GOBIERNO DE PUERTO RICO
ADMINISTRACIÓN DE SERVICIOS GENERALES

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21 de junio de 2011

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ANALISIS DE LOS CAMBIOS PRESENTADOS POR SESCO TECHNOLOGY SOLUTIONS PARA EL CONTRATO 72-230 PARA EL RENGLÓN 21.

Conforme a la documentación provista en carpeta por el Sr. David Habibe, Presidente de **SESCO Technology Solutions**, y recibido en la agencia el **16 de junio de 2011** certifico que las especificaciones cambiadas correspondientes al **Renglón 21** en sus **Partida 1, 1A, 1B, 1C, 1D, 3, 3A, 3B, 3C, 3D y 7** cumplen con el requisito de igualar o mejorar la oferta hecha originalmente.

En todos los cambios se cumplió con la necesidad de actualizar los modelos y precios del hardware ofrecidos.

Para más información o aclarar alguna duda, se me puede contactar en el 787-759-7676 extensión 2000.

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RENGLON 21 - ROUTERS

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
Partida 1	**Modular Router**	**Modular Router**	**CISCO 1921 ROUTER**	**$ 850.00**
	Integrated 10/100 Fast Ethernet Port	Integrated 10/100 Fast Ethernet Port		
	VLAN routing support	VLAN routing support		
	1 10/100 port and 2 WAN Interfaces	2 10/100 port and 2 WAN Interfaces		
	Data Compression.	Data Compression.		
	SNMP Manageable.	SNMP Manageable.		
	TCP/IPX Software Support	TCP/IPX Software Support		
	3 Year 8X5XNBD On site service	4 Year 8X5XNBD On site service		$ 455.00
		Security Feature Bundle Set		$ 695.00
	Modules:	Modules:		
Partida 1A	1 port ISDN BRI/ NT1 WAN Interface card	2 port ISDN BRI/ NT1 WAN Interface card.	CISCO 1 port ISDN BRI/ NT1 WAN Interface card (P/N WIC-1B-U) - $550.00	
Partida 1B	2 Port serial Interface Card for Item. 1.	3 Port serial Interface Card for Item. 1.	CISCO 2 Port serial Interface Card for Item (P/N WIC-2T) - $550.00	
Partida 1C	1 Port, 4 Wire, 56KPS DSU/CSU WAN int	2 Port, 4 Wire, 56KPS DSU/CSU WAN inte	CISCO 1 Port, 4 Wire, 56KPS DSU/CSU WAN interface Card (P/N WIC-1DSU-56K4)	$ 550.00
Partida 1D	1 Port Fractional T1 DSU/CSU WAN Inter	2 Port Fractional T1 DSU/CSU WAN Interf	CISCO 1 Port Fractional T1 DSU/CSU WAN Interface Card (P/N WIC-1DSU-T1)	$ 750.00
Partida 3	**Modular Router**	**Modular Router**	**CISCO 2921 ROUTER**	**$ 2,200.00**
	Integrated 10/100 Fast Ethernet Port	Integrated 10/100 Fast Ethernet Port		

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RENGLON 21 - ROUTERS

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	VLAN routing support	VLAN routing support		
	2 10/100 port and 2 or up WAN Interfaces	3 10/100 port and 2 or up WAN Interfaces.		
	Nagged VPN, Support and Internet DSL I	Nagged VPN, Support and Internet DSL In		
	TCP/IPX Software Support	TCP/IPX Software Support		
	3 Year 8X5XNBD On site service	4 Year 8X5XNBD On site service		$ 1,110.00
		Security Feature Bundle Set		$ 695.00
		VoIP Feature Bundle Set		$ 695.00
	Modules:	Modules:		
Partida 3A	1 port ISDN BRI/ NT1 WAN Interface card	2 port ISDN BRI/ NT1 WAN Interface card	CISCO 1 port ISDN BRI/ NT1 WAN Interface card (P/N WIC-1B-U)	$ 550.00
Partida 3B	2 Port serial Interface Card for Item. 3.	3 Port serial Interface Card for Item. 3.	CISCO 2 Port serial Interface Card for Item (P/N WIC-2T)	$ 550.00
Partida 3C	1 Port, 4 Wire, 56KPS DSU/CSU WAN int	2 Port, 4 Wire, 56KPS DSU/CSU WAN inte	CISCO 1 Port, 4 Wire, 56KPS DSU/CSU WAN interface Card (P/N WIC-1DSU-56K4)	$ 550.00
Partida 3D	1 Port Fractional T1 DSU/CSU WAN Inter	2 Port Fractional T1 DSU/CSU WAN Interf	CISCO 1 Port Fractional T1 DSU/CSU WAN Interface Card (P/N WIC-1DSU-T1)	$ 750.00
Partida 7	**Modular ACCESS Router, support for f**	**Modular ACCESS Router, support for fo**	**CISCO 2901 ROUTER - $1,135.00**	**$ 1,135.00**
	VPN Capability OPSEC, DES and 3DES E	VPN Capability OPSEC, DES and 3DES Encryption.		
	TCP/IPX Software Support	TCP/IPX Software Support		

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RENGLON 21 - ROUTERS

Renglón, Partida	Especificación Técnica Vigente	Especificación Técnica Propuesta	Modelo Propuesto	Precio Propuesto
	3 Year 8X5XNBD On site service	4 Year 8X5XNBD On site service		$ 470.00
		Security Feature Bundle Set		$ 695.00
		VoIP Feature Bundle Set		$ 695.00

Nota: Deberán entregar literatura técnica y disco compacto con la información provista de las tablas Excel.

Aprobado por:

Fecha de recibo

Firma del Jefe de la Agencia o su Representante Autorizado

Cisco 1921 Series Integrated Services Routers

Product names: CISCO1921/K9, CISCO1921-SEC/K9

Cisco® 1900 Series Integrated Services Routers build on 25 years of Cisco innovation and product leadership. The new platforms are architected to enable the next phase of branch-office evolution, providing rich-media collaboration to the branch office while maximizing operational cost savings. The Cisco Integrated Services Routers Generation 2 (ISR G2) platforms are future-enabled with multicore CPUs, Gigabit Ethernet switching with enhanced Power over Ethernet (PoE), and new energy monitoring and control capabilities that enhance overall system performance. Additionally, a new Cisco IOS® Software Universal image enables you to decouple the deployment of hardware and software, providing a stable technology foundation that can quickly adapt to evolving network requirements. Overall, the Cisco 1900 Series offers exceptional total cost of ownership (TCO) savings and network agility through the intelligent integration of market-leading security, unified communications, wireless, and application services.

Product Overview

The Cisco 1921 builds on the best-in-class offering of the Cisco 1841 Integrated Services Routers. All Cisco 1900 Series Integrated Services Routers offer embedded hardware encryption acceleration, optional firewall, intrusion prevention, and advanced security services. In addition, the platforms support the industry's widest range of wired and wireless connectivity options such as Serial, T1/E1, xDSL, Gigabit Ethernet, and third-generation (3G) wireless (Figure 1)

Figure 1. Cisco 1921 Integrated Services Router

Key Business Benefits

Cisco ISR G2 routers provide superior services integration and agility. Designed for scalability, the modular architecture of these platforms enables you to grow and adapt with your business needs. Table 1 lists the business benefits of the Cisco 1900.

Table 1. Key features and benefits of the Cisco 1921 Integrated Services Router

Benefits	Description
Service integration	• The Cisco 1921 offers increased levels of services integration with data, security, wireless, and mobility services, enabling greater efficiencies and cost savings.
Services on demand	• A single Cisco IOS Software Universal image is installed on each ISR G2. The Universal image contains *all* of the Cisco IOS Software technology sets that can be activated with a software license allowing your business to quickly deploy advanced features without downloading a new Cisco IOSSoftware image. Additionally, larger default memory is included to support the new capabilities.
High performance with integrated services	• The Cisco 1900 Series enables deployment in high-speed WAN environments with concurrent services enabled up to 15 Mbps.
Network agility	• Designed to address customer business requirements, the Cisco 1921 with the modular architecture offers a performance range of modular interfaces and services as your network needs grow. • Modular interfaces offer increased bandwidth, a diversity of connection options, and network resiliency.

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Benefits	Description
Energy efficiency	• The Cisco 1921 architecture provides energy-savings features that include the following: • The Cisco 1900 Series offers intelligent power management and allows you to control power to the modules based on the time of day. Cisco EnergyWise technology will be supported in the future. • Services integration and modularity on a single platform performing multiple functions optimizes raw-materials consumption and energy usage. • Platform flexibility and ongoing development of both hardware and software capabilities lead to a longer product lifecycle, lowering all aspects of the TCO, including materials and energy use. • High-efficiency power supplies are provided with each platform.
Investment protection	• The Cisco 1921 maximizes investment protection by supporting: • Reuse of a broad array of existing modules supported on the original integrated services routers (ISRs) provides a lower TCO. • A rich set of Cisco IOS Software features is carried forward from the original ISRs and delivered in the universal image. • This router gives you the flexibility to grow as your business needs evolve.

