

## **CISCO 836 ADSL OVER ISDN SECURE BROADBAND ROUTERS ADVANCED SECURITY FOR DATA, VOICE, AND VIDEO ACCESS IDEAL FOR SMALL OFFICES AND TELEWORKERS**

The Cisco® 836 router is ideal for providing secure Internet and corporate network connectivity to small remote offices and to teleworkers (Figure 1). The Cisco 836 router provides integrated security services and advanced quality of service (QoS) features for high-quality data, voice, and video applications. It offers easy deployment and remote management features with Cisco IOS® Software.

The Cisco 836 router is ideal for providing secure Internet and corporate network connectivity to small remote offices and to teleworkers (Figure 1). The Cisco 836 router provides integrated security services and advanced quality of service (QoS) features for high-quality data, voice, and video applications. It offers easy deployment and remote management features with Cisco IOS Software.

The Cisco 836 router has an integrated asymmetric digital subscriber line (ADSL) modem that supports ADSL over Integrated Services Digital Network (ISDN). It has an integrated ISDN Basic Rate Interface (BRI) S/T port for a backup ISDN line, and a four-port 10/100 Ethernet LAN switch for connecting multiple PCs or network devices in a small-office network.

### **ADVANCED SECURITY AND PERFORMANCE FOR ENTERPRISE-CLASS VPNS**

The Cisco 836 router delivers integrated enterprise-class security services, including hardware-accelerated IP Security (IPSec), Triple Data Encryption Standard (3DES) encryption for virtual private networks (VPNs), and stateful-inspection firewall for secure Internet connectivity. Optional advanced features—such as Cisco Easy VPN Remote (a software feature that allows simple deployment and management of VPNs); public key infrastructure (PKI) security requiring digital certificates; IPSec Network Address Translation transparency (NAT-T); the Cisco Intrusion Detection System (IDS)\*; AES encryption\*, and URL filtering\*—help ensure that the small office receives the highest level of security, which contributes to the corporate network's security.

### **HIGH-QUALITY, SECURE VOICE AND VIDEO**

The advanced QoS and high-performance encryption features of the Cisco 836 router provide high-quality voice and video services to remote users. When IP phones are connected at a remote site, a Cisco 836 router can queue and prioritize the voice traffic over data traffic to ensure a high quality, secure voice-over-IP (VoIP) connection from the remote or home office back to the corporate network. Unique Cisco IOS software capabilities such as Preclassification of Traffic prior to Encryption\* and Look-ahead Fragmentation before Encryption\* ensure that traffic is correctly prioritized over a secure IPSec tunnel.

**Figure 1.** The Cisco 836 ADSL over ISDN Router



## MANAGEABLE, SCALABLE, AND RELIABLE ACCESS

The Cisco 836 router uses valuable management and deployment tools to deliver the industry's lowest total cost of ownership for connecting small remote offices and teleworkers to the corporate network. As a remotely manageable platform, the Cisco 836 router supports advanced remote troubleshooting commands available in Cisco IOS Software; out-of-band management through an ISDN port; and Secure Shell (SSH) Protocol for secure in-band management via Telnet.

For scalability in deployment and management, the Cisco Router Web SetUp Tool (CRWS), available in several languages, allows nontechnical users to quickly set up the router and turn on key features such as the stateful firewall. Cisco provides a suite of solutions—such as Cisco Easy VPN, the Cisco IE 2100 Intelligence Engine, Cisco VPN Solution Center (VPNSC), CiscoWorks Management Center for VPN Routers (Router MC), and Cisco Configuration Express—that allow for scalable network deployment and management, including automated security policy push and configuration updates.

For reliable access, the ISDN port provides ISDN dial backup and out-of-band management. The Cisco 836 router runs Cisco IOS Software, the industry-proven software that has become the standard for reliable business access.

## FEATURES AND BENEFITS

**Table 1.** Key Product Features and Benefits

Features	Benefits
<b>Advanced Security and Performance for Enterprise-Class VPNs</b>	
Stateful-inspection firewall	<ul style="list-style-type: none"><li>• Offers internal users secure, per-application dynamic access control (stateful inspection) for all traffic across perimeters</li><li>• Defends and protects router resources against denial-of-service (DoS) attacks</li><li>• Provides context-based access control (CBAC)</li><li>• Checks packet headers and drops suspicious packets</li><li>• Protects against unidentified, malicious Java applets</li><li>• Details transactions for reporting on a per-application, per-feature basis</li></ul>
Network security features with Cisco IOS Software, including access control lists (ACLs), Network Address Translation/Port Address Translation (NAT/PAT), Lock & Key security, dynamic ACLs, and router and route authentication	Provides perimeter network security to prevent unauthorized network access
Cisco Intrusion Detection System (IDS)*	Detects and prevents DoS attacks and unauthorized network access; sends alerts to initiate appropriate action
Hardware-accelerated IPSec 3DES encryption	<ul style="list-style-type: none"><li>• Delivers high-performance IPSec VPN encryption for broadband connections</li><li>• Supports Internet Key Exchange (IKE) and IPSec VPN standards for up to 10 simultaneous tunnels</li><li>• Provides WAN encryption for all users on the LAN without requiring the configuration of individual PCs</li></ul>
AES encryption*	AES support provides impenetrable security to the IPSec sessions
Cisco Easy VPN Remote	Provides easy deployment and maintenance of VPN connections with auto-IPSec tunnel initiation and policy push from a Cisco VPN concentrator or server

