Cisco 5915 Embedded Services Router

The Cisco® 5900 Series Embedded Services Routers (ESRs) are optimized for mobile and embedded networks that require IP routing and services. The flexible, compact form factor of the Cisco 5900 ESRs, complemented by Cisco IOS® Software and Cisco Mobile Ready Net capabilities, provide highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links.

The Cisco 5915 ESR is a high-performance, ruggedized router designed for use in harsh environments—offering reliable operation in extreme temperatures and under shock and vibration conditions typical for mobile applications in rugged terrain. With onboard hardware encryption, the Cisco 5915 ESR offloads encryption processing from the routing engine to provide highly secure yet scalable video, voice, and data services for mobile and embedded outdoor networks. The router offers high performance, five Fast Ethernet interfaces (two routed and three switched), and a rich Cisco IOS Software feature set, providing investment protection for customers deploying bandwidth-intensive applications in mobile or embedded networks in heavy industrial, public safety, transportation, defense, and energy markets.

The Cisco 5915 ESR is a standards-based PCI-104 router and switch card that is available in both air- and conduction-cooled models. At only 96 x 101 mm (roughly 3.775 x 4 inches), the Cisco 5915 ESR solves critical size, weight, power, price, performance, and cooling challenges. The card is designed as a replacement for the Cisco 3200 Series Mobile Access Router. Cisco has an ecosystem of partners and systems integrators that embed Cisco 5915 ESRs into industry-standard, commercially available enclosures and custom enclosures, tailored to the unique environments in which these routers are deployed. Figures 1 and 2 show the Cisco 5915 ESR air- and conduction-cooled models, respectively.

Figure 1. Cisco 5915 ESR—Air-Cooled Model

Figure 2. Cisco 5915 ESR—Conduction-Cooled Model

Applications

You can use the Cisco 5915 ESR in a variety of applications, discussed in the following sections.

Mobile Networks

The Cisco 5915 ESR provides remote and mobile connectivity, securely extending enterprise network resources to heavy industrial, public safety, transportation, and defense markets. These highly scalable solutions establish mobile networks for small remote sites, heavy industrial vehicles, first-responder vehicles, armored vehicles, and passenger and freight rail trains.

To ensure transparent connectivity to the roaming vehicle network, Cisco has integrated standards-based Mobile IP software into the Cisco IOS Software running on the Cisco 5915 ESR. Mobile IP allows transparent roaming over multiple wireless networks. For mission-critical mobile communications, you can deploy the Cisco 5915 ESR with the capability to take advantage of the Cisco Mobile Ready Net, with the following features:

- Access to mission-critical information: Transparent access and transfer of voice, data, and video information
- Infrastructure-less networking: Reaching beyond the range of a fixed network
- Self-forming temporary ability: Immediate connection with no preconfiguration of peers required; no need for connectivity to the centralized network

Embedded Networks

The Cisco 5915 ESR extends IP networks to outdoor locations when integrated into environmentally hardened enclosures or other outdoor infrastructures, enabling systems integrators to offer custom solutions tailored to meet their customers' needs. Systems integrators also can embed the Cisco 5915 ESR into existing outdoor infrastructure such as border security systems to tie remote networks into a manageable, highly secure IP network. For example, the Cisco 5915 ESR provides a high-performance router for aggregating peripheral devices onto an IP network, including video surveillance cameras and chemical sensors.

On-Demand Network Connectivity

In disaster situations, regular network connectivity is often not available because of damaged network infrastructure or the lack of network capacity. In these situations, the Cisco 5915 ESR provides on-demand network connectivity for homeland-security and emergency-response applications. Government response teams and tactical military teams must have a versatile network platform with the following characteristics:

- High performance in a small form factor
- Portability
- Low power consumption
- Ability to handle harsh environments
- Sophisticated networking capabilities such as quality of service (QoS) to ensure the most important data gets through when links are degraded
- Security to protect the network and the data transmitted over the network
- Remote voice services with Cisco Unified Communications Manager Express (Cisco Unified CME)
- Streaming multicast video support

The Cisco 5915 ESR offers this versatility based on industry standards that take advantage of the rich ecosystem of complementary systems and products.

Key Features and Benefits

Table 1 lists the features and benefits of the Cisco 5915 ESR.

Table 1. Features and Benefits of Cisco 5915 ESR

Feature	Benefit
Cisco Mobile Ready Net	You can deploy the Cisco 5915 in mission-critical mobile communications to provide: • Transparent access of mission-critical voice, video, or data information • Infrastructure-less networking: Reaching beyond the range of a fixed network • Self-forming temporary ability: Immediate connection with no preconfiguration of peers required, eliminating the need for connectivity to the centralized network
Cisco Unified Communications Manager Express support	This application supports up to 48 phones for remote IP telephony on vehicles or in outdoor locations. It provides primary or backup telephony services for command-and-control communications.
Fast Ethernet interface support	The Cisco 5915 ESR provides two routed and three switched high-speed Fast Ethernet interfaces, enabling the router to serve as an aggregation point for on-demand network connectivity in mobile or fixed deployments.
Onboard hardware acceleration	The onboard hardware encryption module offloads packet encryption and decryption from the routing engine to increase router performance.
Flexible integration into solutions	• The inclusive and compact design of the Cisco 5915 ESR simplifies integration. The internal edge finger design for data transfer allows integrators to design smaller and more integrated solutions. • Air- and conduction-cooled models are available to satisfy diverse operational environments. • Designed as a replacement for the Cisco 3200 Series Mobile Access Router, the Cisco 5915 ESR allows for accelerated time to market. • The router provides for development of solutions that address size, weight, power, price, performance, and cooling requirements.
Standards-based PCI-104	A rich ecosystem of existing complementary products exists to facilitate the development of new systems incorporating the Cisco 5915 ESR.