Architecture and Modularity

The Cisco 1921 is architected to meet the application demands of today's branch offices with design flexibility for future applications. The modular architecture is designed to support expanding customer requirements, increased bandwidth, and fully integrated power distribution to modules supporting 802.3af PoE and Cisco Enhanced PoE (ePoE). Table 2 lists the architectural features and benefits of the Cisco 1921.

Table 2. Architectural Features and Benefits

Architectural Feature	Benefits
Modular platform	• The Cisco 1921 ISRs are highly modular platforms with multiple module slots to provide connectivity and services for varied branch-office network requirements. • The ISRs offer an industry-leading breadth of LAN and WAN connectivity options through modules to accommodate field upgrades to future technologies without requiring replacement of the platform.
Processors	• The Cisco 1921 is powered by high-performance multicore processors that support growing demands of branch-office networks by supporting high-throughput WAN requirements.
Embedded IP Security/Secure Sockets Layer (IPsec/SSL) VPN hardware acceleration	• Embedded hardware encryption acceleration is enhanced to provide higher scalability, which, combined with an optional Cisco IOS Security license, enables WAN link security and VPN services (Both IPSec and SSL acceleration). • The onboard encryption hardware out-performs the advanced integration modules of previous generations.
Integrated Gigabit Ethernet ports	• All onboard WAN ports are 10/100/1000 Gigabit Ethernet WAN-routed ports.
Innovative universal-serial-bus (USB)-based console access	• A new, innovative, mini-Type B USB console port supports management connectivity when traditional serial ports are not available. • The traditional console and auxiliary ports are also available. You can use either the USB-based console or the RJ-45-based console port to configure the router.
Optional external power supply for distribution of PoE	• An optional upgrade to the power supply provides inline power (802.3af-compliant PoE and Cisco Standard Inline Power to optional integrated switch modules.

Modularity Features and Benefits

The Cisco 1921 provides significantly enhanced modular capabilities (refer to Table 3) that offer you investment protection. Most of the modules available on previous generations of Cisco routers, such as the Cisco 1841 ISR, are supported on the Cisco 1921. Additionally, you can easily interchange modules used on the Cisco 1921 with other Cisco routers to provide maximum investment protection. Taking advantage of common interface cards across a network greatly reduces the complexity of managing inventory requirements, implementing large network rollouts, and maintaining configurations across a variety of branch-office sizes.

A complete list of supported modules is available at http://www.cisco.com/go/1921.

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Table 3. Modularity Features and Benefits

Feature	Benefits
Cisco Enhanced High-Speed WAN Interface Card (EHWIC)	• The EHWIC slot replaces the high-speed WAN interface card (HWIC) slot and can natively support HWICs, WAN interface cards (WICs), and voice/WAN interface cards (VWICs). • Two integrated EHWIC slots are available on the Cisco 1921 for flexible configurations for support of two modules: One doublewide HWIC-D **or** two singlewide EHWIC/HWIC modules are supported. • Each EHWIC slot offers high-data-throughput capability.
USB 2.0 ports	• One high-speed USB 2.0 port is supported. The USB port enables another mechanism for secure-token capabilities and storage.

Cisco IOS Software

The Cisco 1921 Integrated Services Routers deliver innovative technologies running on industry-leading Cisco IOS Software. Developed for wide deployment in the world's most demanding enterprise, access, and service provider networks, Cisco IOS Software Releases 15 M and T support a comprehensive portfolio of Cisco technologies, including new functions and features delivered in Releases 12.4 and 12.4T, and new innovations that span multiple technology areas, including security, high availability, IP Routing and Multicast, quality of service (QoS), IP Mobility, Multiprotocol Label Switching (MPLS), VPNs, and embedded management.

Cisco IOS Software Licensing and Packaging

A single Cisco IOS Universal image encompassing all functions is delivered with the platforms. You can enable advanced features by activating a software license on the Universal image. In previous generations of access routers, these feature sets required you to download a new software image. Technology packages and feature licenses, enabled through the Cisco software licensing infrastructure, simplify software delivery and decrease the operational costs of deploying new features.

Four major technology licenses are available on the Cisco 1921 Integrated Services Routers; you can activate the licenses through the Cisco software activation process identified at http://www.cisco.com/go/sa.

- IP Base: This technology package is available as default
- Data
- Security (SEC) or Security with No Payload Encryption (SEC-NPE)

For additional information and details about Cisco IOS Software licensing and packaging on Cisco 1921 Integrated Services Routers, please visit http://www.cisco.com/go/1921.

Key Branch-Office Services

The industry-leading Cisco Integrated Services Routers offer unprecedented levels of services integration. Designed to meet the requirements of the branch office, these platforms provide a complete solution with security, mobility, and data services. Businesses enjoy the benefit by deploying a single device that meets all their needs and saves on capital and operational expenses.

Integrated Network Security for Data and Mobility

Security is essential to protect a business' intellectual property while also ensuring business continuity and providing the ability to extend the corporate workplace to employees who need anytime, anywhere access to company resources. As part of the architectural framework of the SAFE Blueprint from Cisco that allows organizations to identify, prevent, and adapt to network security threats - the Cisco 1900 Series Integrated Services Routers facilitate secure business transactions and collaboration.

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The Cisco IOS Software Security technology package license for the Cisco 1900 Series offers a wide array of common security features such as advanced application inspection and control, threat protection, and encryption architectures for enabling more scalable and manageable VPN networks in one solution set. The Cisco 1921 offers native hardware-based encryption acceleration to provide greater IPsec throughput with less overhead for the router processor when compared with software-based encryption solutions. Cisco Integrated Services Routers offer a comprehensive and adaptable security solution for branch-office routers that include features such as:

- **Secure connectivity:** Achieve secure collaborative communications with Group Encrypted Transport VPN, Dynamic Multipoint VPN (DMVPN), or Enhanced Easy VPN.
- **Integrated threat control:** Respond to sophisticated network attacks and threats using Cisco IOS Firewall, Cisco IOS Zone-Based Firewall, Cisco IOS IPS,and Cisco IOS Content Filtering and Flexible Packet Matching (FPM).
- **Identity management:** Intelligently protect endpoints using technologies such as authentication, authorization, and accounting (AAA) and public key infrastructure (PKI).

Detailed information about the security features and solutions supported on the Cisco 1900 Series routers is available at http://www.cisco.com/go/routersecurity.

Mobility Services

Wireless WAN

Cisco 3G wireless WAN (WWAN) modules combine traditional enterprise router functions such as remote management, advanced IP services such as voice over IP (VoIP), and security, with mobility capabilities of 3G WAN access. Using high-speed 3G wireless networks, routers can replace or complement existing landline infrastructure, such as dialup, Frame Relay, and ISDN. Cisco 3G solutions support 3G standards High-Speed Packet Access (HSPA) and Evolution Data Only/Evolution Data Optimized (EVDO), **offering** you a true multipath WAN backup and the ability to rapidly deploy primary WAN connectivity. For more information about 3G solutions on Cisco Integrated Services Routers, please visit http://www.cisco.com/go/3g.

Integrated LAN Switching

The Cisco 1921 Integrated Services Router will support the EHWIC LAN modules when they become available in the future. The Cisco 1921 supports the existing singlewide Cisco EtherSwitch® HWIC and the doublewide HWIC-D modules, which greatly expand the capabilities of the router by integrating industry-leading Layer 2 switching.

Managing Your Integrated Services Routers

Network management applications are instrumental in lowering operating expenditures (OpEx) while improving network availability by simplifying and automating many of the day-to-day tasks associated with managing an end-to-end network. "Day-one device support" provides immediate manageability support for the ISR, enabling quick and easy deployment, monitoring, and troubleshooting from Cisco and third-party applications.

Organizations rely on Cisco, third-party, and in-house developed network management applications to achieve their OpEx and productivity goals. Underpinning those applications are the embedded management features available in every ISR. The new ISRs continue a tradition of broad and deep manageability features within the devices. Features such as Cisco IOS IP Service-Level Agreements (IP SLAs), Cisco IOS Embedded Event Manager (EEM), and NetFlow allow you to know what is going on in your network at all times. These features along with Simple Network Management Protocol (SNMP) and syslog support enable your organization's management applications.

Tables 4 through 6 give for details about Cisco IOS Software, network management, and manageability support on Cisco 1921 Integrated Services Routers.

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Table 4. Cisco 1921 with Cisco IOS Software Feature and Protocol High-Level Support

Feature	Description
Protocols	IPv4, IPv6, static routes, Open Shortest Path First (OSPF), Enhanced IGRP (EIGRP), Border Gateway Protocol (BGP), BGP Router Reflector, Intermediate System-to-Intermediate System (IS-IS), Multicast Internet Group Management Protocol (IGMPv3) Protocol Independent Multicast sparse mode (PIM SM), PIM Source-Specific Multicast (SSM), Distance Vector Multicast Routing Protocol (DVMRP), IPsec, generic routing encapsulation (GRE), Bidirectional Forwarding Detection (BVD), IPv4-to-IPv6 Multicast, MPLS, Layer 2 Tunneling Protocol Version 3 (L2TPv3), 802.1ag, 802.3ah, and Layer 2 and Layer 3 VPN
Encapsulations	Ethernet, 802.1q VLAN, Point-to-Point Protocol (PPP), Multilink Point-to-Point Protocol (MLPPP), Frame Relay, Multilink Frame Relay (MLFR) (FR.15 and FR.16), High-Level Data Link Control (HDLC), Serial (RS-232, RS-449, X.21, V.35, and EIA-530), Point-to-Point Protocol over Ethernet (PPPoE), and ATM
Traffic management	QoS, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and Network-Based Advanced Routing (NBAR)

For a more comprehensive list of features supported in Cisco IOS software, refer to the Feature Navigator tool at: http://www.cisco.com/go/fn.

