

Cisco 860VAE Series Integrated Services Routers

Product Overview

The new Cisco® 860VAE Series Integrated Services Routers (ISRs) are part of the Cisco Integrated Services Routers Generation 2 (ISR G2) portfolio. Cisco 860VAE routers support Gigabit Ethernet (GE) or very-high-speed DSL 2/asymmetric DSL2+ (VDSL2/ADSL2+) on a single, fixed ISR. The Cisco 860VAE Series can provide cost-effective basic or secure wired or wireless connectivity for a casual or enterprise teleworker as well as serve as managed customer premises equipment (CPE) for service providers.

Features and Benefits

Cisco 860VAE Series ISRs are entry-level, fixed-configuration routers that serve a range of business needs from providing basic connectivity for the casual teleworker to providing secure collaboration for the enterprise teleworker. For service providers, the Cisco 860VAE ISRs present an opportunity for tiered basic or secure managed CPE devices. With multiple WAN technologies offered within a single box (GE, ADSL2+, or VDSL2), the Cisco 860VAE, which shares a common architecture across its variants, allows for consistent management across various deployment scenarios. The Cisco 860VAE ISRs that come in a compact fanless desktop form factor provide improved performance, state-of-the-art xDSL features, and significantly better interoperability over the older Cisco 860 Series ISRs.

The Cisco 860VAE Series Integrated Services Routers offer:

- Cost-effective basic or secure connectivity with quality of service (QoS) for teleworkers and managed CPE devices for service providers
- Compact metallic desktop form factor featuring a fanless ISR for convenient home or office deployment
- WAN diversity with either Gigabit Ethernet or Multimode VDSL2/ADSL2+ on the same router to span multiple deployment scenarios with common architecture, embedded management, and consistent configurability
- State-of-the-art xDSL features and interoperability and enhanced ISR performance with services
- Four-port 10/100 Fast Ethernet (FE) managed switch for base models with five VLANs; additionally, one Gigabit Ethernet LAN port for the Cisco 860VAE secure routers
- Three 10/100 Fast Ethernet switch ports and two Gigabit Ethernet switch ports in the wireless models with 2.4 GHz 802.11n FCC- or ETSI-compliant wireless LAN
- Secure routers with enhanced security and QoS, including:
 - Border Gateway Protocol (BGP), Low-Latency Queuing (LLQ), and Weighted Fair Queuing (WFQ)
 - Class-based traffic shaping and traffic policing
 - Ten IP Security (IPsec) tunnels
 - Network-Based Application Recognition (NBAR) and Differentiated Services (DiffServ)
- CON/AUX port for console or external modem
- One USB 2.0 port to boot from USB or to load configuration
- IPv6 support on all models

Figure 1 shows a Cisco 860VAE Integrated Services Router, and Table 1 lists the Cisco 860VAE ISR models.

Figure 1. Cisco 860VAE Integrated Services Router



Cisco 860VAE ISR: Three Functional Types

The Cisco 860VAE ISRs come in three functional types, the base router, which offers entry-level features and basic connectivity, the secure router, which offers advanced security and QoS options in addition to the basic features, and a secure wireless router, which adds wireless LAN connectivity and FlexVPN including site-to-site VPN. Each of these options is available for basic telephone service and ISDN xDSL connections.

Table 1. Cisco 860VAE Models

Models	WAN Interfaces	LAN Interfaces
Cisco 866VAE	GE or Multimode VDSL2/ADSL2+ over ISDN	4-port 10/100-Mbps managed switch
Cisco 866VAE-K9 Secure Router	GE or Multimode VDSL2/ADSL2+ over ISDN	1 GE + 4-port 10-/100-Mbps managed switch
Cisco 867VAE	GE or Multimode VDSL2/ADSL2+ over basic telephone service	4-port 10-/100-Mbps managed switch
Cisco 867VAE-K9 Secure Router	GE or Multimode VDSL2/ADSL2+ over basic telephone service	1 GE + 4-port 10-/100-Mbps managed switch
C866VAE-W-E-K9 Wireless Secure Router	GE or Multimode VDSL2/ADSL2+ over ISDN	2 GE + 3-port 10-/100-Mbps managed switch 802.11n 2.4 GHz ETSI-compliant wireless LAN
C867VAE-W-E-K9 Wireless Secure Router	GE or Multimode VDSL2/ADSL2+ over basic telephone service	2 GE + 3-port 10-/100-Mbps managed switch 802.11n 2.4 GHz ETSI-compliant wireless LAN
C867VAE-W-A-K9 Wireless Secure Router	GE or multimode VDSL2/ADSL2+ over basic telephone service	2 GE + 3-port 10-/100-Mbps managed switch 802.11n 2.4G Hz FCC-compliant wireless LAN
C867VAE-POE-W-A-K9 Wireless Secure Router	GE or multimode VDSL2/ADSL2+ over basic telephone service	2 GE + 3-port 10-/100-Mbps managed switch with integrated 1 port Power over Ethernet (PoE) 802.11n 2.4 GHz ETSI-compliant wireless LAN

Features and Benefits

Table 2 lists the features and benefits of the Cisco 860VAE Series Routers.

