

## Cisco 880 Series Integrated Services Routers

The Cisco® 880 Series Integrated Services Routers combine Internet access, security, voice, and wireless services onto a single, secure device that is simple to use and manage for small businesses and enterprise small branch offices and teleworkers. The Cisco 880 Series delivers features including firewall, content filtering, VPNs, and wireless LANs (WLANs) at broadband speeds to small offices. Easy deployment and centralized management features help enable enterprises or service providers to deploy the Cisco 880 Series in small branch offices or small businesses.

### Product Overview

Cisco 880 Series Integrated Services Routers are fixed-configuration routers that provide collaborative business solutions for secure voice and data communication to small businesses and enterprise teleworkers. They offer concurrent broadband services over third-generation (3G), Metro Ethernet, and multiple DSL technologies to provide business continuity. Wireless 802.11n and 3G offer LAN and WAN mobility. The routers provide the performance required for concurrent services, including firewall, intrusion prevention, content filtering, and encryption for VPNs; optional 802.11g/n for mobility; and quality-of-service (QoS) features for optimizing voice and video applications. In addition, the web-based Cisco Configuration Professional configuration tool (CCP) simplifies setup and deployment. Centralized management capabilities give network managers visibility and control of the network configurations at the remote site.

Cisco 880 Series Integrated Services Routers offer:

- High performance for broadband access in small offices and small branch-office and teleworker sites
- Collaborative services with secure analog, digital voice, and data communication
- Business continuity and WAN diversity with redundant WAN links: Fast Ethernet, G.SHDSL, Multi-mode DSL (VDSL2 and ADSL2/2+), 3G, and ISDN
- Voice enabling features:
  - Survivable Remote Site Telephony (SRST) voice continuity for enterprise small branch-office and teleworker sites
  - Cisco Unified Border Element (CUBE) IP-IP Voice gateway functionality for connecting to SIP trunking services as a replacement for PRI or FXO voice connectivity to the Service Provider. NOTE: CUBE support for Cisco 88X has feature limitations as compared to ISR-G2. Go to <http://www.cisco.com/go/cube> for full set of CUBE features. CUBE limitations on Cisco 88X are listed later in this document.
- Enhanced security, including:
  - Firewall with advance application and control for email, Instant Messaging (IM), and HTTP traffic
  - Site-to-site remote-access and dynamic VPN services: IP Security (IPsec) VPNs (Triple Data Encryption Standard [3DES] or Advanced Encryption Standard [AES]), Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN with onboard acceleration, and Secure Sockets Layer (SSL) VPN

- Intrusion prevention system (IPS): An inline, deep-packet inspection feature that effectively mitigates a wide range of network attacks
- Content filtering: A subscription-based integrated security solution that offers category-based reputation rating; keyword blocking; and protection against adware, malware, spyware, and URL blocking
- Four-port 10/100 Fast Ethernet managed switch with VLAN support; two ports support Power over Ethernet (PoE) for powering IP phones or external access points
- Secure 802.11g/n access-point option based on draft 802.11n standard with support for autonomous or Cisco Unified WLAN architectures
- CON/AUX port for console or external modem
- One USB 1.1 port for security eToken credentials, booting from USB, and loading configuration
- Easy setup, deployment, and remote-management capabilities through web-based tools and Cisco IOS® Software

Figure 1 shows a Cisco 881 Integrated Services Router.

**Figure 1.** Cisco 881 Integrated Services Router with Integrated 802.11n Access Point



Tables 1 and 2 list the routers that currently make up the Cisco 880 data and SRST series, respectively.

**Table 1.** Cisco 880 Series Data Models

Models	WAN Interface	LAN Interfaces	802.11g/n Option	Embedded 3G	Integrated ISDN Dial Backup
<b>Cisco 881</b>	10/100-Mbps Fast Ethernet	4-port 10/100-Mbps managed switch	Yes (Cisco 881W)	Yes (Cisco 881G)	-
<b>Cisco 886VA</b>	Multi-mode VDSL2/ADSL2/2+ over ISDN	4-port 10/100-Mbps managed switch	Yes (Cisco 886VAW)	Yes (Cisco 886VAG)	Yes
<b>Cisco 887VA</b>	Multi-mode VDSL2/ADSL2/2+ over POTS	4-port 10/100-Mbps managed switch	Yes (Cisco 887VAW)	Yes (Cisco 887VAG)	No
<b>Cisco 886</b>	ADSL2/2+ over ISDN (Annex B)	4-port 10/100-Mbps managed switch	Yes (Cisco 886W)	Yes (Cisco 886G)	Yes
<b>Cisco 887</b>	ADSL2/2+ over POTS (Annex A)	4-port 10/100-Mbps managed switch	Yes (Cisco 887W)	Yes (Cisco 887G)	Yes
<b>Cisco 887V</b>	VDSL2 over POTS	4-port 10/100-Mbps managed switch	Yes (Cisco 887V)	Yes (Cisco 887VG)	Yes
<b>Cisco 888</b>	G.SHDSL (ATM)	4-port 10/100-Mbps managed switch	Yes (Cisco 888W)	Yes (Cisco 888G)	Yes
<b>Cisco 888E</b>	G.SHDSL (EFM)	4-port 10/100-Mbps managed switch	Yes (Cisco 888W)	Yes (Cisco 888EG)	Yes

**Table 2.** Cisco 880 Series Voice Models

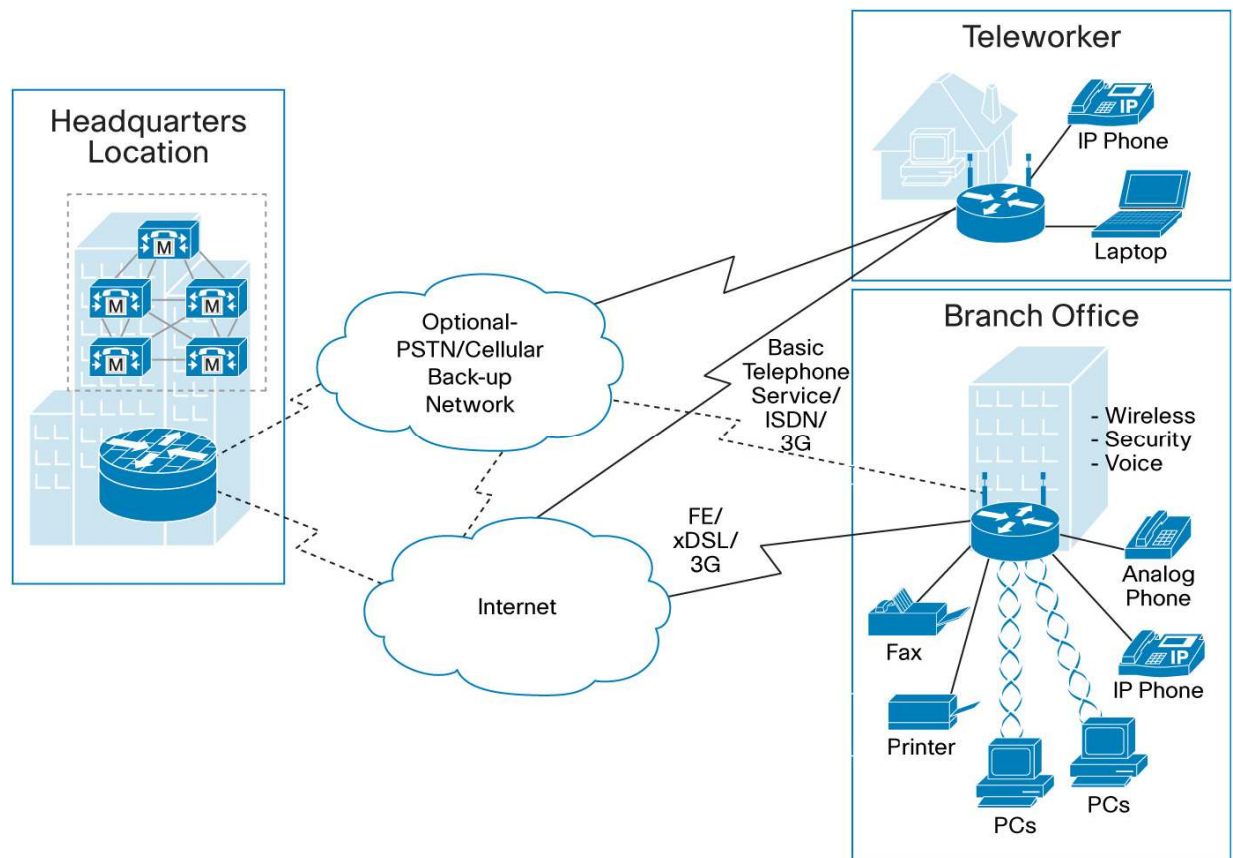
Models	WAN Interface	LAN Interfaces	Voice Ports	802.11g/n Option
<b>Cisco 881 SRST</b>	10/100-Mbps Fast Ethernet	4-port 10/100 Mbps managed switch	4 foreign-exchange-station (FXS) ports and 1 foreign-exchange-office (FXO) port for public-switched-telephone-network (PSTN) fallback	Yes (Cisco 881 SRSTW)
<b>Cisco 888 SRST</b>	G.SHDSL	4-port 10/100-Mbps managed switch	4 FXS ports and 1 Basic Rate Interface (BRI) port for PSTN fallback	Yes (Cisco 888 SRSTW)
<b>Cisco 881 CUBE</b>	10/100-Mbps Fast Ethernet	4-port 10/100-Mbps managed switch	No	No
<b>Cisco 886VA CUBE</b>	Multi-mode VDSL2/ADSL2/2+ over ISDN	4-port 10/100-Mbps managed switch	No	No
<b>Cisco 887VA CUBE</b>	Multi-mode VDSL2/ADSL2/2+ over POTS	4-port 10/100 Mbps managed switch	No	No
<b>Cisco 888E CUBE</b>	G.SHDSL (EFM)	4-port 10/100-Mbps managed switch	No	No
<b>Cisco 888 CUBE</b>	G.SHDSL (ATM)	4-port 10/100-Mbps managed switch	No	No

