Area Application Engine (WAE) and Wide Area Virtualization Engine (WAVE) products.
- Integrated modules are available as Cisco SRE Modules for Cisco ISR G2 routers and Cisco WAAS Network Modules (NMEs) for Cisco ISR and ISR G2 routers. NME adaptors are required to use network modules on the Cisco ISR G2 platforms.

Addressing varying customer needs based on branch-office size, bandwidth availability, and use patterns, the Cisco WAAS hardware product line is designed to scale from small to very large enterprise-wide deployments. Cisco software on Cisco SRE modules and WAAS NMEs are typically are deployed as edge devices at branch locations. The Cisco WAE and WAVE appliances are deployed symmetrically as edge devices at branch locations and as core devices at the data center, as shown in Figure 1. For more information about Cisco WAE Appliances, please refer to the [Cisco WAE Appliance data sheet](). The Cisco WAVE and WAE-674 appliances can host local branch IT services on Cisco WAAS virtual blades. For more information about Cisco WAVE appliances, please refer to the [Cisco WAVE Appliance data sheet]().

Figure 1.   Cisco WAAS Deployment Architecture
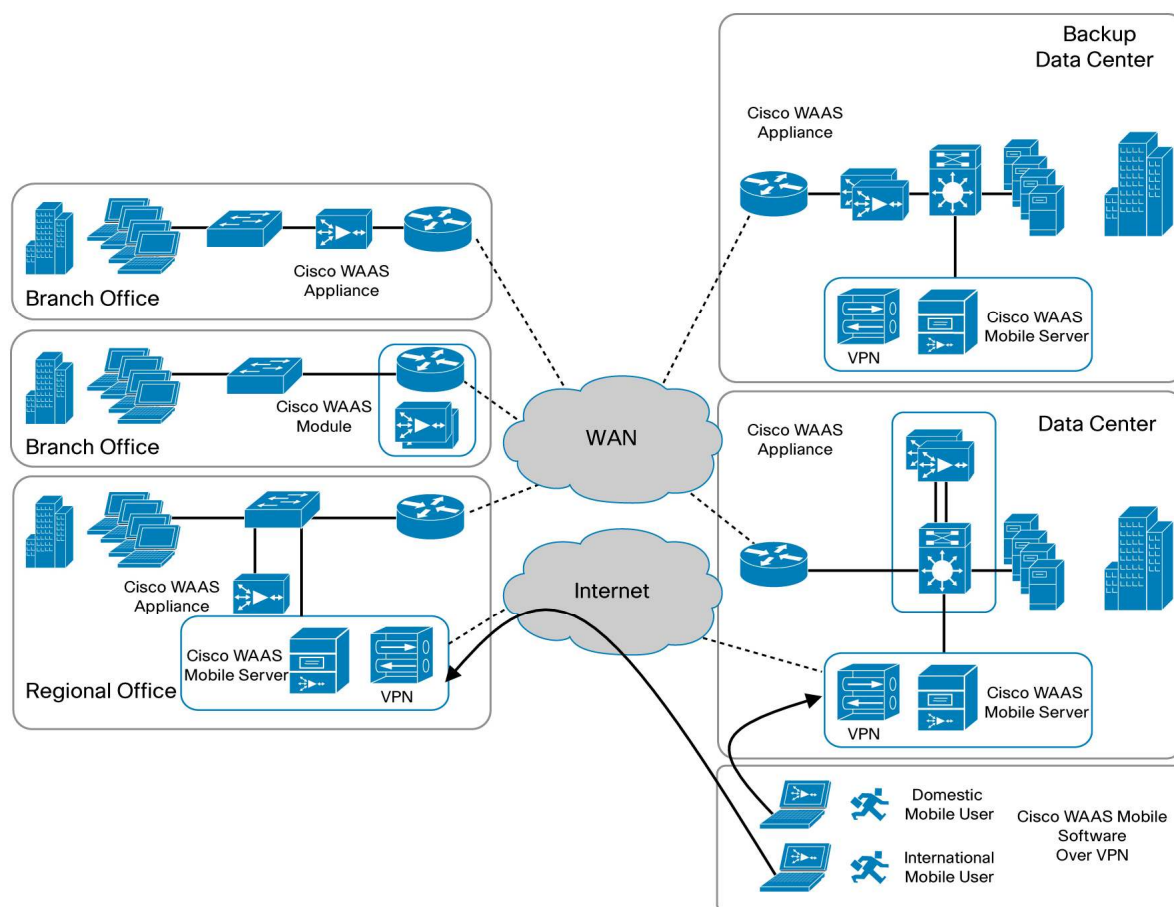
Cisco WAAS Software License Options

