

Cisco 815 Integrated Services Router: Delivering Secure, High-Speed Cable Network Access for Small Offices

The Cisco® 815 Integrated Services Router (Figure 1) offers Cable Multi-Service Operators (MSOs) a cost-effective, standards-based, integrated cable router solution for business-class broadband services. Designed for small office, home office, and teleworker environments, the Cisco 815 complies with DOCSIS® 2.0 and delivers secure data networking over hybrid fiber-coaxial (HFC). The Cisco 815 allows cable MSOs to simplify their customer premises equipment (CPE) deployment by consolidating a multibox deployment into a single-box integrated solution and maximize revenues by offering multiple services.

Figure 1. Cisco 815 Integrated Services Router



The Cisco 815 is the latest addition to the Cisco Systems® Integrated Services Router portfolio, which delivers multiple services, including feature-rich Cisco IOS® Software routing, LAN switching, and advanced security with secure cable WAN access technology. Fully standards-based, the Cisco 815 operates not only in DOCSIS bridge mode, but also in routed mode, and includes advanced routing and security features such as Cisco IOS Firewall, intrusion prevention systems (IPSs), and IP Security (IPsec) VPN features that transform the device into a powerful cable CPE solution.

The Cisco 815 with the HFC offers a cost-effective alternative to leased lines or can be used to supplement leased line or other broadband services such as xDSL services for critical WAN backup solutions. Cable service providers and small business customers can also benefit from ease of deployment and management by deploying an integrated, single-box cable solution, including improved quality-of-service (QoS) enforcement, enhanced WAN failover implementation, and improved availability.

The Cisco 815 includes the following:

- Integrated cable modem based on DOCSIS 2.0
- Optional hardware-based IPsec encryption for secure VPN connectivity (Cisco 815-VPN)
- One Fast Ethernet 10/100BASE-TX WAN port with autosensing and IEEE 802.1q virtual LAN (VLAN) support
- Integrated four-port, 10/100 Ethernet switch, fully manageable with IEEE 802.1q VLAN support
- Auxiliary (AUX) port (up to 115.2 Kbps asynchronous serial) for analog dial backup or out-of-band management

- Console port transmit/receive rates up to 115.2 Kbps (default 9600 bps, not a network data port)
- Advanced routing protocols such as Routing Information Protocol (RIP) v1 and v2, Border Gateway Protocol (BGP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), PIM, IGMPv2, NAT, PAT, DHCP
- Cisco IOS Software stateful firewall with Context-based Access Control (CBAC), IPS and IPsec VPN features
- Advanced QoS and bandwidth management
- Inter-VLAN routing

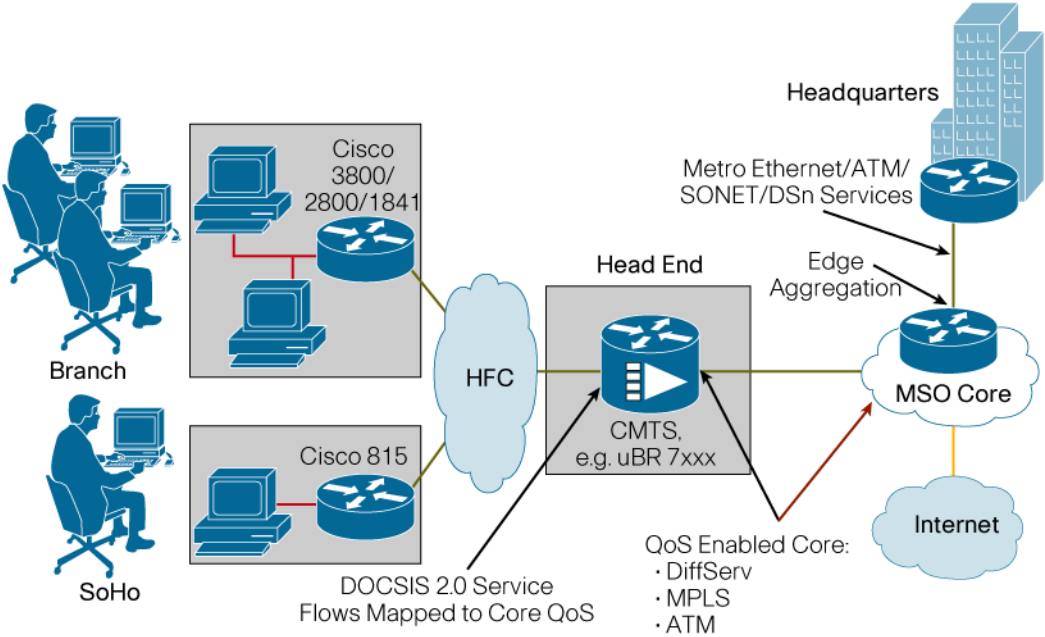
Table 1 summarizes the Cisco 815 features.

