Cisco 5921 Embedded Services Router

The Cisco® 5921 Embedded Services Router (ESR) is a Cisco IOS software router application. It is designed to operate on small, low-power, Linux-based platforms to extend the use of Cisco IOS® Software into extremely mobile and portable communications systems. You can use the Cisco 5921 ESR in a variety of applications.

The Cisco 5921 ESR is part of the Cisco 5900 Series ESRs, all optimized for mobile and embedded networks that require IP routing and services. The flexible, compact form factor of the Cisco 5900 routers, complemented by Cisco IOS Software and Cisco Mobile Ready Net capabilities, provides highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links.

Low-Cost Vehicle Communications Systems

The Cisco 5921 ESR complements the Cisco 5915 and 5940 ESR hardware routers, providing integrators with a cost-effective solution for addressing smaller, highly-integrated applications. The Cisco 5921 ESR can be combined with system-specific applications onto a single, small, low-power hardware solution.

Portable Communications Devices

By not restricting the product developer to a specified form factor, the Cisco 5921 ESR offers integrators creative flexibility to design hardware to meet unique market requirements. The router targets low-power systems, making it ideal for use in portable, battery-powered devices.

Sensors

The Cisco 5921 ESR's network optimization capabilities support the development of security-protected sensors deployed in self-forming, self-healing, infrastructure-less networks. It provides immediate connection with no pre-configuration of peers required; no need for connectivity to a centralized network; and reach beyond the range of a fixed network.

Key Features and Benefits

The Cisco 5921 ESR is part of the Cisco Internet of Things (IoT) portfolio, designed to create a highly secure, simple, and reliable network. It can enable connections to devices, applications, and people in a way that reduces disruption while adding value to each connected service.

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Table 1 outlines the features and benefits of the Cisco 5921 ESR. Table 2 outlines the product's software specifications. Table 3 highlights the router's platform specifications.

Table 1. Features and Benefits of Cisco 5921 ESR

Feature	Benefit
Cisco Mobile Ready Net	Deploy the Cisco 5921 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 pre-configuration of peers required, eliminating the need for connectivity to a centralized network
Platform Support	Operate on a broad range of commonly available, low-power hardware platforms offer integrators significant flexibility
Network Optimization	The following technologies optimize the utilization of limited bandwidth links, increasing network connectivity and improving user experience: • IP Multiplexing - fully utilize available bandwidth by optimizing transmission packet size • QoS - help ensure the highest priority data is transmitted when link conditions degrade • Radio-aware routing - actively monitor link conditions to increase connectivity and reduce packet loss • Ad-hoc networking - dynamically configure networks to allow authorized nodes to move without requiring manual intervention or pre-configuration
Network Security	Protect against malicious attacks and unauthorized access with advanced security technologies such as authentication, identity management, security protocols, secure connectivity, and integrated threat management
Cisco IOS Embedded Event Manager (EEM)	Cisco IOS EEM is a distributed and customized approach to event detection and recovery offered directly in a Cisco IOS Software device. It offers the ability to monitor events and take informational, corrective, or any desired EEM action when the monitored events occur or when a threshold is reached