Cisco WAAS Software has two licenses for use on the Cisco WAAS NME:

- Transport license: The Cisco WAAS Transport license provides the WAN optimization features of Cisco WAAS, including data redundancy elimination (DRE), Lempel-Ziv (LZ) compression, and transport flow optimization (TFO), optimizing application delivery to the branch office.

- Enterprise license: The Cisco WAAS Enterprise license provides Cisco WAAS Transport license functions plus application-specific accelerations for protocols including Common Internet File System (CIFS), Messaging API (MAPI), HTTP, SSL, Network File System (NFS), and Windows print services, to facilitate application acceleration, WAN optimization, and IT consolidation.

Product Line Positioning

Cisco WAAS NMEs (Figure 2) are offered in three fixed configurations, as described in Table 1.

- The Cisco NME-WAE-302 supports core WAN optimization features for small branch offices where bandwidth constraints affect application performance. The Cisco NME-WAE-302 is supported in Cisco 2800 and 3800 Series Integrated Services Routers.

- The Cisco NME-WAE-502 offers Cisco WAAS edge functions, allowing enterprises to consolidate branch-office infrastructure, accelerate applications, optimize the WAN, and improve backup operations. The Cisco NME-WAE-502 is supported in the Cisco 2800 and 3800 Series and 2911, 2921, 2951, 3925, and 3945 Integrated Services Routers. ISR G2 router platforms require an NME adapter card.

- The Cisco NME-WAE-522 offers greater scale and the highest investment protection for up to medium-sized enterprise branch offices. The Cisco NME-WAE-522 is supported in the Cisco 2800 and 3800 Series routers.

Table 1.   Cisco WAAS NME Product Line Positioning

Platform	Hardware	Router Model	Positioning
Cisco NME-WAE-302	• 512-MB RAM • 80-GB hard disk drive (HDD)	• Supported on Cisco 2800 and 3800 Series routers	• Low-cost, entry-level platform for use with Cisco WAAS Transport license for basic WAN optimization features; Cisco WAAS Enterprise license **not** supported • Edge deployments at small branch offices
Cisco NME-WAE-502	• 1-GB RAM • 120-GB HDD	• Supported on Cisco 2800 and 3800 Series routers • Supported on Cisco 2911, 2921, 2951, 3925, and 3945 G2 routers with an NME adapter card	• Cisco WAAS Transport and Enterprise licenses supported for edge deployment supporting application acceleration, WAN optimization, and server consolidation • Edge deployments at small and medium-sized branch offices
Cisco NME-WAE-522	• 2-GB RAM • 160-GB HDD	• Supported on Cisco 3800 Series routers	• Cisco WAAS Transport and Enterprise licenses supported for edge deployment supporting application acceleration, WAN optimization, and server consolidation • Edge deployments at up to medium-sized branch offices

Figure 2.   Cisco WAAS NME

Product Specifications

Table 2 gives product specifications for the Cisco WAAS NMEs.