Table 2. Features and Benefits of Cisco 860VAE Series Routers

Feature	Benefit
Increased performance	<ul style="list-style-type: none"> Performance that allows customers to take advantage of broadband network speeds while running secure, concurrent data, voice, and video services
Security and quality of service (QoS) with secure routers	<ul style="list-style-type: none"> IPsec and Easy VPN with 10 tunnels BGP MAC filtering and port security QoS features that include LLQ and WFQ NBAR and DiffServ
State-of-the-art xDSL	<ul style="list-style-type: none"> State-of-the-art xDSL features as per the latest ADSL2+/VDSL2 standards Improved interoperability vs. various DSL access multiplexers (DSLAMs) deployed at worldwide service providers
WAN diversity	<ul style="list-style-type: none"> GE or DSL Multimode VDSL2 and ADSL 1, 2, and 2+ Multiple WAN options within the same box to allow consistent configuration across diverse deployments

Feature	Benefit
Managed switch with GE and FE LAN ports	<ul style="list-style-type: none"> • Connection of multiple devices within a teleworker home or a small office, with the ability to designate a port as the network edge • VLANs that allow for secure segmentation of network resources
Wireless LAN	<ul style="list-style-type: none"> • 802.11n 2.4 GHz FCC- or ETSI-compliant WiFi • Cisco IOS® Software command-line interface (CLI) or web-based configuration with Admin/Guest role-based access.
CON/AUX port	<ul style="list-style-type: none"> • A single dual-purpose port that provides direct connection to a console or external modem for management or backup access point
Real-time clock	<ul style="list-style-type: none"> • A built-in real-time clock that maintains an accurate date and time for applications that require an accurate time stamp, such as logging and digital certificates

Why Upgrade to the New Cisco 860VAE ISRs?

Numerous compelling features are in the new Cisco 860VAE ISRs (Table 3).

Table 3. Comparison of Features Between New Cisco 860VAE ISRs and Older Cisco 860 Series Routers

Feature	Base Router 860VAE	Secure Router 860VAE K9	Secure Wireless Router 860VAE-W-K9	Older 860 Series Routers
WAN diversity	1 GE ADSL2+ basic telephone service/ISDN VDSL2 over ISDN	1 GE ADSL2+ basic telephone service/SDN VDSL2 over ISDN	1 GE ADSL2+ basic telephone service/SDN VDSL2 over ISDN	1 FE ADSL basic telephone service
LAN ports	4 FE	4 FE + 1 GE	3 FE + 2 GE + 802.11n	4 FE
Advanced security	No	Yes	Yes	No
QOS	No	Yes	Yes	No
Performance with services	10 Mbps	10 Mbps	10 Mbps	3 Mbps
Multimode VDSL2/ADSL2+ and industry-leading xDSL interoperability	Yes	Yes	Yes	No
Box appearance and form factor	Compact metal body, fanless quiet, and home-friendly desktop form factor	Compact metal body, fanless quiet, and home-friendly desktop form factor	Compact metal body, fanless quiet, and home-friendly desktop form factor	Fan; not home-friendly

Summary

Cisco 860VAE Series Integrated Services Routers combine increased network performance with advanced security to allow teleworkers to get the most from their broadband connections at a very affordable price. Cisco 860VAE Series Routers can be deployed at any small- or branch-office location, including standalone service orchestration points such as ATM machines or point-of-sale (POS) systems. With the Cisco 860VAE Series, service providers can take advantage of a solution that can be set up easily at a remote site and centrally managed across diverse deployment scenarios. The Cisco 860VAE Series provides excellent value by reducing operating expenses (OpEx) and capital expenditures (CapEx) and hence the total cost of ownership (TCO) while providing the latest connectivity and security features.

Product Specifications

Cisco IOS Software Support

Table 4 lists the minimum Cisco IOS Software releases and the default Cisco IOS Software feature sets.