Table 1. Cisco 815 Product Summary

Feature	Cisco 815	Cisco 815-VPN (IPsec VPN)
DOCSIS 2.0-based cable interface	Yes	Yes
One Fast Ethernet (10/100BASE-TX) WAN port for backup WAN or network edge	Yes	Yes
4-port managed switch	Yes	Yes
Hardware-based IPsec encryption	No	Yes
Auxiliary port for dial backup or out-of-band management	Yes	Yes
Console port (serial)	Yes	Yes

Figure 2 illustrates business broadband connectivity with the Cisco 815.

Figure 2. Business Broadband Connectivity with Cisco 815



Applications

The Cisco 815 Integrated Services Router is ideally suited to be deployed where a small office is going to be connected to a larger network, most often with a secure VPN connection. These types of offices can include the following:

Small Remote Office: The Cisco 815 connects users in a small remote office, such as insurance agents, lawyer offices, or sales offices. With an always-on cable connection, Internet security is vital to protect business resources from malicious network attacks. VPN encryption and integrated security such as firewalls and intrusion prevention are critical to protect the network at every point. IT managers can centrally manage the remote site to quickly troubleshoot any network problems. For added reliability, customers can also use dial backup, through an external modem, if the primary broadband link fails.

Teleworking: The Cisco 815 is ideal for corporate teleworkers and offers high-speed HFC cable broadband access to the corporate network, as shown in Figure 3. The Cisco 815 gives IT managers a standard platform to manage at the employee's home office. By integrating the cable modem into Cisco IOS Software, the Cisco 815 provides expanded QoS features that adequately allow voice traffic precedence over data applications.

Remote Call Center Agent: Similar to teleworking applications, this solution extends the Cisco IP Contact Center solution for telephone call center agents to remote sites. With a high-quality, secure connection through the Cisco 815, call center agents can be located away from costly call center facilities while maintaining secure and productive voice and data access from their home.

Retail VPN: Retail stores migrating from dial-up or satellite connections for point-of-sale transactions can use the Cisco 815 to use low-cost broadband access with the required security to effectively use these public networks. Multiple devices and applications can then be added to the store network to use the increased bandwidth. (See Figure 4.)

In addition to providing an excellent primary WAN link, the Cisco 815 is also well suited to be used as a secondary WAN link to offload Web traffic directly to the Internet, provide a redundant option for a primary link in case of failure, or provide load balancing with a xDSL or other type of link, as shown in Figure 4.