The Cisco 880 Series is ideal for small branch offices and teleworkers who need to be connected to larger enterprise networks as well as small businesses, for either voice or data applications. These routers help extend corporate networks to secure remote sites while giving users access to the same applications found in a corporate office. When users require WLAN access, visibility and control of network security are even more critical at the remote site. The Cisco 880 Series meets this need with a single device that combines integrated 802.11g/n capabilities with security features such as Wi-Fi Protected Access (WPA), including authentication with IEEE 802.1X with Cisco Extensible Authentication Protocol (LEAP) and Protected EAP (PEAP) and encryption with WPA Temporal Key Integrity Protocol (TKIP). (Refer to the wireless solution overview and security data sheet for more information. The Cisco 880 Series models that include the integrated access point can use either autonomous or Cisco Unified WLAN modes. In Cisco Unified WLAN mode, as part of an enterprise WLAN architecture, all WLAN functions are centrally managed through Cisco Wireless LAN Controllers and the Cisco Wireless Control System (WCS).

Service providers and value-added resellers can take advantage of the Cisco 880 Series to provide a true business-class broadband service. Business customers are using broadband access to connect to the Internet or to connect offices together, and they require a platform that incorporates security without sacrificing performance. Many of these customers are connecting computers in offices through WLANs; having a single device for both WAN and WLAN access provides a new option for managed services. These customers also require a higher level of support to keep their networks operational. Services with these customers should be simple to set up, while allowing a level of remote management and troubleshooting to quickly address support inquiries. The Cisco 880 Series meets the requirements of small offices and managed services providers.

Figure 2 shows deployment scenarios.

**Figure 2.** Deployment Scenarios



## Applications

The Cisco 880 Series is ideally suited for deployment in a small office or in a small office that is part of a large network, most often with a secure VPN connection. These types of offices can include the following:

- **Small remote office:** The Cisco 880 Series can connect users in a small remote office, such as an insurance, lawyer, or sales office. When connecting to the main office, VPN encryption and integrated security such as firewall and intrusion prevention protect the network at the perimeter. The Cisco 880 CUBE Series can also support connection to SIP trunking VOIP services provided by the Service Provider. Additionally, IT managers can centrally manage the remote site to quickly troubleshoot any network problems. For added reliability, customers can also use the integrated 3G or ISDN backup or connect through an external modem if the primary broadband link fails. Integrated secure unified WLAN connectivity simplifies the deployment and management devices at the remote site. Redundant WAN links offer business continuity, enabling non-disruptive business operation.

- **Virtual office:** The Cisco 880 Series is ideal for corporate teleworkers who have a mix of broadband connection types such as DSL, 3G, and Metro Ethernet. The Cisco 880 SRST Series provides a secure virtual office with all the collaborative services such as data, voice, and fax services. SRST helps ensure voice services are operational in case of WAN link failure, and redundant WAN links help ensure business continuity. QoS features in the Cisco 880 Series allow for connection of an IP or analog phone to the router, giving voice traffic precedence over data applications. Integrated WLAN support in the Cisco 880 Series helps ensure that if wireless connectivity is used it is secure. (Refer to Cisco Virtual Office Solution, <http://www.cisco.com/go/cvo>, for more information.)
- **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 880 Series, call-center agents can be dispersed away from costly call-center facilities while maintaining secure and productive voice and data access in their home. SRST and business-continuity solutions in the Cisco 880 Series provide reliability and continuous business operation. Alternatively, the remote call-center agent can be provided with SIP trunking service with service demarcation provided by CUBE features and the central call center can forward calls to the remote call-center agent through the remote office SIP trunk.
- **Retail VPN:** Retail stores migrating from dialup connections for point-of-sale transactions can use the Cisco 880 Series to take advantage of low-cost broadband access with the required security to comply with payment-card-industry (PCI) and other data security requirements. They can then add multiple devices and applications to the store network to take advantage of the increased bandwidth and also incorporate optional WLAN support to enable secure mobility and enhance productivity.
- **Managed services:** Service providers and value-added resellers can use the Cisco 880 Series as a platform to offer differentiated business-class security, voice and WLAN services for small business customers. The SIP trunking connectivity features of the Cisco 880 CUBE series router can provide the high quality VOIP service needed through the SP cloud.

## Features and Benefits

Table 3 lists the features and benefits of the Cisco 880 Series Integrated Services Routers.

**Table 3.** Features and Benefits of Cisco 880 Series Routers

Feature	Benefit
<b>Increased performance to run concurrent services</b>	<ul style="list-style-type: none"> <li>• Cisco 880 Series Router performance allows customers to take advantage of broadband network speeds while running secure, concurrent data, voice, video, and wireless services.</li> </ul>
<b>Enhanced security</b>	<ul style="list-style-type: none"> <li>• An integrated stateful and application inspection firewall provides network perimeter security.</li> <li>• High-speed IPsec 3DES and AES encryption offers data privacy over the Internet.</li> <li>• Intrusion prevention enforces security policy in a larger enterprise or service provider network.</li> <li>• Content filtering offers category-based URL classification and blocking, thus providing increased productivity and better use of company resources.</li> </ul>
<b>WAN Diversity</b>	<ul style="list-style-type: none"> <li>• Multiple WAN links: Fast Ethernet, Multi-mode VDSL2/ADSL2/2+, G.SHDSL, 3G, and ISDN.</li> </ul>
<b>Redundant WAN links</b>	<ul style="list-style-type: none"> <li>• Redundant WAN links provide business continuity and WAN diversity with</li> </ul>
<b>Four-port 10/100-Mbps managed switch</b>	<ul style="list-style-type: none"> <li>• The Cisco 880 Series allows for connection of multiple devices in a small office, with the ability to designate a port as the network edge.</li> <li>• An optional external PoE adapter powers IP phones and external access points to avoid individual power supplies or power injectors.</li> <li>• VLANs allow for secure segmentation of network resources.</li> </ul>

Feature	Benefit
<b>CON/AUX port</b>	<ul style="list-style-type: none"> <li>A single dual-purpose port provides direct connection to a console or external modem for management or backup access points.</li> </ul>
<b>Optional 802.11g/n access point</b>	<ul style="list-style-type: none"> <li>This broadband router offers a secure integrated access point in a single device.</li> <li>This integrated Wi-Fi access point offers IEEE 802.11n 2.0 standard support for mobile access to high-bandwidth data, voice, and video applications through the use of multiple-input, multiple-output (MIMO) technology that provides increased throughput, reliability, and predictability.</li> <li>The Cisco 880 Series supports both autonomous and unified modes.</li> </ul>
<b>Real-time clock</b>	<ul style="list-style-type: none"> <li>A built-in real-time clock maintains an accurate date and time for applications that require an accurate time stamp, such as logging and digital certificates.</li> </ul>
<b>SRST (supported on SRST voice models)</b>	<ul style="list-style-type: none"> <li>SRST provides business continuity for voice when the WAN link fails by switching calls to the PSTN.</li> </ul>
<b>CUBE (supported on CUBE voice models)</b>	<ul style="list-style-type: none"> <li>Support for SIP trunk connectivity, including demarcation and interworking, based on Cisco Unified Border Element feature license.</li> <li>Transcoding of Media is NOT supported on the Cisco 880 Series CUB E feature set.</li> </ul>
<b>Cisco Configuration Professional</b>	<ul style="list-style-type: none"> <li>Cisco Configuration Professional uses smart wizards and task-based tutorials, which resellers and customers can use to quickly and easily deploy, configure, and monitor a Cisco access router without requiring knowledge of the Cisco IOS Software command-line interface (CLI).</li> </ul>
<b>Unified wireless management</b>	<ul style="list-style-type: none"> <li>Configuration and management of access points is automated and simplified without manual intervention.</li> <li>A unified hybrid remote-edge access point (HREAP) provides the following: <ul style="list-style-type: none"> <li>WLAN services to remote and branch offices without deploying a wireless LAN controller at each location</li> <li>Central configuration and control of unified WLAN services for remote offices through a WAN link</li> <li>Flexibility in setting up wireless access at remote locations by specifying how traffic is to be bridged or tunneled</li> </ul> </li> </ul>

## Summary

Cisco 880 Series Integrated Services Routers combine increased network performance with advanced security to allow small-office customers to get the most from their broadband connections for both data and voice applications. With models supporting different broadband technologies such as DSL, 3G, and Metro Ethernet, the Cisco 880 Series can be deployed at any small-office location. Optional integrated 802.11g/n wireless capabilities provide true business-class WAN and WLAN access in a single solution. With the Cisco 880 Series, enterprise IT managers and service providers can take advantage of a solution that can be easily set up at the remote site and can be centrally managed to reduce ongoing operational costs.