Table 4. Cisco IOS Software Releases and Default Cisco IOS Software Feature Sets

Models	Cisco IOS Software Image	Default Feature Set	First Cisco IOS Software Release
Cisco 866VAE and 867VAE	c860vae-ipbasek9-mz	IPBase	15.2(2)T or 15.1(4)M2
Cisco 866VAE-K9 and 867VAE-K9	c860vae-advsecurityk9-mz c860vae-advsecurityk9_npe-mz	Advanced Security	15.2(2)T or 15.1(4)M2
C866VAE-W and C867VAE-W	c860vaew-advsecurityk9-mz	Advanced Security with Wireless	15.3(3)M

Cisco IOS Software IP Base Feature Set on Base Routers

Cisco 860VAE Base Routers support the IP Base features listed in Table 5.

Table 5. Cisco IOS Software Features on Cisco 860VAE Base Router Series: IP Base Feature Set

Feature	Description
IP and IP services features	<ul style="list-style-type: none"> • Basic IP data connectivity including: <ul style="list-style-type: none"> ◦ IP multicast and IP routing ◦ IPv6 • Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2) • Network Address Translation (NAT) • Access control lists (ACLs) • Dynamic Host Configuration Protocol (DHCP) server, relay, and client • Dynamic Domain Name System (DNS) • DNS proxy and DNS spoofing
xDSL, ATM, and Ethernet in the First Mile (EFM)	<ul style="list-style-type: none"> • G.922.1 (G.dmt Annex A, B), T1.413 (ANSI) • G.992.3 and 5 (ADSL2/2+ Annex A, B, M) • G.993.2 (VDSL2) • ATM QoS, operations, administration, and maintenance (OAM), and loopback • Packet Transfer Mode (PTM) • TX ring adjustment • Point-to-Point Protocol over ATM (PPPoA) • PPP over Ethernet (PPPoE)
Switch features	<ul style="list-style-type: none"> • Auto Media Device In/Media Device Cross Over (MDI-MDX) • Five 802.1Q VLANs
IPv6 features	<ul style="list-style-type: none"> • IPv6 addressing architecture • IPv6 name resolution • IPv6 statistics • IPv6 translation: Transport packets between IPv6-only and IPv4-only endpoints (NAT-PT) • Internet Control Message Protocol Version 6 (ICMPv6) • IPv6 DHCP
Embedded management features	<ul style="list-style-type: none"> • Simple Network Management Protocol Version 3 (SNMPv3) • Secure Shell (SSH) Protocol with Secure HTTP (HTTPS) • Embedded Event Manager (EEM)
Number of recommended users	10

Cisco IOS Software Advanced Security Feature Set on Secure Routers

Cisco 860VAE-K9 Secure Routers have the Advanced Security feature set (Table 6) in addition to the IP Base features (Table 5) supported in Cisco 860VAE Base Routers.

Table 6. Advanced Feature Set on Cisco 860VAE-K9 Secure Router Series

Feature	Description
Security features	Secure connectivity: <ul style="list-style-type: none"> • Ten IPsec tunnels • Easy VPN/IPsec VPN • FlexVPN including Site-Site VPN on 860VAE-W • Firewall • Scansafe Connector
Routing and switching	<ul style="list-style-type: none"> • Border Gateway Protocol (BGP) • MAC Filtering • Port Security • IPv4 VRF-Lite (Support for 4 VRFs)
QoS features	<ul style="list-style-type: none"> • LLQ, WFQ • Class-Based WFQ (CBWFQ) • Policy-Based Routing (PBR) • Class-Based QoS MIB • Class of service (CoS)-to-differentiated services code point (DSCP) mapping • Network-Based Application Recognition (NBAR) • DiffServ
Embedded management features	<ul style="list-style-type: none"> • NetFlow • IP service-level agreement (IP SLA) • Web Services Management Agent

System Specifications

Table 7 lists the system specifications for the Cisco 860VAE Series Routers.

Table 7. System Specifications

Feature	Description
DRAM	<ul style="list-style-type: none"> • 256 MB (nonwireless routers) • 512 MB (wireless routers)
Flash memory	<ul style="list-style-type: none"> • 56 MB for Cisco 866VAE-K9 and 867VAE-K9 Secure Routers • 64 MB for Cisco 866VAE and 867VAE Base Routers • 128 MB for C866VAE-W-K9 and C867VAE-W-K9 Secure Wireless Routers
WAN	<ul style="list-style-type: none"> • Gigabit Ethernet or • Multimode VDSL2 and ADSL2/2+ over ISDN or • Multimode VDSL2 and ADSL2/2+ over basic telephone service
LAN	<ul style="list-style-type: none"> • Base routers: Managed 4-port 10/100BASE-T with autosensing MDI/MDX • Secure routers: 1 GE + 4-port 10/100BASE-T with autosensing MDI/MDX • Secure Wireless routers: 2 GE + 3-port 10/100BASE-T with autosensing MDI/MDX • Secure Wireless routers: 802.11n 2.4 GHz ETSI/FCC compliant