Table 5 highlights several ISR management capabilities that are available within Cisco IOS Software:.

Table 5. Cisco IOS Software Management Capabilities

Feature	Description of Feature Supported by Cisco Integrated Services Routers
WSMA	The Web Services Management Agent (WSMA) defines a mechanism through which you can manage a network device, retrieve configuration data information, and upload and manipulate new configuration data. WSMA uses XML-based data encoding that is transported by the Simple Object Access Protocol (SOAP) for the configuration data and protocol messages.
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.
IPSLA	Cisco IOS IP SLAs enable you to assure new business-critical IP applications, as well as IP services that use data, voice, and video, in an IP network.
SNMP, RMON, Syslog, NetFlow,and TR-069	Cisco 1900 Series Integrated Services Routers also support SNMP, Remote Monitoring (RMON), syslog, NetFlow, and TR-069 in addition to the embedded management features previously mentioned.

Cisco Network Management Applications

The applications listed in Table 6 are standalone products that you can purchase or download to manage your Cisco network devices. The applications are built for the different operational phases; you can select the ones that best fit your needs.

Table 6. Network Management Solutions

Operational Phase	Application	Description
Device staging and configuration	Cisco Configuration Professional	• Cisco Configuration Professional is a GUI device-management tool for Cisco IOS Software-based access routers. This tool simplifies routing, firewall, IPS, VPN, unified communications, and WAN and LAN configuration through GUI-based easy-to-use wizards.
Networkwide deployment, configuration, monitoring, and troubleshooting	CiscoWorks LMS	• CiscoWorks LAN Management Solution (LMS) is a suite of integrated applications for simplifying day-to-day management of a Cisco end-to-end network, lowering OpEx while increasing network availability. CiscoWorks LMS offers network managers an easy-to-use web-based interface for configuring, administering, and troubleshooting the Cisco integrated Services Routers, using new instrumentation such as Cisco IOS EEM. • In addition to supporting basic platform services of the integrated services router, CiscoWorks also provides added-value support for the Cisco Service-Ready Engine, (SRE) enabling the management and distribution of software images to the SRE, thereby reducing the time and complexities associated with image management.
Networkwide staging, configuration, and compliance	CiscoWorks NCM	• CiscoWorks Network Compliance Manager (NCM) tracks and regulates configuration and software changes throughout a multivendor network infrastructure. It provides superior visibility into network changes and can track compliance with a broad variety of regulatory, IT, corporate governance, and technology requirements.
Security staging, configuration, and monitoring	Cisco Security Manager	• Cisco Security Manager is a leading enterprise-class application for managing security. It delivers provisioning of firewall, VPN, and intrusion-prevention-system (IPS) services across Cisco routers, security appliances, and switch service modules. The suite also includes the Cisco Security Monitoring, Analysis and Response System (Cisco Security MARS) for monitoring and mitigation.

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Operational Phase	Application	Description
Configuration and provisioning	Cisco Unified Provisioning Manager	• Cisco Unified Provisioning Manager provides a reliable and scalable web-based solution for managing a company's crucial next-generation communications services. It manages unified communications services in an integrated IP telephony, voicemail, and messaging environment.
Staging, deployment, and changes of licenses	Cisco License Manager	• Easily manage Cisco IOS Software activation and license management for a wide range of Cisco platforms running Cisco IOS Software as well as other operating systems with the secure client-server application Cisco License Manager.
Staging, deployment, and changes to configuration and image files	Cisco Configuration Engine	• Cisco Configuration Engine is a secure network management product that provides zero-touch image and configuration distribution through centralized, template-based management.

Summary and Conclusion

As businesses strive to lower the TCO in running their networks and increase their overall employee productivity with more centralized and collaborative network applications, more intelligent branch-office solutions are required. The Cisco 1921 offers these solutions by providing enhanced performance and increased modular density to support multiple services. The Cisco 1921 is designed to consolidate the functions of separate devices into a single, compact system that can be remotely managed. Table 7 gives specifications of the Cisco 1921.

Product Specifications

Table 7. Product Specifications of Cisco 1921 Integrated Services Router

	Cisco 1921 Integrated Services Router
Services and Slot Density	
Embedded hardware-based cryptography acceleration (IPsec + SSL)	Yes
RJ-45 onboard LAN 10/100/1000 ports	2
EHWIC slots	2
Doublewide EHWIC slots (use of a doublewide EHWIC slot will consume 2 EHWIC slots)	1
Cisco Integrated Services Module (ISM) slots	0
Memory (DDR2 DRAM): Default/Maximum	512 MB/512 MB
USB flash memory (internal): Default/maximum	256 MB/256 MB
External USB flash-memory slots (Type A)	1
USB console port (mini-Type B) (up to 115.2 kbps)	1
Serial console port (up to 115.2 kbps)	1
Serial auxiliary port (up to 115.2 kbps	1
Integrated power supply	AC
Power-supply options	POE (external)
Redundant-power-supply support	No
Power Specifications	
AC input voltage	100—240V ~
AC input frequency	47—63 Hz
AC input current range AC power supply (maximum) (amps)	1.5—0.6
AC input surge current	<50A
Typical power (no modules)	25W
Maximum power capacity with AC power supply	60W
Maximum power capacity with PoE power supply (platform only)	70W
Maximum PoE device power capacity with PoE power supply	80W
Physical Specifications	
Dimensions (H x W x D)	1.75 x 13.5 x 11.5 in.

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	Cisco 1921 Integrated Services Router
Rack height	1RU
Rack-mount 19in. (48.3 cm) EIA	optional
Wall-mount (refer to installation guide for approved orientation)	Yes
Weight - with AC power supply (no modules)	12 lb
Weight - with PoE power supply (no modules)	12.8 lb
Maximum weight - fully configured	14 lb
Airflow	Back to Sides
Environmental Specifications	
Operating Condition	
Temperature: 5906 feet (1800m) maximum altitude	0–40°C (32—104°F)
Temperature: 9843 feet (3000m) maximum altitude	0—25°C (32—77°F)
Altitude	3000m (10000 ft)
Humidity	10 to 85% RH
Acoustic: Sound pressure (typical /maximum)	32.99/58.33 dBA
Acoustic: Sound power (typical/maximum)	41.99/67.22 dBA
Transportation/Storage Condition	
Temperature	—40 to 70°C (—40 to 158°F)
Humidity	5 to 95% RH
Altitude	4570m (15000 ft)
Regulatory Compliance	
Safety	UL 60950-1 CAN/CSA C22.2 No. 60950-1 EN 60950-1 AS/NZS 60950-1 IEC 60950-1
EMC	47 CFR, Part 15 ICES-003 Class A EN55022 Class A CISPR22 Class A AS/NZS 3548 Class A VCCI V-3 EN 300-386 EN 61000 (Immunity) EN 55024, CISPR 24 EN50082-1
Telecom	TIA/EIA/IS-968 CS-03 ANSI T1.101 IEEE 802.3 RTTE Directive

Supported Modules

Cisco 1921 routers support a wide range of modules that span industry-leading breadth of services at the branch office. Please refer to the following link for the list of modules supported on the Cisco 1900: http://www.cisco.com/en/US/products/ps10538/products_relevant_interfaces_and_modules.html.

Ordering Information

The Cisco 1921 is orderable at the Cisco Ordering Home Page.

For more information about the Cisco 1900 Series, visit http://www.cisco.com/go/1921.

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Table 8 gives ordering information for the Cisco 1921 Router. For information about how to order the Cisco 1900 Series, please visit the Cisco 1900 Series Ordering Guide. To place an order, visit the Cisco Ordering Home Page. For additional product numbers, including the Cisco 1900 Series bundle offerings, please check the Cisco 1900 Series Integrated Services Router Price List or contact your local Cisco account representative.

Table 8. Cisco 1921 Basic Ordering Information

Product Number	Product Description
Cisco1921/K9	Cisco 1921 with 2 onboard GE, 2 EHWIC slots, 256MB USB Flash (internal) 512MB DRAM, IP Base Lic
Cisco1921-SEC/K9	Cisco 1921 with 2 onboard GE, 2 EHWIC slots, 256MB USB Flash (internal) 512MB DRAM, SEC Feature Lic
Cisco1921-T1SEC/K9	Cisco 1921 SEC T1 bundle with HWIC-1DSU-T1, 256F/512D, IOS SEC Lic
CISCO1921-ADSL2/K9	Cisco 1921 ADSL2+ bundle with HWIC-1ADSL, 256F/512D, IP Base Lic
C1921-ADSL2-M/K9	Cisco 1921 ADSL2+ Annex M bundle, with HWIC-1ADSL-M, 256F/512D, IP Base Lic
C1921-4SHDSL/K9	Cisco 1921 4-pair G.SHDSL bundle, with HWIC-4SHDSL, 256F/512D, IP Base Lic

To download the Cisco 1921 with Cisco IOS Software, go to Download Software, click "Router Software", and go to "Cisco ISR 1921 Integrated Services Router."