## Product Specifications

### Cisco IOS Software Support

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

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

Models	Universal Image	Default Feature Set	First Cisco IOS Software Release
<b>Cisco 881</b>	Data	Advanced Security	12.4(20)T
<b>Cisco 881 SEC, Embedded 3G</b>	Data	Advanced IP	12.4(20)T, 15.1(4)M
<b>Cisco 881 SRST</b>	Voice	Advanced IP*	12.4(20)T
<b>Cisco 886VA and 887VA</b>	Data	Advanced Security	15.1(2)T
<b>Cisco 886VA and 887VA WLAN</b>	Data	Advanced Security	15.1(3)T
<b>Cisco 886VA and 887VA Embedded 3G</b>	Data	Advanced Security	15.1(4)M

Models	Universal Image	Default Feature Set	First Cisco IOS Software Release
Cisco 886 and 887	Data	Advanced Security	12.4(22)YB3
Cisco 886 and 887 SEC, 3G	Data	Advanced IP	12.4(22)YB3
Cisco 887V	Data	Advanced Security	12.4(22)YB, 12.4(24)T
Cisco 887V SEC, 3G	Data	Advanced IP	12.4(22)YB, 12.4(24)T
Cisco 887V WLAN	Data	Advanced Security	15.0(1)M
Cisco 887V 3G	Data	Advanced IP	15.0(1)M
Cisco 888	Data	Advanced Security	12.4(20)T
Cisco 888 SEC, 3G	Data	Advanced IP	12.4(20)T, 15.1(4)M
Cisco 888 SRST	Voice	Advanced IP*	12.4(20)T
Cisco 888E	Data	Advanced Security	15.1(1)T
Cisco 888E Embedded 3G	Data	Advanced IP	15.1(4)M
Cisco 881, 886VA, 887VA, 888, 888E CUBE	Voice	Advanced IP	15.1(4)M
Access-point software (ap801)	-	-	12.4(10b)JA3

\* Cisco 881 SRST and 888 SRST run the Cisco 880 voice universal image, which shares the same data and security features as the Advanced IP feature sets of Cisco 880 data models.

Tables 5 and 6 list software features of the Cisco 880 Series.


**Table 5.** Cisco IOS Software Features on Cisco 880 Series: Advanced Security Feature Set (Default)

Feature	Description
<b>IP and IP services features</b>	<ul style="list-style-type: none"> <li>• Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2)</li> <li>• Generic routing encapsulation (GRE) and Multipoint GRE (MGRE)</li> <li>• Cisco Express Forwarding</li> <li>• Standard 802.1d Spanning Tree Protocol</li> <li>• Layer 2 Tunneling Protocol (L2TP)</li> <li>• Network Address Translation (NAT)</li> <li>• Dynamic Host Configuration Protocol (DHCP) server, relay, and client</li> <li>• Dynamic Domain Name System (DNS)</li> <li>• DNS Proxy</li> <li>• DNS Spoofing</li> <li>• Access control lists (ACLs)</li> </ul>
<b>ATM features (ADSL and G.SHDSL ATM models only)</b>	<ul style="list-style-type: none"> <li>• ATM Variable Bit Rate real-time (VBR-rt)</li> <li>• ATM Unspecified Bit Rate (UBR), Constant Bit Rate (CBR), and Variable Bit Rate non-realtime (VBR-nrt)</li> <li>• ATM operations, administration, and maintenance (OA&amp;M) support for F5 Continuity Check; segment and end-to-end loopback; and Integrated Local Management Interface (ILMI) support</li> <li>• TX ring adjustment</li> <li>• Virtual-circuit (VC) bundling</li> <li>• Per-VC queuing</li> <li>• Per-VC traffic shaping</li> <li>• 10 ATM virtual circuits on the 886, 887, 888 models</li> <li>• 4 ATM virtual circuits on the 886VA and 887VA models</li> <li>• RFCs 1483 and 2684</li> <li>• Point-to-Point Protocol over ATM (PPPoA)</li> <li>• PPP over Ethernet (PPPoE)</li> </ul>
<b>Switch features</b>	<ul style="list-style-type: none"> <li>• Auto Media Device In/Media Device Cross Over (MDI-MDX)</li> <li>• Eight 802.1Q VLANs</li> <li>• MAC filtering</li> <li>• Two-port 802.3af and Cisco compliant PoE</li> <li>• Switched Port Analyzer (SPAN)</li> </ul>

Feature	Description
	<ul style="list-style-type: none"> <li>• Storm Control</li> <li>• Smartports</li> </ul>
<b>Security features</b>	Secure connectivity: <ul style="list-style-type: none"> <li>• Secure Sockets Layer (SSL) VPN for secure remote access</li> <li>• Hardware-accelerated DES, 3DES, AES 128, AES 192, and AES 256</li> <li>• Public-key-infrastructure (PKI) support</li> <li>• 20 IPsec tunnels</li> <li>• Cisco Easy VPN Client and Server</li> <li>• NAT transparency</li> </ul> Zone-based policy firewall: <ul style="list-style-type: none"> <li>• Stateful inspection transparent firewall</li> <li>• Advanced application inspection and control</li> <li>• HTTPS, FTP, and Telnet authentication proxy</li> <li>• Dynamic and static port security</li> </ul>
<b>QoS features</b>	<ul style="list-style-type: none"> <li>• Low-Latency Queuing (LLQ)</li> <li>• Weighted Fair Queuing (WFQ)</li> <li>• Class-Based WFQ (CBWFQ)</li> <li>• Class-Based Traffic Shaping (CBTS) (On Fast Ethernet WAN ports and DSL ports in Packet Transport Mode [PTM] only)</li> <li>• Class-Based Traffic Policing (CBTP)</li> <li>• Policy-Based Routing (PBR)</li> <li>• Class-Based QoS MIB</li> <li>• Class of service (CoS)-to-differentiated services code point (DSCP) mapping</li> </ul>
<b>Management features</b>	<ul style="list-style-type: none"> <li>• Cisco Configuration Professional</li> <li>• Cisco Configuration Express</li> <li>• Cisco Configuration Engine support</li> <li>• Cisco AutoInstall</li> <li>• IP service-level agreement (SLA)</li> <li>• Cisco IOS Embedded Event Manager (EEM)</li> <li>• CiscoWorks</li> <li>• Cisco Security Manager</li> <li>• Telnet, Simple Network Management Protocol Version 3 (SNMPv3), Secure Shell (SSH) Protocol, CLI, and HTTP management</li> <li>• RADIUS and TACACS+</li> <li>• Out-of-band management with ISDN S/T port or external modem through virtual auxiliary port</li> <li>• Cisco Wireless Control System (WCS) for management of unified access points in models supporting WLAN</li> </ul>
<b>High-availability features</b>	<ul style="list-style-type: none"> <li>• Virtual Router Redundancy Protocol (VRRP) (RFC 2338)</li> <li>• Hot Standby Router Protocol (HSRP)</li> <li>• Multigroup HSRP (MHSRP)</li> <li>• Dial backup with external modem through virtual auxiliary port</li> <li>• Dial backup with ISDN S/T port (select DSL models only)</li> <li>• 3G backup (3G models only)</li> </ul>
<b>Number of recommended users</b>	20

**Table 6.** Cisco IOS Software Features on Cisco 880 Series: WLAN Features (Available with Wireless Option)

Feature	Description
<b>WLAN hardware</b>	<ul style="list-style-type: none"> <li>• IEEE 802.11n draft 2.0 standards-based access point with 802.11 b/g compatibility</li> <li>• Automatic rate selection for 802.11g/n</li> <li>• Captive omnidirectional 2-dBi gain dipole antennas</li> <li>• 2 x 3 MIMO radio operation</li> <li>• Removable antennas on Cisco 881W models</li> <li>• Wi-Fi 802.11n Draft v2.0 certified</li> </ul>