Product Specifications

Tables 2 through 4 list hardware, software, and dimensional specifications for the Cisco 5915 ESR.

Table 2. Hardware Specifications for Cisco 5915 ESR

Cisco 5915 Features	Feature Description
Hardware encryption	Support for the following security protocols: • Onboard hardware encryption processor supporting IP Security (IPsec) • Secure Sockets Layer with transparent LAN services (SSL/TLS) • Secure Real-time Transport Protocol (SRTP) • Triple Digital Encryption Standard (3DES) • Advanced Encryption Standard (AES) • Internet Key Exchange (IKE)
Memory	
DRAM	512 MB
Flash memory	256 MB
Interface Support	
Fast Ethernet	Five 10/100 Fast Ethernet ports (two routed and three switched) supporting autonegotiation
Router console port	One RS-232 console port supporting modem flow-control signaling
LEDs	LED signals provided on edge finger pins

Cisco 5915 Features	Feature Description
Environmental	
Industrial-grade board component temperature	–40 to +185°F (–40 to +85°C) component local ambient temperature ranges
Operating temperature	• The conduction-cooled router can withstand extended temperature ranges of –40 to +185ºF (–40 to +85ºC). • The air-cooled router can withstand extended temperature ranges of –40 to +158ºF (–40 to +70ºC). • Temperature ranges for completed solutions depend on hardware configuration variables, including enclosures and third-party components.
Nonoperating temperature	• –60 to +185ºF (–51 to +85ºC) for both the air- and conduction-cooled boards
Altitude (low-pressure operation)	• Up to 15,000 ft (4500m) for both the air- and conduction-cooled boards

Table 3.   Software Specifications for Cisco 5915 ESR

Features	Feature Description	Cisco IOS Software Image Support	
		Enterprise Base	Advanced Enterprise
Cisco IOS Service Advertisement Framework (SAF)	As the variety and number of network services grows, providing timely and reliable awareness of these services starts to play a more significant role in increasing productivity and efficiency. As networks grow, so too do the services that the devices on these networks offer. Protocols responsible for the service advertisement need to scale to handle this increased load. Cisco IOS SAF provides this function.		X
MLD Proxy	MLD Proxy enables a device to learn multicast proxy group membership information, and simply forward multicast packets based upon that information.		X
Routing protocols	• Routing Information Protocol (RIP) • RIPv2 • Open Shortest Path First (OSPF) • Enhanced Interior Gateway Routing Protocol (EIGRP)-IP • Border Gateway Protocol (BGP) • Cisco Discovery Protocol • IP Policy Routing • IP Multicast Protocol Independent Multicast (PIM) Versions 1 and 2 • Internet Group Management Protocol (IGMP) Versions 1 and 2 • IP Multicast Load Splitting • Cisco Group Management Protocol (GMP)	X	X
VLANs	Up to 32 VLANs supported per router	X	X
IPv4	IPv4 support	X	X
IPv6	• IPv6 routing and Cisco Express Forwarding switching • IPv6 QoS • IPv6 tunneling support • Cisco IOS Zone-Based Firewall for IPv6 traffic		X
Encapsulations	• Point-to-Point Protocol (PPP) • PPP over Ethernet (PPPoE) client and server for Fast Ethernet • 802.1q VLAN trunking support • Generic routing encapsulation (GRE)	X	X
Additional protocol support	• Telnet • Asynchronous tunneling • Real-time Transport Protocol (RTP) header compression	X	X
	Secure Shell (SSH) Protocol Client and Server Version 2		X