ISR Migration Options

Cisco 1900 Series Routers are included in the standard Cisco Technology Migration Program (TMP). Refer to http://www.cisco.com/go/TMP and contact your local Cisco account representative for program details.

Warranty Information

The Cisco 1900 Series Integrated Services Routers have a 1-year limited liability warranty.

Cisco and Partner Services for the Branch Office

Services from Cisco and our certified partners can help you reduce the cost and complexity of branch-office deployments. We have the depth and breadth of experience across technologies to architect a blueprint for a branch-office solution to meet your company's needs. Planning and design services align technology with business goals and can increase the accuracy, speed, and efficiency of deployment. Technical services help maintain operational health, strengthen software application functions, solve performance problems, and lower expenses. Optimization services are designed to continually improve performance and help your team succeed with new technologies. For more information, please visit http://www.cisco.com/go/services.

Cisco SMARTnet® technical support for the Cisco 1900 Series is available on a one-time or annual contract basis. Support options range from help-desk assistance to proactive, onsite consultation. All support contracts include:

- Major Cisco IOS Software updates in protocol, security, bandwidth, and feature improvements
- Full access rights to Cisco.com technical libraries for technical assistance, electronic commerce, and product information
- Access to the industry's largest dedicated technical support staff 24 hours a day

For More Information

For more information about the Cisco 1900 Series, visit http://www.cisco.com/go/1900 or contact your local Cisco account representative.

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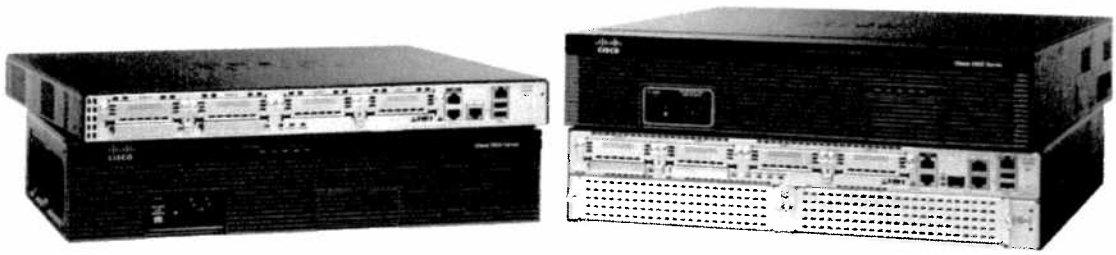
Data Sheet

Cisco 2900 Series Integrated Services Routers

Cisco® 2900 Series Integrated Services Routers build on 25 years of Cisco innovation and product leadership. The new platforms are architected to enable the next phase of branch-office evolution, providing rich media collaboration and virtualization to the branch while maximizing operational cost savings The Integrated Services Routers Generation 2 platforms are future-enabled with multi-core CPUs, support for high capacity DSPs (Digital Signal Processors) for future enhanced video capabilities, high powered service modules with improved availability, Gigabit Ethernet switching with enhanced POE, and new energy monitoring and control capabilities while enhancing overall system performance. Additionally, a new Cisco IOS® Software Universal image and Services Ready Engine module enable you to decouple the deployment of hardware and software, providing a flexible technology foundation which can quickly adapt to evolving network requirements. Overall, the Cisco 2900 Series offer unparalleled total cost of ownership savings and network agility through the intelligent integration of market leading security, unified communications, wireless, and application services.

Figure 1. Cisco 2900 Series Integrated Services Routers



Product Overview

Cisco 2900 Series builds on the best-in-class offering of the existing Cisco 2800 Series Integrated Services Routers by offering four platforms (Figure 1): the Cisco 2901, 2911, 2921, and 2951 Integrated Services Routers.

All Cisco 2900 Series Integrated Services Routers offer embedded hardware encryption acceleration, voice- and video-capable digital signal processor (DSP) slots, optional firewall, intrusion prevention, call processing, voicemail, and application services. In addition, the platforms support the industries widest range of wired and wireless connectivity options such as T1/E1, T3/E3, xDSL, copper and fiber GE.

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Key Business Benefits

The Integrated Services Routers Generation 2 (ISR G2) provide superior services integration and agility. Designed for scalability, the modular architecture of these platforms enables you to grow and adapt with your business needs. Table 1 lists the business benefits of the Cisco 2900 Series.

Table 1. Key Business Benefits of the Cisco 2900 Series Integrated Services Routers

Benefits	Description
Services Integration	• The Cisco 2900 Series ISRs offer increased levels of services integration with voice, video, security, wireless, mobility, and data services, enabling greater efficiencies and cost savings.
Services On Demand	• A single Cisco IOS® Software Universal image is installed on each ISR G2. The Universal image contains **all** of the Cisco IOS technology sets which can be activated with a software license. This allows your business to quickly deploy advanced features without downloading a new IOS image. Additionally, larger default memory is included to support the new capabilities. • The Cisco Services Ready Engine (SRE) enables a new operational model which allows you to reduce capital expenditures (CapEx) and deploy a variety of application services as needed on a single integrated compute services module.
High Performance with Integrated Services	• The Cisco 2900 Series enables deployment in high speed WAN environments with concurrent services enabled up to 75 Mbps. • A multigigabit fabric (MGF) enables high-bandwidth module-to-module communication without compromising routing performance.
Network Agility	• Designed to address customer business requirements, the Cisco 2900 Series modular architecture offers increased capacity and performance as your network needs grow. • Modular interfaces offer increased bandwidth, a diversity of connection options, and network resiliency.
Energy Efficiency	• The Cisco 2900 Series architecture provides energy-saving features that include the following: ◦ The Cisco 2900 Series offers intelligent power management and allows the customer to control power to the modules based on the time of day. Cisco EnergyWise technology will be supported in the future. ◦ Services integration and modularity on a single platform performing multiple functions, optimizes raw materials consumption and energy usage. ◦ Platform flexibility and ongoing development of both hardware and software capabilities lead to a longer product lifecycle, lowering all aspects of the total cost of ownership, including materials and energy use. ◦ High efficiency power supplies are provided with each platform.
Investment Protection	• The Cisco 2900 Series maximizes investment protection: ◦ Reuse of a broad array of existing modules supported on the original Integrated Services Routers provides a lower cost of ownership. ◦ A rich set of Cisco IOS Software features carried forward from the original Integrated Services Routers and delivered in a single universal image. ◦ Flexibility to adapt as your business needs evolve.

Platform Architecture and Modularity

The Cisco 2900 Series is architected to meet the application demands of today's branch offices with design flexibility for future applications. The modular architecture is designed to support increasing bandwidth requirements, time-division multiplexing (TDM) interconnections, and fully integrated power distribution to modules supporting 802.3af Power over Ethernet (PoE) and Cisco Enhanced PoE (ePoE). Table 2 lists the architectural features and benefits of the Cisco 2900 Series.

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Table 2. Architectural Features and Benefits

Architectural Feature	Benefits
Modular Platform	• The Cisco 2900 Series ISRs are highly modular platforms with several types of module slots to add connectivity and services for varied branch-office network requirements. • The ISRs offer an industry-leading breadth of LAN and WAN connectivity options through modules to accommodate field upgrades for future technologies without requiring a platform replacement.
Processors	• The Cisco 2900 Series are powered by high-performance multi-core processors that can support the growing demands of high-speed WAN connections to the branch-office while also running multiple concurrent services.
Embedded IP Security with Security Sockets Layer (IPSec/SSL) VPN Hardware Acceleration	• Embedded hardware encryption acceleration is enhanced to provide higher scalability, which combined with an optional Cisco IOS Security license, enables WAN link security and VPN services (both IPSec and SSL acceleration). • The onboard encryption hardware replaces and outperforms the advanced integration modules (AIMs) of previous generations.
Multigigabit Fabric (MGF)	• The Cisco 2900 Series introduces an innovative multigigabit fabric (MGF) that allows for efficient module-to-module communication, enabling tighter services interactions across modules while reducing the overhead on the route processor.
TDM Interconnectivity Fabric	• Unified communications services in the branch office are significantly enhanced with the use of a TDM interconnectivity fabric in the system architecture, allowing for scaling of DS-0 channel capacity.
Integrated Gigabit Ethernet Ports	• All onboard WAN ports are 10/100/1000 Gigabit Ethernet WAN routed ports. • One of the three 10/100/1000 Ethernet WAN ports on the Cisco 2921 and 2951 supports Small Form-Factor Pluggable (SFP)-based connectivity in lieu of a RJ-45 port and enabling fiber connectivity.
Innovative Universal-Serial-Bus (USB)-Based Console Access	• A new, innovative USB console port offers management connectivity for devices without a serial port such as modern laptop computers. • Traditional console and auxiliary ports are also available.
Optional Integrated Power Supply for Distribution of PoE and Universal DC Power Supply	• An optional upgrade to the internal power supply provides inline power (802.3af-compliant PoE and Cisco Inline Power) to integrated switch modules. • On the Cisco 2911, 2921, and 2951, an optional DC power supply will be available in the future that extends deployment into central offices and industrial environments.
Optional External Redundant Power Supply (RPS)	• The Cisco 2911, 2921, and 2951 allow for power redundancy through the use of an external RPS device, thereby decreasing network downtime and protecting the network from power-supply failures. • Redundant power on the Cisco 2900 Series is supported through the Cisco RPS 2300 Redundant Power System. You can use the Cisco RPS 2300 to provide redundant power for Cisco 2900 Series ISRs as well as Cisco Catalyst® switches. • In order to use the Cisco RPS 2300, an external RPS adapter is required (configurable option) to connect the platform to the external RPS.
PoE Boost	• When connected to an external RPS device, the Cisco 2911, 2921, and 2951 can operate in a PoE boost configuration in lieu of redundant power mode—whereby the power capacity of the platform is increased to twice the normal level to power additional PoE ports.
Designed for Flexible Deployments	• The Cisco 2911 and 2951 are designed for NEBS environments. • The 2911 is 12" deep and has an optional fan filter for deployments in a variety of environments. An assembly that provides front-to-back airflow is also available for 23" racks.