Table 2.   Cisco WAAS NME Specifications

	Cisco NME-WAE-302-K9	Cisco NME-WAE-502-K9	Cisco NME-WAE-522-K9
RAM	512 MB	1 GB	2 GB
Hard disk	80 GB	120 GB	160 GB
Router platforms	Cisco 2811, 2821, 2851, 3825, and 3845 routers	Cisco 2811, 2821, 2851, 3825, and 3845 routers Cisco 2911, 2921, 2951, 3925 and 3945 G2 routers	Cisco 3825 and 3845 routers
Cisco IOS® Software (on router)	Cisco IOS Software Release 12.4(9)T or later	Cisco IOS Software Release 12.4(9)T or later for routers Cisco IOS Software Release 15.0(1)M for G2 routers	Cisco IOS Software Release 12.4(15)T or later
Cisco WAAS license options	Cisco WAAS Transport license	Cisco WAAS Transport license Cisco WAAS Enterprise license	Cisco WAAS Transport license Cisco WAAS Enterprise license
Cisco WAAS Software	Cisco WAAS Software Version 4.0.3 or later	Cisco WAAS 4.0.3 or later for routers Cisco WAAS 4.1.5 or later for G2 routers	Cisco WAAS 4.0.13 or later
Internal network interfaces	10/100/1000 Gigabit Ethernet connectivity to router backplane	10/100/1000 Gigabit Ethernet connectivity to router backplane	10/100/1000 Gigabit Ethernet connectivity to router backplane

	Cisco NME-WAE-302-K9	Cisco NME-WAE-502-K9	Cisco NME-WAE-522-K9
External network interfaces	10/100/1000 Gigabit Ethernet	10/100/1000 Gigabit Ethernet	10/100/1000 Gigabit Ethernet
Flash memory	64-MB compact flash memory	64-MB compact flash memory	64-MB compact flash memory
Physical characteristics	• Dimensions (H x W x D): 1.55 x 7.10 x 7.2 in. (3.9 x 18.0 x 18.3 cm) • Weight: 1.5 lb (0.7 kg) maximum	• Dimensions (H x W x D): 1.55 x 7.10 x 7.2 in. (3.9 x 18.0 x 18.3 cm) • Weight: 1.5 lb (0.7 kg) maximum	• Dimensions (H x W x D): 1.55 x 7.10 x 7.2 in. (3.9 x 18.0 x 18.3 cm) • Weight: 1.5 lb (0.7 kg) maximum
Operating environment	• Operating temperature: 41 to 104°F (5 to 40°C) • Nonoperating and storage temperature: -40 to 158°F (-40 to 70°C) • Operating humidity: 5 to 85% (noncondensing) • Operating altitude: -197 to 6000 ft (-60 to 1800m)	• Operating temperature: 41 to 104°F (5 to 40°C) • Nonoperating and storage temperature: -40 to 158°F (-40 to 70°C) • Operating humidity: 5 to 85% (noncondensing) • Operating altitude: -197 to 6000 ft (-60 to 1800m)	• Operating temperature: 41 to 104°F (5 to 40°C) • Nonoperating and storage temperature: -40 to 158°F (-40 to 70°C) • Operating humidity: 5 to 85% (noncondensing) • Operating altitude: -197 to 6000 ft (-60 to 1800m)
Safety	• UL 60950-1, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (USA); plastic materials that are exposed to the end user shall meet the requirements of fire enclosure (UL94V-1) as defined in UL 60950 • CSA 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (Canada) • IEC 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements, including all national deviations as specified in the current CB Bulletin • EN 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (European Union) incorporating all Deviations, as applicable • GB 4943-95, Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950) • AS/NZS 60950.1 Information technology equipment, Safety Part 1: General requirements (Australia)	• UL 60950-1, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (USA); plastic materials that are exposed to the end user shall meet the requirements of fire enclosure (UL94V-1) as defined in UL 60950 • CSA 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (Canada) • IEC 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements, including all national deviations as specified in the current CB Bulletin • EN 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (European Union) incorporating all Deviations, as applicable • GB 4943-95, Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950) • AS/NZS 60950.1 Information technology equipment, Safety Part 1: General requirements (Australia)	• UL 60950-1, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (USA); plastic materials that are exposed to the end user shall meet the requirements of fire enclosure (UL94V-1) as defined in UL 60950 • CSA 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (Canada) • IEC 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements, including all national deviations as specified in the current CB Bulletin • EN 60950-1, Second Edition, Safety of Information Technology Equipment-Safety-Part 1: General Requirements (European Union) incorporating all Deviations, as applicable • GB 4943-95, Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950) • AS/NZS 60950.1 Information technology equipment, Safety Part 1: General requirements (Australia)
EMC	• Emission: • 47 CFR Part 15 Class A • CISPR22 Class A • EN300386 Class A • EN55022 Class A • EN61000-3-2 • EN61000-3-3 • SD/EMI (India) • KN22 (Korea) • VCCI Class I • AS/NZS CISPR 22 Class A • Immunity: • CISPR24 • EN300386 • EN50082-1	• Emission: • 47 CFR Part 15 Class A • CISPR22 Class A • EN300386 Class A • EN55022 Class A • EN61000-3-2 • EN61000-3-3 • SD/EMI (India) • KN22 (Korea) • VCCI Class I • AS/NZS CISPR 22 Class A • Immunity: • CISPR24 • EN300386 • EN50082-1	• Emission: • 47 CFR Part 15 Class A • CISPR22 Class A • EN300386 Class A • EN55022 Class A • EN61000-3-2 • EN61000-3-3 • SD/EMI (India) • KN22 (Korea) • VCCI Class I • AS/NZS CISPR 22 Class A • Immunity: • CISPR24 • EN300386 • EN50082-1