Product Specifications

Table 2. Software Specifications for Cisco 5921 ESR

Features	Feature Description
Cisco Service Advertisement Framework (SAF)	The Cisco SAF is a dynamic, ready-to-use communications framework for network applications that allows servers and clients to advertise, discover, and select services. Network-based SAF distributes information by taking advantage of IP routing technologies. SAF offers customers greater scalability, availability, and flexibility to deploy and manage applications across the enterprise. It: • Provides real-time service advertisement, discovery, presence, and selection • Reduces ongoing operational costs by eliminating manual configuration • Reduces services deployment time to realize faster ROI • Improves business continuity, avoiding potentially costly network downtime
Cisco IP Multiplexing	Cisco IP Multiplexing improves bandwidth efficiency over a packets-per-second (pps)-constrained link by using multiplexing schemes to combine small IP packets from a single stream, or multiple streams, into a large packet. It then sends this large packet over the pps-constrained link. Benefits include: • Increased bandwidth efficiency on pps-constrained lines (for example, satellite) • Potential savings in processing load for IP security (IPsec)-encrypted traffic • No manipulation of voice stream; codec quality is maintained • Application-agnostic implementation • No need to duplicate dial plans or deal with complex call routing • Ability to multiplex any IP packet, not just voice over IP (VoIP); other targets include video and other small User Datagram Protocol (UDP) streams
Cisco Unified Communications Manager Express (CME) Support	This feature supports up to 20 phones for remote IP telephony on vehicles and for other command-and-control communications.
Multicast Listener Discovery (MLD) Proxy	MLD Proxy enables a device to learn proxy group membership information and simply forward multicast packets based upon that information.
Routing Protocols	• Routing Information Protocol (RIP) Versions 1 and 2 • Open Shortest Path First (OSPF) • Enhanced Interior Gateway Routing Protocol (EIGRP)-IP • Border Gateway Protocol (BGP) • Cisco Discovery Protocol • IP Policy Routing

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Features	Feature Description
	• IP Multicast Protocol Independent Multicast (PIM) Versions 1 and 2 • Internet Group Management Protocol (IGMP) Versions 1, 2, and 3 • IP Multicast Load Splitting • Cisco Group Management Protocol (GMP)
Virtual LANs (VLANS)	Up to 32 VLANs supported per router
IPv4	IPv4 support
IPv6	• IPv6 routing and Cisco Express Forwarding switching • IPv6 QoS • IPv6 tunneling support • Cisco IOS Zone-Based Firewall for IPv6 traffic
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)
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 • Supports Dynamic Link Exchange Protocol (DLEP) • Supports Router Radio Control Protocol (R2CP) • Supports RFC 5578 (authored by Cisco)
Mobile Ad-Hoc Networks	• OSPFv3 enhancements for mobile ad-hoc networks
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
Next-Generation Encryption	Next-Generation Encryption 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
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)
Secure Connectivity	Secure collaborative communications with Group Encrypted Transport VPN, Dynamic Multipoint VPN (DMVPN), or Enhanced Easy VPN
Integrated Threat Control	Responds to sophisticated network attacks and threats using Cisco IOS Intrusion Prevention System (IPS), Cisco IOS Firewall, Cisco IOS Zone-Based Firewall, Cisco IOS Content Filtering, and Flexible Packet Matching (FPM)
Identity Management	Intelligently protecting endpoints using technologies such as AAA and public key infrastructure (PKI)
Security Protocols	• IPsec • SSL/TLS • 3DES • AES • IKE

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Features	Feature Description
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) • Traffic Policing Resource Reservation Protocol (RSVP)
Management Services	• Simple Network Management Protocol (SNMP) Versions 2 and 3 • Telnet • RADIUS • TACACS+ • Cisco Service Assurance Agent • Syslog • Response Time Reporter • Trivial File Transfer Protocol (TFTP) client and server • Dynamic Host Configuration Protocol (DHCP) client and server • DHCP relay • Secure Shell (SSH) Protocol Client and Server Version 2.0
Tool Command Language (Tcl) Scripts	Tcl script support
Address Conservation	• NAT Many-to-One (Port Address Translation [PAT]) • NAT Many-to-Many (Multi-NAT) • DHCP Client Address Negotiation • Easy IP Phase I

Table 3. Platform Specifications for Cisco 5921 ESR

Features	Feature Description
Processor	• x86 - e.g., Intel Atom and Intel Core i3/i5/i7
Memory	• 512 MB minimum
Disk Space	• 300 MB minimum
Operating System	• glibc compiled Linux

Ordering Information

The Cisco 5921 ESR is currently limited to authorized partners and applications only. To see if your application qualifies, contact your local Cisco representative.

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 can 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.

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For More Information

For more information about the Cisco 5921 Embedded Services Router, contact your local Cisco account representative.

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