Feature	Description
<b>WLAN software features</b>	<ul style="list-style-type: none"> <li>• Autonomous or unified access point</li> <li>• Cisco WCS support for monitoring of autonomous-mode access points</li> <li>• Option to maximize throughput or maximize range</li> <li>• Software-configurable transmit power</li> <li>• Radio roles, including access point, root bridge, nonroot bridge, and workgroup bridge</li> <li>• Wi-Fi Multimedia (WMM) certification</li> <li>• Traffic specifications (TSPEC) Call Admission Control (CAC) to ensure voice quality is maintained</li> <li>• Unscheduled Automatic Power Save Delivery (UPSD) to reduce latency</li> </ul>
<b>WLAN security features</b>	<ul style="list-style-type: none"> <li>• Standard 802.11i</li> <li>• WPA and AES (WPA2)</li> <li>• EAP authentication: Cisco LEAP, PEAP, Extensible Authentication Protocol Transport Layer Security (EAP TLS), Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST), Extensible Authentication Protocol-Subscriber Information Module (EAP-SIM), Extensible Authentication Protocol-Message Digest Algorithm 5 (EAP-MD5), and Extensible Authentication Protocol-Tunneled TLS (EAP-TTLS)</li> <li>• Static and dynamic Wired Equivalent Privacy (WEP)</li> <li>• Temporal Key Integrity Protocol/Simple Security Network (TKIP/SSN) encryption</li> <li>• MAC authentication and filter</li> <li>• User database for survivable local authentication using LEAP and EAP-FAST</li> <li>• Configurable limit to the number of wireless clients</li> <li>• Configurable RADIUS accounting for wireless clients</li> <li>• Pre-Shared Keys (PSKs) (WPA-small office or home office [WPA-SOHO])</li> </ul>
<b>Certifications</b>	
<b>Service set identifiers (SSIDs)</b>	16
<b>Wireless VLANs</b>	8
<b>Encrypted wireless VLANs</b>	8
<b>Multiple broadcast service set identifiers (MBSSIDs)</b>	16

### Cisco IOS Software Advanced IP Services Feature Set (Optional Software Upgrade)

The Advanced IP Services software image has all the features of the Advanced Security software image with the addition of the features listed in Tables 7 and 8.

**Table 7.** Cisco IOS Software Features on Cisco 880 Series: Advanced IP Services Feature Set (Optional Software Upgrade)

Feature	Description
<b>IP and IP services features</b>	<ul style="list-style-type: none"> <li>• IPv4 and IPv6 Multicast</li> <li>• Open Shortest Path First (OSPF)</li> <li>• Border Gateway Protocol (BGP)</li> <li>• Enhanced Interior Gateway Routing Protocol (EIGRP)</li> <li>• Virtual Route Forwarding (VRF) Lite</li> <li>• Next Hop Resolution Protocol (NHRP)</li> <li>• Layer 2 Tunneling Protocol Version 3 (L2TPv3)</li> <li>• Bidirectional Forwarding Detection (BFD)</li> <li>• Web Cache Communication Protocol (WCCP)</li> </ul>
<b>Switch features</b>	<ul style="list-style-type: none"> <li>• Internet Group Management Protocol Version 3 (IGMPv3) snooping</li> <li>• 802.1x</li> </ul>
<b>Security features</b>	Secure connectivity: <ul style="list-style-type: none"> <li>• DMVPN</li> <li>• Tunnel-less Group Encrypted Transport VPN</li> <li>• IPsec stateful failover</li> </ul>

Feature	Description
	<ul style="list-style-type: none"> <li>• VRF-aware IPsec</li> <li>• IPsec over IPv6</li> <li>• Adaptive control technology</li> <li>• Session Initiation Protocol (SIP) application layer gateway</li> </ul> <p>Cisco IOS Firewall:</p> <ul style="list-style-type: none"> <li>• Firewall stateful failover</li> <li>• VRF-aware firewall</li> </ul> <p>Content Filtering:</p> <ul style="list-style-type: none"> <li>• Subscription-based content filtering with Trend Micro</li> <li>• Support for Websense and Smartfilter</li> <li>• Cisco IOS Software black and white lists</li> </ul> <p>Integrated threat control:</p> <ul style="list-style-type: none"> <li>• IPS</li> <li>• Control Plane Policing</li> <li>• Flexible Packet Matching</li> <li>• Network foundation protection</li> </ul>
<b>QoS features</b>	<ul style="list-style-type: none"> <li>• Class-Based Weighted Random Early Detection (CBWRED)</li> <li>• Network-Based Application Recognition (NBAR)</li> <li>• Link fragmentation and interleaving (LFI)</li> <li>• Resource Reservation Protocol (RSVP)</li> <li>• Real-Time Transport Protocol (RTP) header compression (cRTP)</li> <li>• Differentiated Services (DiffServ)</li> <li>• QoS preclassify and prefragmentation</li> <li>• Hierarchical QoS (HQoS)</li> </ul>
<b>Metro Ethernet features</b>	<ul style="list-style-type: none"> <li>• Ethernet Operations, Administration, and Maintenance (Ethernet OAM)</li> <li>• Ethernet Local Management Interface (Ethernet LMI)</li> <li>• HQoS</li> </ul>
<b>IPv6 features</b>	<ul style="list-style-type: none"> <li>• IPv6 addressing architecture</li> <li>• IPv6 name resolution</li> <li>• IPv6 statistics</li> <li>• IPv6 translation: Transport packets between IPv6-only and IPv4-only endpoints (NAT-PT)</li> <li>• Internet Control Message Protocol Version 6 (ICMPv6)</li> <li>• IPv6 DHCP</li> </ul>
<b>Unified WLAN management</b>	<p>Unified access-point features:</p> <ul style="list-style-type: none"> <li>• Supported by wireless LAN controller and Cisco WCS</li> <li>• Configurable local or central switching for HREAP mode</li> <li>• Radio management through Cisco WCS</li> <li>• Transparent roaming with Mobility Groups</li> </ul>

**Table 8.** Cisco IOS Software Features on Cisco 880 SRST Series: Advanced IP Services Feature Set

Feature	Description
<b>Cisco SRST version</b>	SRST 7.0 and later are supported.
<b>Call-control signaling</b>	H.323 Versions 1, 2, 3, and 4, Media Gateway Control Protocol (MGCP) 0.1 and 1.0, Skinny Client Control Protocol (SCCP), and SIP call-control protocols are supported.
<b>ITU standard voice codecs</b>	G.711, G.729, G.729a/b, G.723.1, G.726, and G.728, which are standards-based compression technologies allowing transmission of voice across IP, are supported. The G.711 standard employs 64-kbps pulse code modulation (PCM) using either mu-law or a-law. Other codecs employ lower bit rates.
<b>Cisco Unified Communications Manager support</b>	<p>For SRST features for IP phones, refer to the SRST data sheet at: <a href="http://www.cisco.com/en/US/products/sw/voicesw/ps2169/products_data_sheets_list.html">http://www.cisco.com/en/US/products/sw/voicesw/ps2169/products_data_sheets_list.html</a>.</p> <p>Cisco Unified Communications Manager support for analog and digital ports come with Releases 6.1(3), 7.0(2), and 7.1(3).</p>

Feature	Description
<b>Telephony interface signaling support</b>	<p>Cisco 880 SRST supports the following signaling protocols:</p> <ul style="list-style-type: none"> <li>• FXS loop-start and ground-start signaling</li> <li>• FXO</li> <li>• Inbound signaling (such as dual-tone multifrequency [DTMF] and multifrequency support)</li> <li>• BRI QSIG</li> </ul>
<b>Voice features</b>	<ul style="list-style-type: none"> <li>• Echo cancellation: This feature cancels echo on tail circuits up to 64 msec (configurable tail length).</li> <li>• Silence suppression and voice activity detection (VAD): Bandwidth is used only when someone is speaking. During silent periods of a phone call, bandwidth is available for data traffic.</li> <li>• Comfort-noise generation: This feature reassures the phone user that the connection is being maintained, even when no voice packets are being transmitted.</li> <li>• Caller ID support: Per-port caller ID (with per-call unblocking) is configurable over analog FXS.</li> <li>• Dial-plan mapping: This feature simplifies configuration and management through automatic mapping of dialed phone numbers to IP addresses.</li> </ul>
<b>Voice port-specific features</b>	<ul style="list-style-type: none"> <li>• FXS: FXS provides battery polarity reversal detection and initiation for disconnect supervision and far-end answer supervision.</li> <li>• ISDN BRI network side and phantom power: The BRI port provides the ability to connect a private branch exchange (PBX) or private automatic branch exchange (PABX) configured as user side directly to the router. It also provides phantom power to accommodate equipment that requires it.</li> <li>• LED indicators show voice-processing resources and port status.</li> </ul>
<b>Fax and modem</b>	<ul style="list-style-type: none"> <li>• Fax and modem pass-through allows fax and modem traffic to pass through a voice port.</li> <li>• Fax Relay provides a more robust protocol for fax transmission over packet networks. It also supports the T.37 and T.38 fax protocols.</li> </ul>
<b>High-performance flexible digital-signal-processor (DSP) architecture</b>	<ul style="list-style-type: none"> <li>• Channel capacity: Cisco 880 SRST supports up to four voice channels.</li> <li>• Flexible DSP architecture: There is no need to specify codec complexity at configuration. An appropriate codec is dynamically selected when a call is established, while allocating DSP resources optimally.</li> <li>• Feature upgrades: The DSP architecture allows for addition of new features through simple code updates.</li> </ul>