Figure 3. Secure Broadband Teleworker Solution with Cisco 815

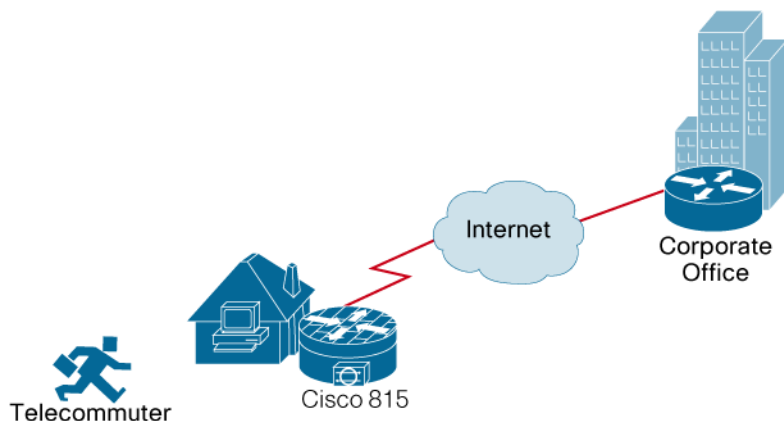
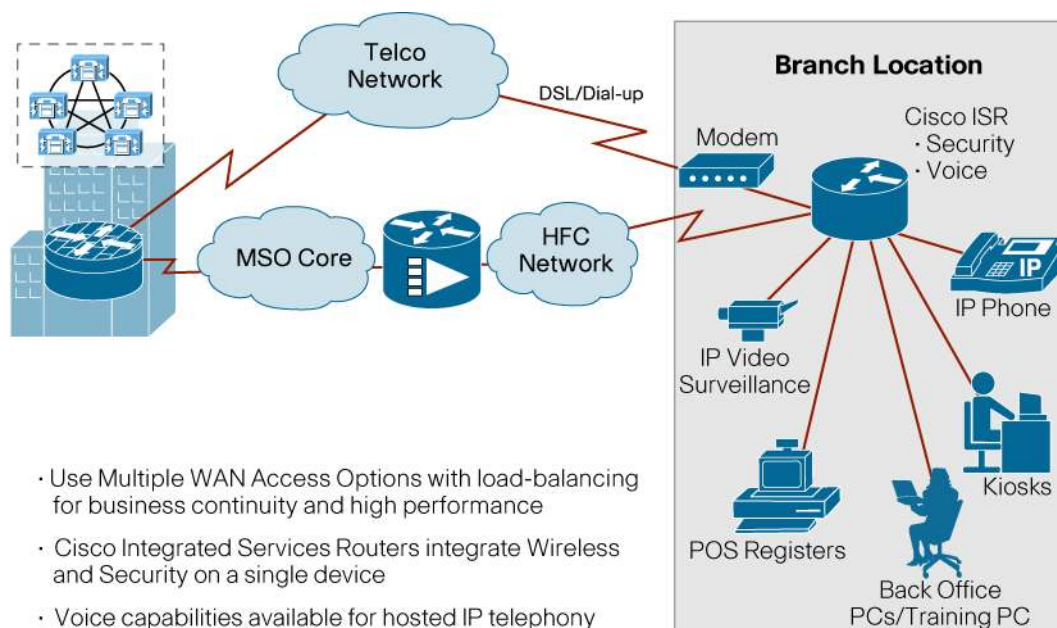


Figure 4. Cable Solution for Branch Office: Redundant WAN Access Options



Comprehensive Feature Set and Benefits

The Cisco 815 offers a broad set of features designed to allow businesses to maximize on their investment and to easily deploy a business-class broadband solution. See Table 2 for features and benefits.

Table 2. Cisco 815 Features and Benefits

Features	Benefits
Hardware Features	
DOCSIS 2.0-based cable WAN interface	Provides standards-based, interoperable, high-speed data connectivity over HFC cable interface with HWIC-CABLE-D-2.
Integrated 10/100Base-TX port	Provides an alternate WAN link to supplement cable WAN.
Integrated 4-port 10/100BASE-T managed switch	Fully managed LAN switch ports with Layer 2 VLAN traffic separation between LAN segments.
Onboard hardware encryption	Provides Data Encryption Standard (DES) and Triple Data Encryption Standard (3DES) high-speed hardware encryption. ¹
Auxiliary port	Allows for modem connection to the router, which can be configured and managed from a remote location. Supports up to 115.2 Kbps. Dial backup available using external analog modem.
Console port	Allows for router configuration and management with a directly connected terminal or PC.
Kensington security lock	Router can be secured to a desktop or other surface using Kensington lockdown equipment.
Software Features	
Full Cisco IOS Software support, including multiprotocol routing	<ul style="list-style-type: none"> • Provides robust, scalable, and feature-rich internetworking software support with RIPv1/v2, BGP, EIGRP, OSPF, PIM, IGMPv2, NAT, PAT, DHCP, and Multiprotocol Label Switching (MPLS) customer edge functions. • Constitutes part of the Cisco end-to-end network solution.
Cisco QoS	Offers support for advanced QoS features such as the Resource Reservation Protocol (RSVP), Low-Latency Queuing (LLQ), Class-Based Weighted Fair Queuing (CBWFQ), and IP Precedence, Policing, and Traffic Shaping to reduce recurring WAN costs and improve performance.
DOCSIS-based QoS	Provides 1 primary and 15 secondary flows for voice, video, and data applications over a single HFC cable WAN connection.

¹ Supported only on Cisco 815-VPN Secure Broadband Cable Router.