Modularity Features and Benefits

The Cisco 2900 Series provides significantly enhanced modular capabilities (refer to Table 3) offering investment protection for customers. Most of the modules available on previous generations of Cisco routers, such as the Cisco 2800 Series, are supported on the Cisco 2900 Series. Additionally, modules can be used on other supported Cisco platforms to provide maximum investment protection. Taking advantage of common interface cards across a network greatly reduces the complexity of managing inventory requirements, implementing large network rollouts, and maintaining configurations across a variety of branch-office sizes.

A complete list of supported modules, including a list of supported SFPs for the Cisco 2900 Series, is available at: http://www.cisco.com/go/2900

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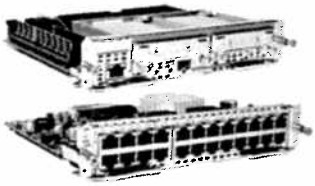
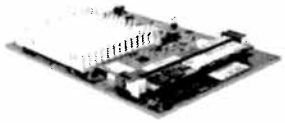
Table 3. Modularity Features and Benefits

ISR Modules	Benefits
Cisco Service Module 	• Each service module slot offers high-data-throughput capability: ◦ Up to 4 Gbps aggregate toward the route processor ◦ Up to 2 Gbps aggregate to other module slots over MGF • Service module (SM) slots are highly flexible with support for double-wide service modules (SM-Ds), which are Service Modules that require two SM slots. SM-Ds in the Cisco 2921 and 2951 provide flexibility for higher-density modules. • A service module slot replaces the network module and the extension module for voice/fax (EVM) slots and is offered on Cisco 2911, 2921, and 2951 ISRs. • An adapter module enables backward compatibility with existing network modules, enhanced network modules (NMEs), and EVMs. • Service module slots provide twice the power capabilities relative to the network-module slots, allowing for flexibility for higher-scale and better-performance modules. • Power to service module slots can be managed by extensions similar to the Cisco EnergyWise framework, so your organization can reduce energy consumption in your network infrastructure. Full EnergyWise support will be available in future software releases.
Cisco Enhanced High-Speed WAN Interface Card (EHWIC)	• The EHWIC slot provides enhancements to the prior generation's high-speed WAN interface card (HWIC) slots while provide maximum investment protection by natively supporting HWICs, WAN interface cards (WICs), voice interface cards (VICs), and voice/WAN interface cards (VWICs). • Four integrated EHWIC slots on the Cisco 2901, 2911, 2921, and 2951 allow for more flexible configurations. • Each HWIC slot offers high-data-throughput capability: ◦ Up to 1.6 Gbps aggregate toward the route processor ◦ Up to 2 Gbps aggregate to other module slots over the MGF • Flexibility to support double-wide modules is enabled by combining two EHWIC slots. Up to 2 doublewide HWIC (HWIC-D) modules are supported.
Cisco Internal Services Module (ISM) 	• A single ISM slot provides flexibility to integrate intelligent service modules on an internal slot within the chassis • Each ISM slot offers high-data-throughput capability: ◦ Up to 4 Gbps aggregate toward the route processor ◦ Up to 2 Gbps aggregate to other module slots over the MGF • The ISM replaces the AIM slot; existing AIM modules are not supported in the ISM slot. • Power to ISM slots can be managed by extensions similar to the Cisco EnergyWise framework, so your organization can reduce energy consumption in your network infrastructure. Full EnergyWise support will be available in future software releases.
Cisco High-Density Packet Voice Digital Signal Processor (DSP) Module (PVDM3) Slots on Motherboard	• PVDM3 slots natively support PVDM3 modules, providing support for richer density for rich-media voice and video. • Each PVDM3 slot connects back to the system architecture through a 2 Gbps aggregate link through the MGF. • Investment protection for PVDM2 modules is supported through an adapter module. • Power to the PVDM slots can be managed by extensions similar to the Cisco EnergyWise framework, so your organization can reduce energy consumption in your network infrastructure. Full EnergyWise support will be available in future software releases.
Compact Flash Slots	• Two external Compact Flash slots are available on the Cisco 2900 Series Integrated Services Routers. Each slot can support high-speed storage densities upgradeable to 4 GB in density.
USB 2.0 Ports	• Two high-speed USB 2.0 ports are supported. The USB ports enable secure token capabilities and storage.

Cisco IOS Software

Cisco 2900 Series Integrated Services Routers deliver innovative technologies running on industry-leading Cisco IOS Software. Developed for wide deployment in the world's most demanding enterprise, access, and service provider networks, the Integrated Services Routers Generation 2 platforms are supported on Cisco IOS Software releases 15M&T. Release 15.0(1)M is available immediately and provides support for a comprehensive portfolio of Cisco technologies, including the functionality and features delivered in releases 12.4 and 12.4T. New innovations

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in 15.0(1)M span multiple technology areas, including security, voice, high availability, IP Routing and Multicast, quality of service (QoS), IP Mobility, Multiprotocol Label Switching (MPLS), VPNs, and embedded management.

Cisco IOS Software Licensing and Packaging

A single Cisco IOS Universal image encompassing all IOS technology feature sets is delivered with the platforms. You can enable advanced features by activating a software license on the Universal image. In previous generations of access routers, these feature sets required you to download a new software image. Technology packages and feature licenses, enabled through the Cisco software licensing infrastructure, simplify software delivery and decrease the operational costs of deploying new features.

Four major technology licenses are available on the Cisco 2900 Series Integrated Services Routers; you can activate the licenses through the Cisco software activation process identified at http://www.cisco.com/go/sa. The four licenses are as follows:

- IP Base: This technology package is available as default.
- Data
- Unified Communications
- Security (SEC) or Security with No Payload Encryption (SEC-NPE)

For additional information and details about Cisco IOS Software licensing and packaging on Cisco 2900 Series Integrated Services Routers, please visit http://www.cisco.com/go/2900l.

Key Branch-Office Services

The Cisco Integrated Services Routers are industry-leading platforms that offer unprecedented levels of services integration. Designed to meet the requirements of the branch office, these platforms provide a complete solution with voice, video, security, mobility and application services. Businesses enjoy the benefit of deploying a single device that meets all their needs, reducing capital and operational expenses.

Unified Communications, Collaboration, and Voice-Gateway Services

The Cisco 2900 Integrated Services Router is the foundation for collaboration in the small and midsize branch office, serving as a critical component of a Cisco's video architecture (Medianet) and enterprise Unified Communications solution. With embedded voice services and a wide range of supported telephony interfaces, the Cisco 2900 Series delivers maximum deployment flexibility for the distributed enterprise. Unified communications is enabled through a rich signaling and media-processing infrastructure, including a variety of protocols, media interworking, signal and media security, transcoding, conferencing, and QoS. Cisco Integrated Services Routers also feature a wide range of voice-gateway interfaces, supporting a broad array of signaling and physical network interfaces.

The Cisco 2900 Series enables a full range of existing and emerging video services, with scaling improvements to support Cisco TelePresence® conferencing, security, and session control. The Cisco Unified Border Element extends these capabilities for business-to-business TelePresence communications. The Cisco 2900 Series adds support for the new Cisco High-Density Packet Voice Digital Signal Processor (DSP) Module (PVDM3), which has been optimized for voice and video support. The new PVDM3 modules support all voice-gateway functions of earlier generations of PVDMs and add higher density and more processing power to support emerging rich-media applications. The Cisco 2900 Series provides 2 or 3 onboard PVDM3 slots, depending on the platform.

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Cisco Unified Communications Manager Express and Survivable Remote Site Telephony

The Cisco Integrated Services Routers natively provide optional unified communications services within the Cisco IOS Software, minimizing the IT hardware footprint and total cost of ownership at the branch office. Cisco Unified Communications Manager Express (CME) provides a broad range of IP private-branch-exchange (PBX) and key-system features integrated into the router for the small and midsize branch office. Cisco Survivable Remote Site Telephony (SRST), also inherently available in Cisco IOS Software, and an option on the Cisco 2900 Series, helps ensure that branch-office employees have uninterrupted telephony services and features, even if the connection to a centralized Cisco Unified Communications Manager is disrupted. Coupled with Cisco Unity® Express, the integrated solution for voicemail, Automated Attendant, and interactive voice response (IVR), the Cisco 2900 Series offers the branch office a complete range of unified communications services while delivering industry-leading security within a single platform.