**Table 9.** Cisco IOS Software Features on Cisco 880 CUBE Series: Advanced IP Services Feature Set

Feature	Description
<b>Cisco CUBE version</b>	CUBE 7.0 and later are supported.
<b>Call-control signaling</b>	H.323 Versions 1, 2, 3, and 4, Media Gateway Control Protocol (MGCP) 0.1 and 1.0, Skinny Client Control Protocol (SCCP), and SIP call-control protocols are supported.
<b>ITU standard voice codecs</b>	G.711, G.729, G.729a/b, G.723.1, G.726, and G.728, which are standards-based compression technologies allowing transmission of voice across IP, are supported. The G.711 standard employs 64-kbps pulse code modulation (PCM) using either mu-law or a-law. Other codecs employ lower bit rates.
<b>Cisco Unified Communications Manager support</b>	<p>For SRST features for IP phones, refer to the SRST data sheet at: <a href="http://www.cisco.com/en/US/products/sw/voicesw/ps2169/products_data_sheets_list.html">http://www.cisco.com/en/US/products/sw/voicesw/ps2169/products_data_sheets_list.html</a>.</p> <p>Cisco Unified Communications Manager support for analog and digital ports come with Releases 6.1(3), 7.0(2), and 7.1(3).</p>
<b>Telephony interface signaling support</b>	<p>Cisco 880 SRST supports the following PSTN trunk signaling protocols:</p> <ul style="list-style-type: none"> <li>• FXS loop-start and ground-start signaling</li> <li>• FXO</li> <li>• Inbound signaling (such as dual-tone multifrequency [DTMF] and multifrequency support)</li> <li>• BRI QSIG</li> </ul> <p>Cisco 880 CUBE supports the following VOIP trunk signaling protocols:</p> <ul style="list-style-type: none"> <li>• Up to 15 SIP to SIP sessions. (no H323 support)</li> <li>• NOTE: Cisco 880 CUBE does NOT include DSP feature support, such as transcoding or transrating</li> <li>• NOTE: Cisco 880 CUBE does NOT support concurrent operation of SRST or CME</li> </ul>


Feature	Description
<b>Voice features</b>	<ul style="list-style-type: none"> <li>• Echo cancellation: This feature cancels echo on tail circuits up to 64 msec (configurable tail length).</li> <li>• Silence suppression and voice activity detection (VAD): Bandwidth is used only when someone is speaking. During silent periods of a phone call, bandwidth is available for data traffic.</li> <li>• Comfort-noise generation: This feature reassures the phone user that the connection is being maintained, even when no voice packets are being transmitted.</li> <li>• Caller ID support: Per-port caller ID (with per-call unblocking) is configurable over analog FXS.</li> <li>• Dial-plan mapping: This feature simplifies configuration and management through automatic mapping of dialed phone numbers to IP addresses.</li> </ul>
<b>Voice port-specific features</b>	<ul style="list-style-type: none"> <li>• FXS: FXS provides battery polarity reversal detection and initiation for disconnect supervision and far-end answer supervision.</li> <li>• ISDN BRI network side and phantom power: The BRI port provides the ability to connect a private branch exchange (PBX) or private automatic branch exchange (PABX) configured as user side directly to the router. It also provides phantom power to accommodate equipment that requires it.</li> <li>• LED indicators show voice-processing resources and port status.</li> </ul>

## System Specifications

Tables 9 and 10 list the system specifications for the Cisco 880 Series Routers.

**Table 10.** System Specifications

Feature	Description
<b>Default DRAM</b>	<ul style="list-style-type: none"> <li>• 256 MB on Cisco 880 Series data models</li> <li>• 512 MB on Cisco 880 Series WLAN, Embedded 3G WWAN, and SRST/CUBE models</li> </ul>
<b>Maximum DRAM</b>	<ul style="list-style-type: none"> <li>• 768 MB on Cisco 880 Series data and CUBE models</li> <li>• 1024 MB on Cisco 880 Series WLAN</li> </ul>
<b>Default and maximum flash memory</b>	<ul style="list-style-type: none"> <li>• 128 MB on Cisco 880 Series data, Embedded 3G WWAN and CUBE models</li> <li>• 256 MB on Cisco 880 Series SRST models</li> </ul>
<b>WAN</b>	<ul style="list-style-type: none"> <li>• Fast Ethernet</li> <li>• Multi-mode VDSL2 and ADSL2/2+ over ISDN with ISDN backup</li> <li>• Multi-mode VDSL2 and ADSL2/2+ over POTS</li> <li>• ADSL2/2+ over ISDN with ISDN backup</li> <li>• ADSL2/2+ over POTS with ISDN backup</li> <li>• VDSL2 over POTS with ISDN backup</li> <li>• G.SHDSL (2- and 4-wire support) with ISDN backup</li> <li>• Fast Ethernet and 3G WAN for Code Division Multiple Access (CDMA) and high-speed downlink packet access (HSDPA)</li> </ul>
<b>LAN switch</b>	Managed 4-port 10/100BASE-T with autosensing MDI/MDX for auto crossover
<b>Standard 802.11g/n access point based on IEEE 802.11n draft 2.0 standard</b>	Optional on all models
<b>Console or auxiliary port</b>	RJ-45
<b>One USB 1.1 port for advanced security features such as security tokens or USB flash memory</b>	<ul style="list-style-type: none"> <li>• One USB 1.1 port on Cisco 880 Series Routers</li> <li>• USB devices supported: <ul style="list-style-type: none"> <li>◦ USB eTokens</li> <li>◦ USB flash memory</li> </ul> </li> </ul> <p><b>Note:</b> USB 1.1 port cannot be used for connecting external devices other than those specified at: <a href="http://www.cisco.com/en/US/prod/collateral/modules/ps6247/product_data_sheet0900aecd80232473.html">http://www.cisco.com/en/US/prod/collateral/modules/ps6247/product_data_sheet0900aecd80232473.html</a>.</p>
<b>ISDN BRI S/T</b>	Available on: <ul style="list-style-type: none"> <li>• Cisco 886, 886VA, 887, 887V, and 888 for out-of-band management and dial backup or primary</li> </ul>
<b>3G express card modem</b>	Available on: <ul style="list-style-type: none"> <li>• Cisco 881G, 886G, 887G, 887VG, and 888G for out-of-band management and backup or primary</li> <li>• Cisco 888G for out-of-band management and backup or primary</li> </ul> <p><b>Note:</b> Cisco 887VG currently ships with HSPA modem only.</p>
<b>External power supply</b>	Universal 100 to 240 VAC input; 60W, 12 VDC output