Features	Benefits
PacketCable™ multimedia	Offers traffic prioritization or bandwidth reservation for delay-sensitive voice, video, and data services over the cable infrastructure.
AutoSecure	Facilitates rapid implementation of firewall and security policies to optimize network security with a single Cisco IOS Software command.
Access Control Lists (ACLs)	Helps filter traffic based on the specified criteria and prevents malicious attacks.
Complete Security and VPN Capability²	
Cisco IOS Firewall and URL filtering	Application inspection, transparent and stateful firewall, ACLs, and URL filtering protect the network from unauthorized user access. URL filtering prevents inappropriate Websites from being accessed and downloading of offensive content.
IPS	Detects harmful network activity and generates alarms to warn of threats and intrusion attempts. New IPS signatures can be dynamically loaded.
Site-to-site VPN	Connects remote access clients and branch offices to central sites more cost-effectively and flexibly than networks using leased lines, Frame Relay, or ATM.
Dynamic Multipoint VPN (DMVPN)	Allows users to better scale IPsec VPNs by combining generic routing encapsulation (GRE) tunnels, IPsec encryption, and Next Hop Resolution Protocol (NHRP) while offering multicast and QoS.
VPN tunneling with IPsec, GRE, L2TPv3	Allows any standards-based IPsec or L2TPv3 client to interoperate with Cisco IOS Software tunneling technologies.
Cisco Easy VPN	Allows the router to act as remote VPN client and have VPN policies pushed down from the VPN concentrator.
Network Admission Control (NAC)	Helps ensure client devices are using the most up-to-date antivirus application and signature files and protects the network from harmful threats by prohibiting network access if outdated versions are used.
Simplified Management and Ease of Deployment	
Independent router and cable modem management domains	Unique ability to manage and upgrade cable modem firmware and configuration using cable modem termination system (CMTS) independent of the router configuration. Offers cable operator independent domain of cable interface management.
IP Service-Level Agreement (SLA)	Provides the ability to monitor network performance and collect real-time statistics on delay, jitter, and response times to verify and report on SLAs.
Manageable using Simple Network Management Protocol (SNMP) v3	Allows central monitoring, configuration, and diagnostics for all functions integrated in the Cisco router, reducing management time and costs.
Supported Cable MIBs	<ul style="list-style-type: none"> • DOCSIS-IF-MIB • DOCSIS-CABLE-DEVICE-MIB • DOCSIS-CABLE-DEVICE-TRAP-MIB • DOCSIS-QOS-MIB • IF-MIB • RFI-MIB
Cisco Config Express (CX)	Enables direct shipment from Cisco to the end customer or branch office with factory-loaded configurations for high-volume deployments.
CiscoWorks ³	CiscoWorks network management software provides common management across all Cisco routers and switches
Cisco ConfigMaker support	Allows for network setup using the Cisco ConfigMaker application, a wizard-based software tool that helps to easily configure and address Cisco routers, access servers, hubs, switches, and networks.
LED status indicators	Provide at-a-glance indications for power, network activity, and interface status.
Reliability	
WAN link redundancy	Allows the 10/100Base-T Fast Ethernet port to be used as an alternate WAN link.
Dial-on-demand routing	Allows automatic backup of WAN connection using external analog modem in case of a primary link failure.
Hot Standby Router Protocol (HSRP)	Provides high network availability.

² 2 Supported in Advanced Security Image.

³ 3 Supported post-FCS

Network Management and Installation Tools

The Cisco 815 supports a range of network-management and ease-of-installation tools.

CiscoWorks, a Web-based network management suite, provides the ability to remotely configure, administer, monitor, and troubleshoot the Cisco 815. With the increased visibility into network behavior, customers are able to quickly identify performance bottlenecks and track long-term performance trends. CiscoWorks also provides sophisticated configuration tools to optimize bandwidth and utilization across expensive and critical WAN links in the network.

CiscoView, part of CiscoWorks, is a Web-based tool that graphically provides real-time status of the Cisco 815. It can navigate to display monitoring information on interfaces and provide dynamic status, statistics, and comprehensive configuration information.