Features	Feature Description	Cisco IOS Software Image Support	
		Enterprise Base	Advanced Enterprise
Mobility			
Radio-aware routing	• Optimizes IP routing over fixed or temporary radio networks • Factors radio link metrics into route calculations • Immediately recognizes and adapts to changes in network neighbor status • Dynamic Link Exchange Protocol (DLEP) • Router Radio Control Protocol (R2CP) • RFC 5578 (authored by Cisco)		X
Mobile Ad Hoc Networks	• OSPFv3 enhancements for mobile temporary networks		X
Mobile IP	Mobile IP and Cisco Mobile Networks in Cisco IOS Software • Home agent and mobile router redundancy • Mobile router preferred interfaces • Mobile router reverse tunneling • Mobile router asymmetric links • Mobile router static and dynamic networks • Static co-located care-of address • Authentication, authorization, and accounting (AAA) server • Cisco Mobile Networks Network Address Translation (NAT) Traversal over Mobile IP • Support for Mobile IP tunnel templates, allowing configuration of IP Multicast and IPsec on Mobile IP tunnels • Mobile IP foreign agent local routing optimization		X
Security			
Suite-B support	Suite-B support in Cisco IOS Software cryptography, including Suite-B-GCM-128, Suite-B-GCM-256, Suite-B-GMAC-128, and Suite-B-GMAC-256 as described in RFC-4869		X
Authentication	• Route and router authentication • Password Authentication Protocol (PAP) • Challenge Handshake Authentication Protocol (CHAP) • Microsoft CHAP (MS-CHAP) local password • IP basic and extended access lists • Time-based access control lists (ACLs)	X	X
Secure connectivity	Secure collaborative communications with Group Encrypted Transport VPN, Dynamic Multipoint VPN (DMVPN), or Enhanced Easy VPN		X
Integrated threat control	Responding to sophisticated network attacks and threats using Cisco IOS Firewall, Cisco IOS Zone-Based Firewall, Cisco IOS IPS, Cisco IOS Content Filtering, and Cisco IOS Flexible Packet Matching (FPM)		X
Identity management	Intelligently protecting endpoints using technologies such as AAA and public key infrastructure (PKI)		X
Security protocols	• IPsec • SSL/TLS • SRTP • 3DES • AES • IKE		X

Features	Feature Description	Cisco IOS Software Image Support	
		Enterprise Base	Advanced Enterprise
QoS			
Traffic management	• QoS • Generic traffic shaping • Class-based Ethernet matching and mobile access routing (802.1p class of service [CoS]) • Committed access rate • Flow-based Weighted Random Early Detection (WRED) • Class-Based Weighted Fair Queuing (CBWFQ) • Low Latency Queuing (LLQ) • Priority Queuing • Weighted Fair Queuing (WFQ) • Link fragmentation and interleaving (LFI) • Traffic Policing Resource Reservation Protocol (RSVP)	X	X
Voice			
Unified communications	Cisco Unified Communications Manager Express • With support for up to 48 phones		X
Management			
Management services	• Simple Network Management Protocol (SNMP) Versions 2 and 3 • Telnet • Console port • RADIUS • TACACS+ • Cisco Service Assurance Agent • Syslog • Response Time Reporter • Network Time Protocol (NTP) Client • Trivial File Transfer Protocol (TFTP) Client and Server • Dynamic Host Configuration Protocol (DHCP) Client and Server • DHCP Relay • Hot Standby Router Protocol (HSRP)	X	X
Tool Command Language (Tcl) scripts	Tcl script support	X	X
Address conservation	• NAT Many-to-One (Port Address Translation [PAT]) • NAT Many-to-Many (Multi-NAT) • DHCP Client Address Negotiation • Easy IP Phase I	X	X

Table 4.   Dimensions of Cisco 5915 ESR

Feature	Feature Description
Card dimensions	Router module physical dimensions: • Industry-standard PCI-104 3.775 x 4 in. (96 x 101 mm)

Ordering Information

To place an order, visit the Cisco Ordering Home Page and refer to Table 5.

Table 5.   Ordering Information for Cisco 5915 ESR

Product Name	Part Number
Cisco 5915 ESR Cards	
Cisco 5915 ESR air-cooled card with 2 Fast Ethernet routed ports, 3 Fast Ethernet switched ports and 1 console port.	CISCO5915RA-K9
Cisco 5915 ESR conduction-cooled card with 2 Fast Ethernet routed ports, 3 Fast Ethernet switched ports and 1 console port.	CISCO5915RC-K9
Cisco 5915 IOS Software	
Cisco 5915 Enterprise Base Cisco IOS Software–15.2(1)GC	S591EBK9-15201GC
Cisco 5915 Advanced Enterprise Cisco IOS Software–15x(yy)GC	S591AESK9-15201GC

To Download the Software

Visit the Cisco Software Center to download Cisco IOS Software. A Cisco.com account is required to access this website. Table 6 lists the Cisco IOS Software images available for the Cisco 5915 ESR.

Table 6.   Cisco IOS Software Images for Cisco 5915 ESR

Cisco IOS Software Image Name Description
C5915-entbase-mz Cisco 5915 Enterprise Base Cisco IOS Software image
C5915-adventerprisek9-mz Cisco 5915 Advanced Enterprise Cisco IOS Software image

Service and Support

Realize the full business value of your technology investments with smart, personalized services from Cisco and our partners.

Backed by deep networking expertise and a broad ecosystem of partners, Cisco Services enable you to successfully plan, build, and run your network as a powerful business platform.

Whether you are looking to quickly seize new opportunities to meet rising customer expectations, improve operational efficiency to lower costs, mitigate risk, or accelerate growth, we have a service that can help you.

For more information about Cisco services, refer to Cisco Technical Support Services or Cisco Advanced Services.

For More Information

For more information about the Cisco 5915 Embedded Services Router, visit http://www.cisco.com/go/5900 or contact your local Cisco account representative.

For more information about Cisco Mobile Ready Net, visit https://www.cisco.com/web/strategy/government/defense_adhocmobility.html or contact your local Cisco account representative.