Feature	Description
<b>Physical dimensions and weight</b>	<p>Product dimensions, nonwireless models:</p> <ul style="list-style-type: none"> <li>• H x W x D = 1.9 x 12.8 x 9.8 in. (48 x 325 x 249 mm) (includes rubber feet)</li> <li>• H x W x D = 1.75 x 12.8 x 9.8 in. (44 x 325 x 249 mm) (without rubber feet)</li> </ul> <p>Product dimensions, wireless models:</p> <ul style="list-style-type: none"> <li>• H x W x D = 1.9 x 12.8 x 10.4 in. (48 x 325 x 264 mm) (includes rubber feet)</li> <li>• H x W x D = 1.75 x 12.8 x 10.4 in. (44 x 325 x 264 mm) (without rubber feet; excludes antennas)</li> <li>• Weight: 5.5 lb (2.5 kg) maximum</li> </ul>
<b>Power</b>	<p>Product power specifications:</p> <ul style="list-style-type: none"> <li>• AC input voltage: 100 to 240 VAC</li> <li>• Frequency: 50 to 60 Hz</li> <li>• Maximum output power: 60W</li> <li>• Output voltages: 12 VDC</li> </ul> <p>Optional internal PoE with external adapter:</p> <ul style="list-style-type: none"> <li>• Maximum output power: 80W</li> <li>• External output voltage: 48 VDC</li> </ul>
<b>Approvals and compliance</b>	<p>Emissions:</p> <ul style="list-style-type: none"> <li>• 47 CFR Part 15: 2006</li> <li>• CISPR22: 2005</li> <li>• EN300386: V1.3.3: 2005</li> <li>• EN55022: 2006</li> <li>• EN61000-3-2: 2000 [Inc amd 1 and 2]</li> <li>• EN61000-3-3: 1995 [+ amd 1: 2001]</li> <li>• ICES-003 Issue 4: 2004</li> <li>• KN 22: 2005</li> <li>• VCCI: V-3/2006.04</li> </ul> <p>Immunity:</p> <ul style="list-style-type: none"> <li>• CISPR24: 1997 [+ amd 1 and 2]</li> <li>• EN300386: V1.3.3: 2005</li> <li>• EN50082-1: 1992</li> <li>• EN50082-1: 1997</li> <li>• EN55024: 1998 [+ amd 1 and 2]</li> <li>• EN61000-6-1: 2001</li> </ul> <p>The following are supported on teleworker models:</p> <ul style="list-style-type: none"> <li>• AS/NRZ 3548: 1992 Class B</li> <li>• CFR 47 Part 15 Class B</li> <li>• EN60555-2 Class B</li> <li>• EN55022 Class B</li> <li>• ICES-003, Issue 2, Class B, April 1997S</li> </ul>
<b>Certifications</b>	
<b>Environmental operating range</b>	<ul style="list-style-type: none"> <li>• Nonoperating temperature: -4 to 149°F (-20 to 65°C)</li> <li>• Nonoperating humidity: 5 to 95% relative humidity (noncondensing)</li> <li>• Nonoperating altitude: 0 to 15,000 ft (0 to 4570m)</li> <li>• Operating temperature <ul style="list-style-type: none"> <li>◦ At sea level: 32 to 104°F (0 to 40°C)</li> <li>◦ Up 10,000ft: 32 to 77 °F (0 - 25°C)</li> <li>◦ Derating 2.7°F/10000ft (1.5°C/1000ft)</li> </ul> </li> <li>• Operating humidity: 10 to 85% relative humidity (noncondensing)</li> <li>• Operating altitude: 0 to 10,000 ft (0 to 3000m)</li> </ul>

**Table 11.** Wireless LAN and 3G Specifications

SRST Specifications	
<b>SRST Specifications</b>	<ul style="list-style-type: none"> <li>• Packet fax and voice DSP module PVDM2-16</li> </ul> <p>FXS voice-port specifications:</p> <ul style="list-style-type: none"> <li>• Tip and ring interfaces for each FXS port (subscriber line interface card [SLIC])</li> <li>• Ring voltage</li> <li>• Ring frequency</li> <li>• Ring waveform</li> <li>• Ring load</li> <li>• Ringer Equivalence Number (REN)</li> <li>• Loop resistance</li> <li>• On- and off-hook characteristics</li> <li>• On-hook voltage (tip and ring)</li> <li>• Off-hook current</li> <li>• RJ-11 FXS port terminating impedance option</li> </ul> <p>BRI voice-port specifications:</p> <ul style="list-style-type: none"> <li>• Interface type</li> <li>• Compliance</li> <li>• Safety conformance</li> <li>• ITU compliance</li> <li>• Interface</li> <li>• ISDN digital access</li> <li>• Physical connector</li> <li>• Phantom power</li> </ul>
Wireless Specifications	
<b>Radio frequency band</b>	<ul style="list-style-type: none"> <li>• 2.4 GHz</li> </ul>
<b>Data rates supported</b>	<ul style="list-style-type: none"> <li>• 802.11b: 1, 2, 5.5, 6, 9, and 11 Mbps</li> <li>• 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps</li> <li>• 802.11n: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, and m0-m15</li> </ul>
<b>Maximum transmit power (2-channel aggregate)</b>	<p>Note: Maximum power setting is subject to changes by channel and by region, depending on regulations.</p> <ul style="list-style-type: none"> <li>• 802.11b 20 dBm</li> <li>• 802.11g 17 dBm</li> <li>• 802.11n 16 dBm</li> </ul>
3G specifications	
<b>Data rates</b>	<ul style="list-style-type: none"> <li>• CDMA: 850 and 1900 MHz</li> <li>• HSDPA: 850, 900, 1900, and 2100 MHz</li> </ul>

## DSL Specifications

Tables 11, 12, 13, 14, 15, and 16 list the DSL features specifications and DSL access multiplexer (DSLAM) interoperability support for the Cisco 880 Series Routers. For more information and details about DSLAM and linecard interoperability, please refer to the following document: [What Is Cisco ISR and ISR G2 xDSL Interoperability?](#)

**Table 12.** DSL Features Specifications

DSL Specifications	
<b>Multi-mode DSL (VDSL2 and ADSL2/2+)</b> <b>(886VA, 887VA models)</b>	<ul style="list-style-type: none"> <li>• Broadcom Chipset</li> <li>• Dying gasp</li> <li>• IEEE 802.1q VLAN tagging</li> <li>• Independent DSL firmware loading</li> </ul> <p>VDSL2</p> <ul style="list-style-type: none"> <li>• ITU G.993.2 (VDSL2)</li> <li>• 997 and 998 band plans</li> <li>• VDSL2 profiles: 8a, 8b, 8c, 8d, 12a, 12b, and 17a</li> <li>• U0 band support (25KHz - 276 KHz)</li> <li>• Ethernet Packet Transport Mode (PTM) mode only based on IEEE 802.3ah 64/65 octet encapsulation</li> <li>• DELT Diagnostics Mode</li> </ul> <p>ADSL2/2+</p> <ul style="list-style-type: none"> <li>• ADSL over basic telephone service with Annex A and Annex B ITU G. 992.1 (ADSL), G.992.3 (ADSL2), and G.992.5 (ADSL2+)</li> <li>• ADSL over basic telephone service with Annex M (extended upstream bandwidth) G.992.3 (ADSL2) and G.992.5 (ADSL2+) <ul style="list-style-type: none"> <li>◦ Cisco 887VA-M is optimized for PSD Mask EU-64 M9.</li> <li>◦ Cisco 887VA-M supports UK Annex M</li> </ul> </li> <li>• G.994.1 ITU G.hs</li> <li>• Reach-extended ADSL2 (G.922.3) Annex L for increased performance on loop lengths greater than 16,000 feet from central office</li> <li>• T1.413 ANSI ADSL DMT issue 2 compliance</li> <li>• DSL Forum TR-067comformity</li> <li>• Impulse Noise Protection (INP) ane extended INP</li> <li>• Downstream Power Back Off (DPBO)</li> <li>• ATM mode only</li> </ul>
<b>ADSL specifications</b> <b>(886, 887 models)</b>	<ul style="list-style-type: none"> <li>• ST-Microelectronics 20190 Chipset</li> <li>• ADSL over basic telephone service with Annex A and Annex B ITU G. 992.1 (ADSL), G.992.3 (ADSL2), and G.992.5 (ADSL2+)</li> <li>• ADSL over basic telephone service with Annex M (extended upstream bandwidth) G.992.3 (ADSL2) and G.992.5 (ADSL2+). <ul style="list-style-type: none"> <li>◦ Cisco 887-M is optimized for PSD Mask EU-64 M9</li> <li>◦ Cisco 887M supports UK Annex M only with Huawei 5300 DSLAM and its EADB line card with customer-premises-equipment (CPE) firmware Version 4.0.17</li> </ul> </li> <li>• G.994.1 ITU G.hs.</li> <li>• Reach-extended ADSL2 (G.922.3) Annex L for increased performance on loop lengths greater than 16,000 feet from central office</li> <li>• T1.413 ANSI ADSL DMT issue 2 compliance</li> <li>• DSL Forum TR-067 conformity</li> <li>• Does not provide interoperability with carrierless amplitude modulation/phase modulation (CAP)-based ADSL lines</li> <li>• Dying gasp</li> <li>• IEEE 802.1q VLAN tagging with IOS release 15.1(1)T or later</li> </ul>
<b>VDSL2 specifications</b> <b>(887V models)</b>	<ul style="list-style-type: none"> <li>• Broadcom Chipset</li> <li>• ITU G.993.2 (VDSL2) over basic telephone service only</li> <li>• 997 and 998 band plans, over basic telephone service only</li> <li>• VDSL2 profiles supported: 8a, 8b, 8c, 8d, 12a, 12b, and 17a</li> <li>• U0 band support (25KHz - 276 KHz)</li> <li>• Ethernet Packet Transport Mode (PTM) mode only based on IEEE 802.3ah 64/65 octet encapsulation</li> <li>• DELT Diagnostics Mode</li> <li>• IEEE 802.1q VLAN tagging</li> </ul>