Feature	Description
Console or auxiliary port	RJ-45
Power over Ethernet	1-port 15W PoE on C867VAE-POE-W-A-K9 SKU only
USB	<ul style="list-style-type: none"> ● One USB 2.0 ● USB port can be used for: <ul style="list-style-type: none"> ◦ USB flash memory 128 MB (MEMUSB-128FT), 256 MB (MEMUSB-256FT), and 1 GB (MEMUSB 1024FT) ◦ Cisco IOS Software boot from USB <p>Note: USB 2.0 port cannot be used for connecting external devices or as a console other than those specified at http://www.cisco.com/en/US/prod/collateral/modules/ps6247/product_data_sheet0900aecd80232473.html.</p>
Physical dimensions and weight	<p>Product dimensions, base routers (part numbers CISCO866VAE and CISCO867VAE):</p> <ul style="list-style-type: none"> ● H x W x D = 1.75 x 9.5 x 9.0 in. (3.85 x 20.9 x 19.8 cm), 1 rack unit (1 RU) <p>Product dimensions, secure routers (CISCO866VAE-K9 and CISCO867VAE-K9):</p> <ul style="list-style-type: none"> ● H x W x D = 1.75 x 9.5 x 9.0 in. (3.85 x 20.9 x 19.8 cm), 1 RU ● Weight: 5.5 lb (2.5 kg) maximum
Power	<p>Product power specifications:</p> <ul style="list-style-type: none"> ● AC input voltage: 100 to 240 VAC ● Frequency: 50 to 60 Hz ● Maximum output power: 60W ● Output voltages: 12 VDC
Approvals and compliance	<p>Emissions:</p> <ul style="list-style-type: none"> ● 47 CFR Part 15: 2006 ● CISPR22: 2005 ● EN300386: V1.3.3: 2005 ● EN55022: 2006 ● EN61000-3-2: 2000 [Inc amd 1 and 2] ● EN61000-3-3: 1995 [+ amd 1: 2001] ● ICES-003 Issue 4: 2004 ● KN 22: 2005 ● VCCI: V-3/2006.04 <p>Immunity:</p> <ul style="list-style-type: none"> ● CISPR24: 1997 [+ amd 1 and 2] ● EN55024: 1998 [+ amd 1 and 2] ● EN61000: 4-3, 4-6 ● AS/NZS 3548 ● CFR 47 Part 15 Class B ● EN55022 Class B
Environmental operating range	<ul style="list-style-type: none"> ● Nonoperating temperature: -4 to 149°F (-20 to 65°C) ● Nonoperating humidity: 5 to 95% relative humidity (noncondensing) ● Nonoperating altitude: 0 to 15,000 ft (0 to 4570m) ● Operating temperature <ul style="list-style-type: none"> ◦ At sea level: 32 to 104°F (0 to 40°C) ◦ Up 10,000 ft: 32 to 77°F (0 to 25°C) ◦ Derating 2.7°F/10,000 ft (1.5°C/1000 ft) ● Operating humidity: 10 to 85% relative humidity (noncondensing) ● Operating altitude: 0 to 10,000 ft (0 to 3000m)

DSL Specifications

Tables 8 through 11 list the DSL feature specifications and DSLAM interoperability support for the Cisco 860VAE Series Routers. For more information and details about DSLAM and line-card interoperability, please refer to the following document: [What Is Cisco ISR and ISR G2 xDSL Interoperability?](#)

The Cisco 860VAE Series interoperability should be on par with the Cisco 880VA Series ISRs.