Product Specifications

Table 3. Cisco 815 Product Specifications

Features	Specifications
Physical Interfaces/Ports	<ul style="list-style-type: none"> • One F-type standard coax interface for HFC network <ul style="list-style-type: none"> ◦ Designed to support CableLabs® DOCSIS 2.0, 1.1, 1.0 • One 10/100BASE-TX Fast Ethernet port (RJ-45) <ul style="list-style-type: none"> ◦ Automatic speed detection ◦ Automatic duplex negotiation ◦ IEEE 802.1Q VLAN trunking and inter-VLAN routing • One auxiliary (AUX) port <ul style="list-style-type: none"> ◦ RJ-45 jack with EIA/TIA-232 interface ◦ Asynchronous serial data terminal equipment (DTE) with full modem controls: Carrier Detect, data set ready (DSR), Request To Send (RTS), Clear To Send (CTS) ◦ Asynchronous serial data rates up to 115.2 kbps • One console port <ul style="list-style-type: none"> ◦ RJ-45 jack with EIA/TIA-232 interface ◦ Asynchronous serial DTE ◦ Transmit/receive rates up to 115.2 kbps (default 9600 bps, not a network data port) ◦ No hardware handshaking such as RTS/CTS • Hardware encryption for IPsec VPN on 815-VPN model
Dimensions and Weight	<ul style="list-style-type: none"> • Width: 11.2 in. (28.4 cm) • Height: 3.1 in. (7.85 cm) • Depth: 8.7 in. (22.1 cm) • Weight (maximum): 2.9 lb (1.32 kg)
Power	<ul style="list-style-type: none"> • Locking connector on power socket • AC input voltage: 100 to 240VAC • Frequency: 47 to 64 Hz • AC input current: 0.5 amps • Power dissipation: 20W (maximum)
Environmental	<ul style="list-style-type: none"> • Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 149°F (-20 to 65°C) • Relative humidity: 10 to 85% noncondensing operating; 5 to 95% noncondensing, nonoperating
Safety	<ul style="list-style-type: none"> • UL 1950 • CSA 22.2—No. 950 • EN60950 • EN41003 • AUSTEL TS001 • AS/NZS 3260 • ETSI 300-047 • BS 6301 (power supply)

EMI	<ul style="list-style-type: none"> • AS/NZS CISPR-22 Class B • FCC Part 15 Class B • EN60555-2 Class B • EN55022 Class B • VCCI Class V-3 Class B • CISPR-22 Class B • EN300-386
Immunity	<ul style="list-style-type: none"> • 55082-1 Generic Immunity Specification Part 1: Residential and Light Industry • EN61000-4-2 (ESD) • EN61000-4-3 (Radiated Immunity) • EN61000-4-4 (EFT Electrical Fast Transients) • EN61000-4-5 (Surge) • EN61000-4-6 (Conducted Immunity) • EN61000-4-11 (Voltage Dips/Sags) • EN61000-3-2 (Harmonics) • EN55024 • CISPR-24

The Cisco 815 is in compliance with the requirements of the countries for distribution. The Cisco 815 conforms to safety, EMI, immunity, and network homologation standards. Details can be obtained through your Cisco reseller or account manager.

CMTS Interoperability

The Cisco 815 is DOCSIS-based and designed to interoperate with CMTSs supporting DOCSIS 1.0, 1.1, and 2.0 standards.

Software Support

The Cisco 815 is supported starting with Cisco IOS Software Release 12.4(6)XE.

The DOCSIS-based and Cisco IOS Software features are supported in the IP Base software image for the Cisco 815, and in the Advanced Security software image for Cisco 815-VPN/K9 as shown in Table 4.

Ordering Information

To place an order, visit the Cisco ordering homepage.

For more information about the Cisco 815, visit <http://www.cisco.com/en/US/products/ps6942/index.html>. Table 4 lists ordering information for the Cisco 815.

Table 4. Ordering Information

Product Part Number	Product Description
Cisco 815	
CISCO815	DOCSIS-based 2.0 broadband cable router with 4 10/100BASE-T switch ports, Cisco IOS Software IP Base image, 32 MB flash, and 64 MB DRAM
CISCO815-VPN-K9	DOCSIS-based 2.0 secure broadband cable router with hardware encryption, 4 10/100BASE-T switch ports, Cisco IOS Software Advanced Security image, 32 MB flash, and 128 MB DRAM
MEM1700-64U96D	64MB to 96MB DRAM factory Upgrade
MEM1700-64U128D	64MB to 128MB DRAM factory Upgrade

Service and Support

Innovative technology deserves innovative support. Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business.

Cisco SMARTnet[®] technical support for the Cisco 815 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
- 24-hour-a-day access to the large, dedicated technical support staff

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

For More Information

For more information about the Cisco 815, visit <http://www.cisco.com/en/US/products/ps6942/index.html> or contact your local account representative.

For more information about other Cisco products, contact:

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