DSL Specifications	
<b>G.SHDSL (ATM mode) specifications (Cisco 888)</b>	<ul style="list-style-type: none"> <li>• Conexant/Ikanos Chipset</li> <li>• 2- and 4-wire modes</li> <li>• Symmetrical WAN speeds up to 2.304 Mbps over a single copper pair and up to 4.608 Mbps over two copper pairs using ITU-T G.991.2 Annex A and Annex B</li> <li>• Wetting current (Section A.5.3.3 of G.991.2)</li> <li>• Dying gasp; uses power status bit (Section 7.1.2.5.3 of G.991.2) for signaling</li> </ul>
<b>G.SHDSL (EFM mode) specifications (Cisco 888E)</b>	<ul style="list-style-type: none"> <li>• Conexant/Ikanos Chipset</li> <li>• 2-wire mode</li> <li>• Offers symmetrical WAN speeds up to 2.304 Mbps over a single copper pair using ITU-T G.991.2 Annex A and Annex B</li> <li>• Symmetrical WAN speeds from 768 kbps to 5.696 Mbps over a single copper pair using ITU-T G.991.2 Annex F and Annex G</li> <li>• Symmetrical WAN speeds up to 22.784 Mbps over four copper pairs using IEEE 802.3ah EFM bonding</li> <li>• Wetting current (Section A.5.3.3 of G.991.2)</li> <li>• Dying gasp; uses power status bit (Section 7.1.2.5.3 of G.991.2) for signaling</li> <li>• Rate adaption</li> </ul>

**Table 13.** Multi-mode DSL DSLAM Interoperability for Cisco 887VA

DSLAM	VDSL2 over POTS Line Card Chipset
<b>ZTE 9806</b>	Broadcom
<b>Huawei MA5600</b>	Broadcom

**Table 14.** Multi-mode DSL DSLAM Interoperability for Cisco 886VA

Siemens HIX 5300	Infineon
<b>ECI 480</b>	Infineon
<b>Alcatel ASAM 7300</b>	Globespan

**Table 15.** ADSL-over-ISDN DSLAM Interoperability for Cisco 886

DSLAM	ADSL2/2+ over ISDN Line-Card Chipset
<b>Siemens HIX 5300</b>	Infineon
<b>ECI 480</b>	Infineon
<b>Alcatel ASAM 7300</b>	Globespan

**Table 16.** ADSL over Basic Telephone Service DSLAM Interoperability for Cisco 887 and 887M

DSLAM	ADSL2/2+ over Basic Telephone Service Line-Card Chipset
<b>Alcatel ASAM 7300</b>	Broadcom (Annex A and Annex M)
<b>ECI 480</b>	Infineon (Annex A and Annex M)
<b>Ericsson</b>	Broadcom (Annex A and M)
<b>Huawei 5600</b>	Globespan (Annex A only)
<b>Lucent Stinger</b>	Globespan (Annex A and Annex M)

**Table 17.** VDSL2 DSLAM Interoperability for Cisco 887V

DSLAM	VDSL2 over POTS Line Card Chipset
<b>ZTE 9806</b>	Broadcom
<b>Huawei MA5600</b>	Broadcom

**Table 18.** G.SHDSL DSLAM Interoperability for Cisco 888

DSLAM	G.SHDSL (2 wire and 4 wire) Line Card Chipset
ECI Hi-Focus SAM 480	Infineon
Alcatel ASAM7300	Conexant/Ikanos
Lucent Stinger	Conexant/Ikanos
Siemens Hix-5300	Infineon

**Table 19.** G.SHDSL DSLAM Interoperability for Cisco 888E

DSLAM	G.SHDSL (2- and 4-wire) Line-Card Chipset
Huawei 5603	Infineon
Alcatel ISAM 7302	Infineon
Hatteras HN4000e	Infineon

## Ordering Information

Table 19 lists ordering information for the Cisco 880 Series. To place an order, visit the Cisco ordering homepage.

**Table 20.** Ordering Information

Part Number	Product Name
<b>Ethernet</b>	
CISCO881-K9	Cisco 881 Ethernet Security Router
C881-CUBE-K9	Cisco 881 Ethernet Security Router with integrated CUBE Licenses
CISCO881-SEC-K9	Cisco 881 Ethernet Security Router with Advanced IP Services
CISCO881W-GN-A-K9	Cisco 881 Ethernet Security Router with 802.11n FCC Compliant
CISCO881W-GN-E-K9	Cisco 881 Ethernet Security Router with 802.11n ETSI Compliant
CISCO881W-GN-P-K9	Cisco 881 Ethernet Security Router with 802.11n Japan Compliant
<b>Ethernet and 3G</b>	
CISCO881G-K9	Cisco 881 Ethernet Security Router with 3G
CISCO881GW-GN-A-K9	Cisco 881 Ethernet Security Router with 3G, 802.11n FCC Compliant
CISCO881GW-GN-E-K9	Cisco 881 Ethernet Security Router with 3G, 802.11n ETSI Compliant
CISCO881G-S-K9	Cisco 881G Ethernet Security Router with 3G Sprint
CISCO881G-V-K9	Cisco 881G Ethernet Security Router with 3G Verizon
CISCO881G-A-K9	Cisco 881G Ethernet Security Router with 3G GSM North America
C881G-U-K9	Secure Router with WAN FE and Embedded 3.5G HSPA with SMS/GPS
C881G-S-K9	Secure Router with WAN FE and Embedded 3G EVDO Rev A with SMS/GPS for Sprint Networks
C881G-V-K9	Secure Router with WAN FE and Embedded 3G EVDO Rev A with SMS/GPS for Verizon Wireless Networks
C881G-B-K9	Secure Router with WAN FE and Embedded 3G EVDO Rev A with SMS/GPS for BSNL Networks
C881G+7-K9	Secure Router with WAN FE and Embedded 3.7G HSPA+ Release 7 with SMS/GPS
C881G+7-A-K9	Secure Router with WAN FE and Embedded 3.7G HSPA+ Release 7 with SMS/GPS for AT&T Networks
<b>Multi-mode DSL (VDSL2 and ADSL2+)</b>	
CISCO886VA-K9	Cisco 886VA router with VDSL2/ADSL2+ over ISDN
CISCO886VA-SEC-K9	Cisco 886VA Secure router with VDSL2/ADSL2+ over ISDN
C886VA-CUBE-K9	Cisco 886VA Secure router with VDSL2/ADSL2+ over ISDN and integrated CUBE licenses
CISCO887VA-K9	Cisco 887VA router with VDSL2/ADSL2+ over POTS

Part Number	Product Name
<b>CISCO887VA-SEC-K9</b>	Cisco 887VA Secure router with VDSL2/ADSL2+ over POTS
<b>CISCO887VA-M-K9</b>	Cisco 887VA Annex M router
<b>C887VA-CUBE-K9</b>	Cisco 887VA router with VDSL2/ADSL2+ over ISDN and integrated CUBE licenses
<b>Multi-mode DSL (VDSL2 and ADSI2/2+) with WLAN</b>	
<b>C886VA-W-E-K9</b>	Cisco 886VA router with VDSL2/ADSL2+ over ISDN with 802.11n ETSI Compliant
<b>C887VA-W-A-K9</b>	Cisco 887VA router with VDSL2/ADSL2+ over POTS with 802.11n FCC Compliant
<b>C887VA-W-E-K9</b>	Cisco 887VA router with VDSL2/ADSL2+ over POTS with 802.11n ETSI Compliant
<b>C887VAM-W-E-K9</b>	Cisco 887VA Annex M router with 802.11n ETSI Compliant
<b>Multi-mode DSL (VDSL2 and ADSI2/2+) with Embedded 3G</b>	
<b>C886VAG+7-K9</b>	Secure Router with VDSL2/ADSL2+ over ISDN and Embedded 3.7G HSPA+ Release 7 with SMS/GPS
<b>C887VAG-S-K9</b>	Secure Router with VDSL2/ADSL2+ over POTS and Embedded 3G EVDO Rev A with SMS/GPS for Sprint Networks
<b>C887VAG+7-K9</b>	Secure Router with VDSL2/ADSL2+ over POTS and Embedded 3.7G HSPA+ Release 7 with GPS
<b>C887VAMG+7-K9</b>	Secure Router with Raiders VDSL2/ADSL2+ over POTS (Annex M) and Embedded 3.7G HSPA+ Release 7 with GPS
<b>ADSL2/2+</b>	
<b>CISCO886-K9</b>	Cisco 886 ADSL2/2+ Annex B Router
<b>CISCO886-SEC-K9</b>	Cisco 886 ADSL2/2+ Annex B Security Router with Advanced IP Services
<b>CISCO886W-GN-E-K9</b>	Cisco 886 ADSL2/2+ Annex B Router with 802.11n ETSI Compliant
<b>CISCO887-K9</b>	Cisco 887 ADSL2/2+ Annex A Router
<b>CISCO887-SEC-K9</b>	Cisco 887 ADSL2/2+ Annex A Security Router with Advanced IP Services
<b>CISCO887W-GN-A-K9</b>	Cisco 887 ADSL2/2+ Annex A Router with 802.11n FCC Compliant
<b>CISCO887W-GN-E-K9</b>	Cisco 887 ADSL2/2+ Annex A Router with 802.11n ETSI Compliant
<b>CISCO887M-K9</b>	Cisco 887 ADSL2/2+ Annex M Router
<b>CISCO887MW-GN-E-K9</b>	Cisco 887 ADSL2/2+ Annex M Router with 802.11n ETSI Compliant
<b>ADSL2/2+ and 3G</b>	
<b>CISCO886G-K9</b>	Cisco 886 ADSL2/2+ Annex B Router with 3G
<b>CISCO886GW-GN-E-K9</b>	Cisco 886 ADSL2/2+ Annex B Router with 3G, 802.11n ETSI Compliant
<b>CISCO887G-K9</b>	Cisco 887 ADSL2/2+ Annex A Router with 3G
<b>CISCO887GW-GN-A-K9</b>	Cisco 887 ADSL2/2+ Annex A Router with 3G, 802.11n FCC Compliant
<b>CISCO887GW-GN-E-K9</b>	Cisco 887 ADSL2/2+ Annex A Router with 3G, 802.11n ETSI Compliant
<b>VDSL2</b>	
<b>CISCO887V-K9</b>	Cisco 887 VDSL2 over POTS Router
<b>CISCO887V-SEC-K9</b>	Cisco 887 VDSL2 over POTS Security Router with Advanced IP Services
<b>CISCO887VW-GNA-K9</b>	Cisco 887V VDSL2 Router with 802.11n FCC Compliant
<b>CISCO887VW-GNE-K9</b>	Cisco 887V VDSL2 Router with 802.11n ETSI Compliant
<b>VDSL2 and 3G</b>	
<b>CISCO887VG-K9</b>	Cisco 887V VDSL2 Router with 3G
<b>CISCO887VGW-GNA-K9</b>	Cisco 887V VDSL2 Router with 3G, 802.11n FCC Compliant
<b>CISCO887VGW-GNE-K9</b>	Cisco 887V VDSL2 Router with 3G, 802.11n ETSI Compliant
<b>G.SHDSL (ATM)</b>	
<b>CISCO888-K9</b>	Cisco 888 G.SHDSL Router
<b>C888-CUBE-K9</b>	Cisco 888 G.SHDSL Router with integrated CUBE licenses
<b>CISCO888-SEC-K9</b>	Cisco888 G.SHDSL Security Router with Adv IP Services
<b>CISCO888W-GN-A-K9</b>	Cisco 888 G.SHDSL Router with 802.11n FCC Compliant