VoiceXML Application Services

The Cisco 2900 Series also supports standards-certified VoiceXML browser services. VoiceXML is an open-standard markup language used to create voice-enabled web browsers and IVR applications. Just as HTML enables you to retrieve data with a PC, VoiceXML enables you to retrieve data using voice or dual-tone-multifrequency (DTMF) telephony input. The Cisco 2900 Series can deliver a much higher range of concurrent voice-gateway services combined with VoiceXML browser services, for up to 200 sessions on the Cisco 2951.

Cisco Unified Border Element

The Cisco Unified Border Element capabilities supported on the Cisco 2900 Series address the emerging requirements in an IP-centric interconnect for branch-office unified communications between enterprises and service provider networks. Cisco Unified Border Element provides intelligent border-element functions such as physical and logical ingress and egress demarcation points, signaling and media control, and consolidated security and management features. The Cisco 2900 Series supports higher scale than previously provided on the Cisco 2800 Series, up to three times the number of sessions.

Integrated Network Security for Data, Voice, Video, and Mobility

Security is essential to protect a business' intellectual property while also ensuring business continuity and providing the ability to extend the corporate workplace to employees who need anytime, anywhere access to company resources. As part of the Cisco' SAFE architectural framework that allows organizations to identify, prevent, and adapt to network security threats, the Cisco 2900 Series Integrated Services Routers facilitate secure business transactions and collaboration.

The Cisco IOS Software Security technology package for the Cisco 2900 Series offers a wide array of common security features such as advanced application inspection and control, threat protection, and encryption architectures for enabling more scalable and manageable VPN networks. The Cisco 2900 Series offers onboard hardware-based encryption acceleration to provide greater IPSec throughput with less overhead for the route processor when compared with software-based encryption solutions. Cisco Integrated Services Routers offer a comprehensive and adaptable security solution for branch offices that includes features such as:

- **Secure connectivity:** Secure collaborative communications with Group Encrypted Transport VPN, Dynamic Multipoint VPN (DMVPN), or Enhanced Easy VPN
- **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 Flexible Packet Matching (FPM)

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- **Identity management:** Intelligently protecting endpoints using technologies such as authentication, authorization, and accounting (AAA) and public key infrastructure (PKI)

Detailed information about the security features and solutions supported on the Cisco 2900 Series is available at http://www.cisco.com/go/routersecurity.

Wireless and Mobility Services

Wireless LAN/WAN

The Cisco Integrated Services Routers supporting the Cisco Unified Wireless Architecture enable deployment of secure, manageable wireless LANs (WLANs) optimized for remote sites and branch offices, including fast secure mobility, survivable authentication, and simplified management. The Cisco Wireless LAN Controller Module on the Cisco 2900 Series allows small and medium-sized businesses (SMBs) and enterprise branch offices to cost-effectively deploy and manage secure WLANs. Cisco Wireless LAN Controllers work in conjunction with Cisco lightweight access points and the Cisco Wireless Control System (WCS) to provide system-wide WLAN functions, managing up to 6, 12, and 25 access points.

Wireless WAN

Cisco third-generation (3G) wireless WAN (WWAN) modules combine traditional enterprise router functions, such as remote management, advanced IP services such as voice over IP (VoIP), and security, with mobility capabilities of 3G WAN access. Using high-speed 3G wireless networks, routers can replace or complement existing landline infrastructure, such as dialup, Frame Relay, and ISDN. Cisco 3G solutions support 3G standards High-Speed Packet Access (HSPA) and Evolution Data Only/Evolution Data Optimized (EVDO) providing you with a true multipath WAN backup and the ability to rapidly deploy primary WAN connectivity. For more information about 3G solutions on Cisco Integrated Services Routers, please visit www.cisco.com/go/3g.

Integrated LAN Switching

The Cisco 2900 Integrated Services Routers (Cisco 2911 through Cisco 2951) support the new Cisco Enhanced EtherSwitch® Service Modules, which greatly expand router capabilities by integrating industry-leading Layer 2 or Layer 3 switching with feature sets identical to those found in the Cisco Catalyst 2960 and Catalyst 3650-E Series Switches performing local line-rate switching and routing.

The new Cisco Enhanced EtherSwitch Service Modules take advantage of the increased power capabilities on the Cisco 2900 ISRs. Additionally, the Cisco Enhanced EtherSwitch modules enable the newest Cisco power initiatives, Cisco EnergyWise, Cisco Enhanced Power over Ethernet (ePoE), per-port PoE power monitoring, and RPS-enabled PoE boost. These technologies allow you to meet increased endpoint power requirements without increasing the total power consumption of the branch.

Application Services

As organizations continue to centralize and consolidate their branch-office IT infrastructure in an effort to reduce cost and complexity, they are challenged to provide an excellent user experience, ensure continuous service availability, and deliver business-relevant applications when and where they are needed. To address these challenges, the Cisco 2900 Series provides the capability to host Cisco, third-party, and custom applications on a portfolio of high-performance Cisco Services Ready Engine (SRE) modules that transparently integrate into the router. The modules have their own processors, storage, network interfaces, and memory that operate independently of the host router resources, helping to ensure maximum concurrent routing and application

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performance while reducing physical space requirements, lowering power consumption, and consolidating management.

Application Acceleration

The Cisco 2900 Series seamlessly combines industry leading security, IOS-based traffic control and visibility, with Cisco application acceleration solutions. Cisco IOS Software features such as NBAR, IP SLA, and NetFlow provide visibility and monitoring of traffic patterns and application performance while IOS features such as QoS, ACLs, and PfR intelligently control the traffic to maximize the quality of the user experience and employee productivity. The user experience can be further enhanced through the addition of a Cisco WAAS Network Module which can be used to securely provide more advanced WAN optimization techniques such as TCP optimization, caching, compression, and application acceleration. Cisco Integrated Services Routers combined with Cisco WAAS Network Modules, provide optimal performance for applications delivered from a central data center to branch-office users. The solution allows you to consolidate costly server, storage, and backup infrastructure into data centers while maintaining LAN-like service levels for remote users.

Cisco Services Ready Engine

The Cisco Services Ready Engine solution is available in a Service Module (SM) and Internal Service Module (ISM) form factor. The Service Module hardware offers up to a seven times performance improvement over the previous generation Network Modules and provides a multi-core x86-64 processor. The SRE modules also support up to 1 terabyte of storage, RAID configurations, hardware-assisted virtualization and cryptography options. The Cisco SRE module enables on-demand provisioning of branch-office applications on the Cisco 2900 Series platforms so that you can deploy the right application, at the right time, in the right place. The hardware and software decoupling provided by the service-ready deployment model enables applications to be provisioned on the module at the time of its installation or remotely anytime thereafter. Supported solutions include Cisco Wide Area Application Services (WAAS), Cisco Unity Express, Cisco Application Extension Platform (AXP), Cisco Wireless LAN Controller (WLC), Cisco Video Surveillance, and other applications under development. The Service Ready Engine enables organizations of various sizes to future-proof their network by allowing them to quickly deploy new branch-office applications without deploying new hardware, reducing the cost of rolling out branch-office services.

WAAS Express

Organizations today face several unique wide area network (WAN) challenges: the need to provide employees with constant access to centrally located information, the requirement to continuously back up and replicate mission-critical data to centrally managed data centers, the desire to provide satisfactory experience for IP phone and video communication, and the mandate to control bandwidth costs without sacrificing application availability and performance.

Cisco WAAS Express is designed to help organizations address these challenges. Cisco WAAS Express extends the Cisco WAAS product portfolio, with a small-footprint, cost-effective IOS-based software solution integrated into the ISR G2 to offer bandwidth optimization and application acceleration capabilities. Cisco WAAS Express increases remote user productivity, reduces WAN bandwidth costs, and offers investment protection by interoperating with existing Cisco WAAS infrastructure. Cisco WAAS Express is unique in providing network transparency, improving deployment flexibility with on-demand service enablement, and integrating with native IOS-based services such as security, NetFlow, and QoS.

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Cisco WAAS Express is fully interoperable with WAAS on SM-SRE modules, WAAS appliances and can be managed by a common WAAS Central Manager.

Cisco WAAS Express is available in IOS from version 15.1(2)T1.

Further information on Cisco WAAS Express can be found at http://wwwin.cisco.com/artg/products/waas/.

Medianet for 2900 ISRs

As video becomes pervasive in an organization and more video devices are used, new demands are placed on the network. It can be challenging to accommodate video needs while reducing complexity, planning for capacity, and providing the best possible user experience.

Smarter Network, Endpoints, and Services

Traditional IP networks need to evolve to medianets to accommodate these changes. A medianet is an end-to-end IP architecture that helps to enable pervasive media experiences.

The medianet architecture includes a smarter network, smarter endpoints, shared media services, cloud services, and shared media services.