Table 8. DSL Feature Specifications

DSL Specifications	
Multimode DSL (VDSL2 and ADSL2 and 2+)	<ul style="list-style-type: none"> • Broadcom chipset • Dying gasp • IEEE 802.1q VLAN tagging <p>VDSL2:</p> <ul style="list-style-type: none"> • ITU G.993.2 (VDSL2) • 997 and 998 band plans • VDSL2 profiles: 8a, 8b, 8c, 8d, 12a, 12b, and 17a • U0 band support (25–276 kHz) • Ethernet PTM mode only based on IEEE 802.3ah 64/65 octet encapsulation • DELT diagnostics mode <p>ADSL2/2+:</p> <ul style="list-style-type: none"> • ADSL over basic telephone service with Annex A and ISDN Annex B ITU G. 992.1 (ADSL), G.992.3 (ADSL2), and G.992.5 (ADSL2+) • ADSL2+ over basic telephone service Annex M (for extended upstream bandwidth) for G.992.3 (ADSL2) and G.992.5 (ADSL2+) <p>Note: Annex M performance is not optimal over Annex A SKUs.</p> <ul style="list-style-type: none"> • G.994.1 ITU G.hs Handshake Protocol • Reach-extended ADSL2 (G.922.3) Annex L for increased performance on loop lengths greater than 16,000 feet from central office • T1.413 ANSI ADSL DMT issue 2 • DSL Forum TR-067 and TR-100 performance compliant • Impulse Noise Protection (INP) with Extended Framing Parameters • Downstream Power Back Off (DPBO) • Fixed Firmware solution for General deployments. No ability to upgrade the Firmware on the 860VAE models (applicable to all non-Wifi models)

Table 9. VDSL2 over ISDN and Basic Telephone Service DSLAM Interoperability for Cisco 866VAE and Cisco 867VAE

DSLAM	VDSL2 over ISDN and Basic Telephone Service Line-Card Chipset
ZTE 9806	Broadcom
Alcatel ISAM 7302	Ikanos
Alcatel ISAM 7302	Conexant
Huawei 5603	Broadcom

Table 10. ADSL over ISDN DSLAM Interoperability for Cisco 866VAE

DSLAM	ADSL2/2+ over ISDN Line-Card Chipset
Alcatel ASAM 7300	Broadcom
ECI Hi-Focus 480	Infineon
Ericsson ECN320	Broadcom
Siemens HiX 5300	Infineon

Table 11. ADSL over Basic Telephone Service DSLAM Interoperability for Cisco 867VAE

DSLAM	ADSL2/2+ over Basic Telephone Service Line-Card Chipset
Alcatel ASAM 7300	Broadcom
Alcatel ISAM 7302	Broadcom
Ericsson EDA2.1	Broadcom
ECI Hi-Focus 480	Infineon
Fujitsu FDX Hub 1000	Infineon
Fujitsu FDX Hub 1000	Texas Instruments
Huawei MA5600	Conexant
Lucent Stinger	Conexant
Nokia D500	Globespan

Ordering Information

Table 12 lists ordering information for the Cisco 860VAE Series. To place an order, visit the [Cisco ordering homepage](#) and refer to Table 12.

Table 12. Cisco 860VAE Series ISRs Ordering Information

Part Number	Product Name
Multimode DSL (VDSL2 and ADSL2/2+)	
CISCO866VAE	Cisco 866VAE Base Routers with VDSL2/ADSL2+ over ISDN
CISCO866VAE-K9	Cisco 866VAE Secure Routers with VDSL2/ADSL2+ over ISDN
C866VAE-W-E-K9	Cisco 866VAE Secure Wireless Routers with VDSL2/ADSL2+ over ISDN with 802.11n 2.4 GHz, ETSI compliant
CISCO867VAE	Cisco 867VAE Base Router with VDSL2/ADSL2+ over basic telephone service
CISCO867VAE-K9	Cisco 867VAE Secure Router with VDSL2/ADSL2+ over basic telephone service
C867VAE-W-E-K9	Cisco 867VAE Secure Wireless Router with VDSL2/ADSL2+ over basic telephone service with 802.11m 2.4G Hz, ETSI compliant
C867VAE-W-A-K9	Cisco 867VAE Secure Wireless Router with VDSL2/ADSL2+ over basic telephone service with 802.11m 2.4G Hz, FCC compliant
C867VAE-POE-W-A-K9	Cisco 867VAE Secure Wireless Router with VDSL2/ADSL2+ over basic telephone service with 802.11m 2.4G Hz, FCC with PoE
Cisco IOS Software for Cisco 860VAE	
S860ASK9 c860vae-advsecurityk9-mz	Cisco 860VAE Series IOS Advanced Security only for 860VAE Secure Router
S860ASNK9 c860vae-advsecurityk9_npe-mz	Cisco 860VAE Series IOS Advanced Security with No Payload Encryption only for 860VAE Secure Router
S860IPBK9 c860vae-ipbasek9-mz	Cisco 860VAE Series IOS IP Base only for 860VAE Base Routers
S860WAK9 c860vae-advsecurityk9-mz	Cisco 860VAE Series IOS Advanced Security only for 860VAE Secure Wireless Router
S860WANK9 C860vae-advsecurityk9-mz	Cisco 860VAE Series IOS Advanced Security with No Payload Encryption only for 860VAE Secure Wireless Router

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