Part Number	Product Name
<b>CISCO888W-GN-E-K9</b>	Cisco 888 G.SHDSL Router with 802.11n ETSI Compliant
<b>G.SHDSL (EFM)</b>	
<b>CISCO888E-K9</b>	Cisco 888E G.SHDSL Router with 802.3ah EFM Support
<b>CISCO888EW-GN-A-K9</b>	Cisco 888E G.SHDSL Router with 802.11n FCC Compliant and 802.3ah EFM Support
<b>CISCO888EW-GN-E-K9</b>	Cisco 888E G.SHDSL Router with 802.11n ETSI Compliant and 802.3ah EFM Support
<b>C888E-CUBE-K9</b>	Cisco 888E G.SHDSL Router with 802.3ah EFM Support and integrated CUBE licenses
<b>G.SHDSL (ATM) and 3G</b>	
<b>CISCO888G-K9</b>	Cisco 888 G.SHDSL Router with 3G
<b>CISCO888GW-G-NA-K9</b>	Cisco 888 G.SHDSL Router with 3G, 802.11n FCC Compliant
<b>CISCO888GW-G-NE-K9</b>	Cisco 888 G.SHDSL Router with 3G, 802.11n ETSI Compliant
<b>G.SHDSL (EFM) and 3G</b>	
<b>C888EG+7-K9</b>	Secure Router with Ethernet over G.SHDSL (EFM) and Embedded 3.7G HSPA+ Release 7 with SMS/GPS
<b>SRST</b>	
<b>C881SRST-K9</b>	Cisco 881 SRST Ethernet Security Router with FXS, FXO
<b>C881SRSTW-GN-A-K9</b>	Cisco 881 SRST Ethernet Security Router with FXS, FXO; 802.11n FCC Compliant
<b>C881SRSTW-GN-E-K9</b>	Cisco 881 SRST Ethernet Security Router with FXS, FXO; 802.11n ETSI Compliant
<b>C888SRST-K9</b>	Cisco 888 SRST G.SHDSL Router with FXS, BRI
<b>C888SRSTW-GN-A-K9</b>	Cisco 888 SRST G.SHDSL Router with FXS, BRI; 802.11n FCC Compliant
<b>C888SRSTW-GN-E-K9</b>	Cisco 888 SRST G.SHDSL Router with FXS, BRI; 802.11n ETSI Compliant
<b>Teleworker</b>	
<b>C881W-GN-A-K9</b>	Cisco 881 Ethernet Security Router with 802.11n FCC Compliant
<b>C881W-GN-E-K9</b>	Cisco 881 Ethernet Security Router with 802.11n ETSI Compliant
<b>C881W-GN-P-K9</b>	Cisco 881 Ethernet Security Router with 802.11n Japan Compliant
<b>POE</b>	
<b>800-IL-PM=2</b>	2 port 802.3af capable inline power module for 880 routers
<b>DRAM</b>	
<b>MEM8XX-256U512D</b>	256-MB DRAM upgrade to 512 MB for Cisco 880 Series Routers
<b>MEM8XX-256U768D</b>	512-MB DRAM upgrade to 768 MB for Cisco 880 Series Routers
<b>MEM8XX-512U768D</b>	512-MB DRAM upgrade to 768 MB for Cisco 880 Series Routers
<b>3G Modem</b>	
<b>PCEX-3G-CDMA-V</b>	Cisco 3G EVDO Rev A/0/1xRTT Modem-Verizon Networks
<b>PCEX-3G-CDMA-S</b>	Cisco 3G EVDO Rev A/0/1xRTT Modem-Sprint Networks
<b>PCEX-3G-CDMA-B</b>	Cisco 3G EVDO Rev A/0/1xRTT Modem-BSNL Networks
<b>PCEX-3G-HSPA-US</b>	Cisco 3.5G HSPA/UMTS/EDGE/GPRS Modem-AT&T Network Only
<b>PCEX-3G-HSPA-G</b>	Cisco 3.5G HSPA/UMTS/EDGE/GPRS Modem-Global Networks (Global SKU,excluding USA)
<b>Cisco IOS Universal Software for Cisco 880</b>	
<b>S880DUDK9*</b>	Cisco 880 Series IOS UNIVERSAL DATA
<b>S880VUDK9*</b>	Cisco 880 Series IOS UNIVERSAL VOICE
<b>Software License for Cisco 880 Data</b>	
<b>SL-880-ADSEC (default)</b>	Cisco 880 Advanced Security Image Feature License
<b>SL-880-AIS (upgrade option)</b>	Cisco 880 Advanced IP Services Image Feature License
<b>SL-880-ADVSEC-NPE</b>	Cisco 880 Advanced Security NPE License PAK (Paper)
<b>SL-880-AIS-NPE (upgrade option)</b>	Cisco 880 Advanced IP Services NPE License PAK (Paper)

Part Number	Product Name
<b>Software License for Cisco 880 Data (Bulk)</b>	
<b>L-SL-800-SEC-K9</b>	Advanced IP e-Delivery PAK for Cisco 800 Series
<b>Software License for Cisco 880 SRST and CUBE</b>	
<b>SL-SRST880-AIS (included by default)</b>	Cisco 880 Advanced IP Services Image Feature License
<b>SL-880-AIS and SL-880-ADVSEC (included by default)</b>	Cisco 880 Advanced IP Services and Security Image Feature License for 3G, Embedded 3G and CUBE models
<b>Security Services</b>	
<b>SL-CNFI-88x-1Y</b>	One year subscription to Content Filtering for Cisco 881/888-URL/Phishing
<b>SL-CNFI-8xx-TRI</b>	30 day free trial license for 88x series
<b>SSL</b>	
<b>FL-WEBVPN-10-K9</b>	Feature License SSL VPN for Up to 10 Users (incremental), for 12.4T based IOS releases only
<b>FL-SSLVPN10-K9</b>	Feature License SSL VPN for Up to 10 Users (incremental), for 15.x based IOS releases only
<b>Router Software</b>	
<b>C880data-universalk9-mz</b>	Universal image for Cisco 880 ISR Data Router Series
<b>C880voice-universalk9-mz</b>	Universal image for Cisco 880 SRST and CUBE Router Series
<b>Access Point Software</b>	
<b>ap801-k9w7-tar</b>	Autonomous software image for ap801
<b>ap801-rcvk9w8-tar</b>	LWAPP recovery image for ap801

\* Each software part number has the Cisco IOS Software release number at the end of the string. For example, the part number of IOS 12.4(20)T data universal image for Cisco 880 series is S880DUK9-12420T.

Cisco License Manager is a secure client- and server-based application used to manage Cisco IOS Software activation and licenses. For more information about Cisco License Manager, visit <http://www.cisco.com/go/clm>.

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