	Cisco NME-WAE-302-K9	Cisco NME-WAE-502-K9	Cisco NME-WAE-522-K9
	• EN55024 • SD/EMI (India) • KN22 (Korea) • EN61000-6-1	• EN55024 • SD/EMI (India) • KN22 (Korea) • EN61000-6-1	• EN55024 • SD/EMI (India) • KN22 (Korea) • EN61000-6-1

Ordering Information

To order the Cisco WAE appliance hardware, please refer to the Cisco WAE Appliance data sheet. Table 3 lists Cisco WAAS NME hardware part numbers and related Cisco WAAS Software options.

Table 3.   Part Numbers for Cisco WAAS NMEs and Software

Part Number	Product Description
NME-WAE-302-K9	Cisco WAAS Network Module for Cisco 2800 and 3800 Series Integrated Services Routers, 512 MB RAM, 80 GB HDD, Only WAAS Transport supported.
NME-WAE-502-K9	Cisco WAAS Network Module for Cisco 2800 and 3800 Series ISR, and Cisco 2911, 2921, 2951, 3925 and 3945 ISR G2, 1 GB RAM, 120 GB HDD. WAAS Transport and WAAS Enterprise supported.
NME-WAE-522-K9	Cisco WAAS Network Module for Cisco 3800 Series Integrated Services Routers, 2GB RAM, 160 GB HDD, WAAS Transport and WAAS Enterprise supported.
SM-NM-ADPTR	Cisco Service Module Network Module Adapter Card for 1 NME-WAE-502-K9 required for deployment in ISR G2 2911, 2921, 2951, 3925 and 3945 routers.
WAAS-TRN-NM	Cisco WAAS Transport license for 1 network module.
WAAS-ENT-NM	Cisco WAAS Enterprise license for 1 NME-WAE-502-K9.
WAAS-VIDEO-WM-NM	Cisco WAAS Video License for Windows Live Media Streaming for 1 network module.
WAAS-ENT-NM-BUN	Cisco WAAS Enterprise license for 1 Bundle of NME-WAE-502-K9 with ISR 2800, 3800 series (Please refer ISR documentation for router bundle SKUs information).

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; and Cisco 7000 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 to accelerate customer success, 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 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 and Cisco WAE solutions, visit http://www.cisco.com/go/waas or contact your local Cisco account representative.

For more information about Cisco integrated services routers, visit http://www.cisco.com/go/isr, http://www.cisco.com/go/isrg2, and http://www.cisco.com/go/sre or contact your local Cisco account representative.

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