More Medianet Benefits

A medianet reduces total cost of ownership and scales video through features such as auto-configuration and media monitoring. At the same time, it helps to ensure a quality user experience while optimizing bandwidth use and efficiency.

For more information on Medianet for 2900ISR, please go to http://www.cisco.com/en/US/netsol/ns1094/index.html.

Managing Your Integrated Services Routers

Network management applications are instrumental in lowering operating expenses (OpEx) while improving network availability by simplifying and automating many of the day-to-day tasks associated with managing an end-to-end network. Day-one device support provides immediate manageability support for the Integrated Services Router, enabling quick and easy deployment, monitoring, and troubleshooting from Cisco and third-party applications.

Organizations rely on Cisco, third-party, and in-house developed network management applications to achieve their OpEx and productivity goals. Underpinning those applications are the embedded management features available in every Integrated Services Router. The new Integrated Services Routers continue a tradition of broad and deep manageability features such as IP service-level agreement (IP SLA), Cisco IOS Embedded Event Manager (EEM), and NetFlow which allow you to know the status of your network at all times. These features, along with Simple Network Management Protocol (SNMP) and syslog, enable your organization's management applications.

Refer to Tables 4 and 5 below for details about network management and manageability support on Cisco 2900 Series Integrated Services Routers.

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Table 4. Cisco 2900 ISR G2 Series IOS Software Features and Protocols Support

Feature	Support
Protocols	IPv4, IPv6, Static Routes, Open Shortest Path First (OSPF), Enhanced IGRP (EIGRP), Border Gateway Protocol (BGP), BGP Router Reflector, Intermediate System-to-Intermediate System (IS-IS), Multicast Internet Group Management Protocol (IGMPv3) Protocol Independent Multicast sparse mode (PIM SM), PIM Source Specific Multicast (SSM), Distance Vector Multicast Routing Protocol (DVMRP), IPSec, Generic Routing Encapsulation (GRE), Bi-Directional Forwarding Detection (BVD), IPv4-to-IPv6 Multicast, MPLS, L2TPv3, 802.1ag, 802.3ah, L2 and L3 VPN
Encapsulation	Ethernet, 802.1q VLAN, Point-to-Point Protocol (PPP), Multilink Point-to-Point Protocol (MLPPP), Frame Relay, Multilink Frame Relay (MLFR) (FR.15 and FR.16), High-Level Data Link Control (HDLC), Serial (RS-232, RS-449, X.21, V.35, and EIA-530), Point-to-Point Protocol over Ethernet (PPPoE), and ATM
Traffic Management	QoS, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and Network-Based Advanced Routing (NBAR)

Note: For a more comprehensive list of features supported in Cisco IOS software refer to the Feature Navigator tool at http://www.cisco.com/go/fn.

Table 5 lists the embedded management features available with Cisco IOS Software.

Table 5. Embedded Management Features Available with Cisco IOS Software

Feature	Description
WSMA	The Web Services Management Agent (WSMA) defines a mechanism through which you can manage a network device, retrieve configuration data information, and upload and manipulate new configuration data. WSMA uses XML-based data encoding that is transported by the Simple Object Access Protocol (SOAP) for the configuration data and protocol messages.
EEM	Cisco IOS Embedded Event Manager (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.
IPSLA	Cisco IOS IP Service-Level Agreements (SLAs) enable you to assure new business-critical IP applications, as well as IP services that use data, voice, and video in an IP network.
SNMP, RMON, Syslog, NetFlow, and TR-069	Cisco 2900 Series Integrated Services Routers also support SNMP, Remote Monitoring (RMON), syslog, NetFlow, and TR-069 in addition to the embedded management features previously mentioned.

The Cisco network management applications listed in Table 6 are standalone products that you can download or purchase to manage your Cisco network devices. The applications are built specifically for the different operational phases; you can select the ones that best fit your needs.

Table 6. Network Management Applications

Operational Phase	Application	Description
Device staging and configuration	Cisco Configuration Professional	Cisco Configuration Professional is a GUI device-management tool for Cisco IOS Software-based access routers. This tool simplifies router, security, unified communications, wireless, WAN, and basic LAN configuration through easy-to-use wizards.
Network-wide deployment, configuration, monitoring, and troubleshooting	CiscoWorks LMS	CiscoWorks LAN Management Solution (LMS) is a suite of integrated applications for simplifying day-to-day management of a Cisco end-to-end network, lowering OpEx while increasing network availability. CiscoWorks LMS offers network managers an easy-to-use web-based interface for configuring, administering, and troubleshooting the Cisco Integrated Services Routers, using new instrumentation such as Cisco IOS EEM Generic Online Diagnostics (GOLD). In addition to supporting basic platform services of the Integrated Services Router, CiscoWorks also provides added-value support for the Cisco Services Ready Engine, enabling the management and distribution of software images to the SRE, thereby reducing the time and complexities associated with image management.

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Operational Phase	Application	Description
Network-wide staging, configuration, and compliance	CiscoWorks NCM	CiscoWorks Network Compliance Manager (NCM) tracks and regulates configuration and software changes throughout a multivendor network infrastructure. It provides superior visibility into network changes and can track compliance with a broad variety of regulatory, IT, corporate governance, and technology requirements.
Security staging, configuration, and monitoring	Cisco Security Manager	Cisco Security Manager is a leading enterprise-class application for managing security. It delivers provisioning of firewall, VPN, and intrusion-prevention-system (IPS) services across Cisco routers, security appliances, and switch service modules. The suite also includes the Cisco Security Monitoring, Analysis and Response System (Cisco Security MARS) for monitoring and mitigation.
Voice configuration and provisioning	Cisco Unified Provisioning Manager	Cisco Unified Provisioning Manager provides a reliable and scalable web-based solution for managing a company's crucial next-generation communications services. It manages unified communications services in an integrated IP telephony, voicemail, and messaging environment.
Staging, deployment, and changes of licenses	Cisco License Manager	Easily manage Cisco IOS Software activation and licenses for a wide range of Cisco platforms running Cisco IOS Software as well as other operating systems with the secure client-server application Cisco License Manager.
Staging, deployment, and changes to configuration and image files	Cisco Configuration Engine	Cisco Configuration Engine is a secure network management product that provides zero-touch image and configuration distribution through centralized, template-based management.

Summary

As your business strives to lower the total cost of ownership in running your network and increase your overall employee productivity with more centralized and collaborative network applications, you will need more intelligent branch-office solutions. The Cisco 2900 Series offers these solutions by providing enhanced performance and increased modular density to support multiple services. The Cisco 2900 Series is designed to consolidate the functions of many separate devices into a single, compact system.

Table 7. Cisco 2900 Integrated Services Router Product Specifications

	Cisco 2901	Cisco 2911	Cisco 2921	Cisco 2951
Services and Slot Density				
Embedded Hardware-Based Cryptography and Acceleration (IPSec + SSL)	Yes	Yes	Yes	Yes
Cisco Unified SRST Sessions	35	50	100	250
Cisco Unified CCME Sessions	35	50	100	150
Total Onboard WAN 10/100/1000 Ports	2	3	3	3
RJ-45-Based Ports	2	3	3	3
SFP-Based Ports (use of SFP port disables the corresponding RJ-45 port)	0	0	1	1
Service Module Slots	0	1	1	2
Double-Wide Service Module Slots (use of a double-wide slot will occupy all single-wide service module slots in a 2900)	0	0	1	1
EHWIC Slots	4	4	4	4
Double-Wide EHWIC Slots (use of a double-wide EHWIC slot will consume two EHWIC slots)	2	2	2	2
ISM Slots	1	1	1	1

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	Cisco 2901	Cisco 2911	Cisco 2921	Cisco 2951
Onboard DSP (PVDM) Slots	2	2	3	3
Memory DDR2 ECC DRAM—Default	512 MB	512 MB	512 MB	512 MB
Memory (DDR2 ECC DRAM)—Maximum	2 GB	2 GB	2 GB	2 GB
Compact Flash (External)—Default	slot 0: 256 MB slot 1: none	slot 0: 256 MB slot 1: none	slot 0: 256 MB slot 1: none	slot 0: 256 MB slot 1: none
Compact Flash (External)—Maximum	slot 0: 4 GB slot 1: 4 GB	slot 0: 4 GB slot 1: 4 GB	slot 0: 4 GB slot 1: 4 GB	slot 0: 4 GB slot 1: 4 GB
External USB 2.0 Flash Memory Slots (Type A)	2	2	2	2
USB Console Port (Type B) (up to 115.2 kbps)	1	1	1	1
Serial Console Port	1	1	1	1
Serial Auxiliary Port	1	1	1	1
Power-Supply Options	AC and PoE	AC, PoE, and DC	AC, PoE, and DC	AC, PoE, and DC
RPS Support (External)	No	Cisco RPS 2300	Cisco RPS 2300	Cisco RPS 2300
Power Specifications				
AC Input Voltage	100 to 240 VAC auto ranging	100 to 240 VAC auto ranging	100 to 240 VAC auto ranging	100 to 240 VAC auto ranging
AC Input Frequency	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
AC Input Current Range AC Power Supply (Maximum)	1.5 to 0.6A	2.2 to 1.0A	3.4 to 1.4A	3.4 to 1.4A
AC Input Surge Current	<50A	<50A	<50A	<50A
Typical Power (No Modules) (Watts)	40	50	60	70
Maximum Power with AC Power Supply (Watts)	150	210	320	340
Maximum Power with PoE Power Supply (Platform Only) (Watts)	175	250	370	405
Maximum End-Point PoE Power Available from PoE Power Supply (Watts)	130	200	280	370
Maximum End-Point PoE Power Capacity with PoE Boost (Watts)	N/A	750	750	750
DC Input Voltage	N/A	24 to 60 Vdc, autoranging positive or negative	24 to 60 Vdc, autoranging positive or negative	24 to 60 Vdc, autoranging positive or negative
DC Input Current	N/A	(MAX) 8A (24V) 3.5A (60V)	(MAX) 12A (24V) 5A (60V)	(MAX) 12A (24V) 5A (60V)
Physical Specifications				
Dimensions (H x W x D)	1.75 x 17.25 x 17.3 in. (44.5 x 438.2 x 439.4 mm)	3.5 x 17.25 x 12 in. (88.9 x 438.2 x 304.8 mm)	3.5 x 17.25 x 18.5 in. (88.9 x 438.2 x 469.9 mm)	3.5 x 17.25 x 18.5 in. (88.9 x 438.2 x 469.9 mm)
Rack Height	1RU (rack unit)	2RU	2RU	2RU
Rack-Mount 19 in. (48.3 cm) EIA	Included	Included	Included	Included
Rack-Mount 23 in. (58.4 cm) EIA	Optional	Optional	Optional	Optional
Wall-Mount (refer to installation guide for approved orientation)	Yes	Yes	No	No
Weight with AC Power Supply (No Modules)	13.4 lb (6.1 kg)	18 lb (8.2 kg)	29 lb (13.2 kg)	29 lb (13.2 kg)
Weight with AC PoE Power Supply (No Modules)	14.3 lb (6.5 kg)	19 lb (8.6 kg)	30 lb (13.6 kg)	30 lb (13.6 kg)
Typical Weight Fully Configured	16 lb (7.3 kg)	21 lb (9.5 kg)	34 lb (15.5 kg)	34 lb (15.5 kg)

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	Cisco 2901	Cisco 2911	Cisco 2921	Cisco 2951
Airflow	Front to side	Side to side	Front to back	Front to back
Optional Airflow Kit	N/A	Front to back	N/A	N/A
Environmental Specifications				
Operating Conditions				
Temperature: 5,906 feet (1,800m) Maximum Altitude	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)
Temperature: 9,843 feet (3,000m) Maximum Altitude	32 to 77°F (0 to 25°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)
Temperature: 13,123 feet (4,000m) Maximum Altitude	N/A	32 to 86°F (0 to 30°C)	32 to 86°F (0 to 30°C)	32 to 86°F (0 to 30°C)
Temperature: Short-Term (per NEBS) 5906 feet (1,800m) Maximum Altitude	N/A	23°F to 122°F (–5 to 50°C)	N/A	23°F to 122°F (–5 to 50°C)
Aititude	10,000 ft (3,000m)	13,000 ft (4,000m)	10,000 ft (3,000m)	13,000 ft (4,000m)
Relative Humidity	10 to 85%	5 to 85%	10 to 85%	5 to 85%
Short-Term (per NEBS) Humidity	N/A	5% to 90%, but not to exceed 0.024 kg water/kg of dry air	N/A	N/A
Acoustic: Sound Pressure (Typical/Maximum)	41/53 dBA	51.8/62.9 dBA	54.4/67.4 dBA	54.4/67.4 dBA
Acoustic: Sound Power (Typical/Maximum)	49/61 dBA	58.5/70.3 dBA	62.6/74.5 dBA	62.6/74.5 dBA
Non-Operating Conditions				
Temperature	–40 to 158°F (–40 to 70°C)	–40 to 176°F (–40 to 80°C)	–40 to 158°F (–40 to 70°C)	–40 to 158°F (–40 to 70°C)
Relative Humidity	5 to 95%	5 to 95%	5 to 95%	5 to 95%
Altitude	15,000 ft (4,570m)	15,000 ft (4,570m)	15,000 ft (4,570m)	15,000 ft (4,570m)
Regulatory Compliance				
Safety	UL 60950-1	UL 60950-1	UL 60950-1	UL 60950-1
	CAN/CSA C22.2 No. 60950-1	CAN/CSA C22.2 No. 60950-1	CAN/CSA C22.2 No. 60950-1	CAN/CSA C22.2 No. 60950-1
	EN 60950-1	EN 60950-1	EN 60950-1	EN 60950-1
	AS/NZS 60950-1	AS/NZS 60950-1	AS/NZS 60950-1	AS/NZS 60950-1
	IEC 60950-1	IEC 60950-1	IEC 60950-1	IEC 60950-1
EMC	47 CFR, Part 15	47 CFR, Part 15	47 CFR, Part 15	47 CFR, Part 15
	ICES-003 Class A	ICES-003 Class A	ICES-003 Class A	ICES-003 Class A
	EN55022 Class A	EN55022 Class A	EN55022 Class A	EN55022 Class A
	CISPR22 Class A	CISPR22 Class A	CISPR22 Class A	CISPR22 Class A
	AS/NZS 3548 Class A	AS/NZS 3548 Class A	AS/NZS 3548 Class A	AS/NZS 3548 Class A
	VCCI V-3	VCCI V-3	VCCI V-3	VCCI V-3
	CNS 13438	CNS 13438	CNS 13438	CNS 13438
	EN 300-386	EN 300-386	EN 300-386	EN 300-386
	EN 61000 (Immunity)	EN 61000 (Immunity)	EN 61000 (Immunity)	EN 61000 (Immunity)
	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
	EN50082-1	EN50082-1	EN50082-1	EN50082-1
Telecom	TIA/EIA/IS-968	TIA/EIA/IS-968	TIA/EIA/IS-968	TIA/EIA/IS-968
	CS-03	CS-03	CS-03	CS-03
	ANSI T1.101	ANSI T1.101	ANSI T1.101	ANSI T1.101
	ITU-T G.823, G.824	ITU-T G.823, G.824	ITU-T G.823, G.824	ITU-T G.823, G.824
	IEEE 802.3	IEEE 802.3	IEEE 802.3	IEEE 802.3
	RTTE Directive	RTTE Directive	RTTE Directive	RTTE Directive

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Supported Modules

The Cisco 2900 Series supports a wide range of modules that span industry-leading breadth of services at the branch office. For a list of modules supported on the Cisco 2900 Series, please visit: http://www.cisco.com/en/US/products/ps10537/products_relevant_interfaces_and_modules.html

Ordering Information

The Cisco 2900 Series Integrated Services Routers are orderable and shipping. For information about how to order the Cisco 2900 Series, please visit the Cisco 2900 Series Ordering Guide. To place an order, visit the Cisco Ordering Home Page and refer to Table 8, which provides basic ordering information. For additional product numbers, including the Cisco 2900 Series bundle offerings, please check the Cisco 2900 Series Integrated Services Router Price List or contact your local Cisco account representative.

Table 8. Cisco 2900 Series Basic Ordering Information

Product Name	Product Description
CISCO2901/K9	Cisco 2901 with 2 onboard GE, 4 EHWIC slots, 2 DSP slots, 1 ISM slot, 256MB CF default , 512MB DRAM default, IP Base
CISCO2911/K9	Cisco 2911 with 3 onboard GE, 4 EHWIC slots, 2 DSP slots, 1 ISM slot, 256MB CF default , 512MB DRAM default, IP Base
CISCO2921/K9	Cisco 2921 with 3 onboard GE, 4 EHWIC slots, 3 DSP slots, 1 ISM slot, 256MB CF default , 512MB DRAM default, IP Base
CISCO2951/K9	Cisco 2951 with 3 onboard GE, 4 EHWIC slots, 3 DSP slots, 1 ISM slot, 256MB CF default , 512MB DRAM default, IP Base
SL-29-DATA-K9	Data License for Cisco 2901–2951
SL-29-UC-K9	Unified Communications License for Cisco 2901–2951
SL-29-SEC-K9	Security License for Cisco 2901–2951

Cisco Integrated Services Router Migration Options

Cisco 2900 Series Integrated Services Routers are included in the standard Cisco Technology Migration Program (TMP). Refer to http://www.cisco.com/go/TMP and contact your local Cisco account representative for program details.

Warranty Information

The Cisco 2900 Series Integrated Services Routers have a ninety (90) day limited liability warranty.

Cisco and Partner Services for the Branch

Services from Cisco and our certified partners can help you transform the branch experience and accelerate business innovation and growth in the Borderless Network. We have the depth and breadth of expertise to create a clear, replicable, optimized branch footprint across technologies. Planning and design services align technology with business goals and can increase the accuracy, speed, and efficiency of deployment. Technical services help improve operational efficiency, save money, and mitigate risk. Optimization services are designed to continuously improve performance and help your team succeed with new technologies. For more information, please visit http://www.cisco.com/go/services.

Cisco SMARTnet® technical support for the Cisco 2900 Series is available on a one-time or annual contract basis. Support options range from help-desk assistance to proactive, onsite consultation. All support contracts include:

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