Features	Benefits
URL filtering with WebSENSE and N2H2 software and server*	<ul style="list-style-type: none"> <li>• Allows a network administrator to easily apply Internet use policies to permit access only to company-approved URLs or categories of sites</li> <li>• WebSENSE and N2H2 URL filtering software filters HTTP requests based on destination host name, destination IP address, keywords, and username</li> <li>• WebSENSE and N2H2 maintains and updates a URL database of more than 20 million sites, organized into more than 60 categories</li> </ul>
IPSec NAT Transparency (NAT Traversal or NAT Aware IPSec)*	Allows reliable creation of VPN tunnels independent of the placement of firewalls and NAT across multiple networks
PKI support with digital certificates	<ul style="list-style-type: none"> <li>• Standards-based robust key management allows better network scaling and enhanced key security</li> <li>• Facilitates extranet communications</li> </ul>
<b>High-Quality, Secure Voice and Video</b>	
IP QoS—Low Latency Queuing (LLQ), Weighted Random Early Detection (WRED), Committed Access Rate (CAR)	<ul style="list-style-type: none"> <li>• Ensures consistent response times for multiple applications by intelligently allocating bandwidth</li> <li>• Allows for classification of applications and gives the most important applications priority use of the WAN line</li> <li>• Provides congestion avoidance by throttling down certain Transmission Control Protocol (TCP) sessions, depending on each session's priority level</li> </ul>
Asynchronous Transfer Mode (ATM) QoS—ATM traffic universal broadband router (UBR), nonreal-time variable bit rate (VBRnrt), VBRrt, and constant bit rate (CBR) with per-VC queuing and traffic shaping	Provides QoS guarantees for real-time traffic, with ability to send traffic over the appropriate virtual circuit to provide ATM-level shaping and ensure that no head-of-line blocking can occur between circuits of different or equal traffic classes
High-performance encryption	Provides secure connectivity without affecting performance for bandwidth-intensive applications
IP multicast technology	Reduces redundant traffic; conserves bandwidth for corporate communications, distance-learning applications such as Cisco IP/TV®, software distribution, and access to stock quotes and news applications
<b>Advanced Management Features for Low Cost of Ownership</b>	
Plug-and-play installation with default settings and Web-based setup tool	Nontechnical users can easily set up the router and customize advanced features
Cisco Router Web SetUp Tool	Allows nontechnical users to complete installation by simply pointing a browser at the router and providing user information
Cisco Easy VPN Remote	Provides easy deployment and maintenance of VPN connections with auto-IPSec tunnel initiation and pushed policy acceptance
Cisco Configuration Express	Lowers the cost of deployment by shipping preconfigured units directly to end users without requiring staging or storage
Router status page in CRWS	Provides a Web-based visual presentation of router configuration and feature status
Cisco IOS Software interactive debug and remote management features	Enables remote management and monitoring via Simple Network Management Protocol (SNMP), Telnet, or HTTP and local management via console port to diagnose network problems in detail
<b>Cisco IOS Software command-line interface (CLI)</b>	Allows customers to use existing knowledge of Cisco IOS Software CLI for easier installation and manageability without requiring additional training

Features	Benefits
Cisco IOS Software technology	Offers technology that is used throughout the backbone of the Internet and in most enterprise networks
Cisco IE 2100 Intelligence Engine management appliance	Allows remote sites to be configured to automatically contact this centrally located device for Cisco IOS Software configuration updates
Supported by Cisco VPNSC, CiscoWorks VPN/Security Management Solution (VMS), and Cisco Secure Policy Manager	Allows for scalable deployment of security policy management
SSH	Provides a secure, encrypted connection to a router that is similar to an inbound Telnet session

\* Features targeted for a future Cisco IOS Software release

## PRODUCT SPECIFICATIONS

**Table 2.** Cisco 836 Series Hardware Specifications

Hardware Specifications	Cisco 836 Router
Processor	Motorola RISC
Default DRAM* Memory	64 MB
Maximum DRAM Memory	80 MB
Default Flash* Memory	12 MB
Maximum Flash Memory	24 MB
WAN	ADSL over ISDN
LAN	Four-port 10/100BASE-T with autosensing MDI/MDX for autocrossover
Console Port	RJ-45
ISDN Basic Rate Interface (BRI) S/T	RJ-45—ISDN BRI S/T port which can be configured for ISDN backup or out-of-band management
LEDs	10
External Power Supply	Universal 100–240 VAC

\* DRAM and Flash memory must be obtained from Cisco.

**Table 3.** Memory Requirements and Software Feature Sets for the Cisco 836 Router

Cisco 836 Series with Cisco IOS Software Images	Cisco 836 Series Memory Requirements	
	Flash	DRAM
IP/Firewall/IPSec 3DES (Default)	8 MB	32 MB
IP/Firewall/IPSec 3DES PLUS	8 MB	32 MB
IP/Firewall/IPSec 3DES/PLUS/Dial Backup	8 MB	32 MB

**Table 4.** Cisco 830 Series Software Feature Sets

Protocols and Features Supported by the Cisco 836 Router	IP/FW/IPSec 3DES (default feature set)	IP/FW/IPSec 3DES PLUS	IP/FW/IPSec 3DES PLUS Dial Backup
<b>Routing and Bridging</b>			
Transparent Bridging	X	X	X
IP Routing, IRB	X	X	X
Point-to-Point Protocol over Ethernet (PPPoE), including TCP MSS adjust	X	X	X
PPP over ATM (PPPoA)	X	X	X
IP-enhanced Interior Gateway Routing Protocol (IGRP)	—	X	X
Routing Information Protocol (RIP), RIPv2	X	X	X
<b>Security</b>			
Route and router authentication	—	X	X
Multilevel user authentication for access to router for management	X	X	X
Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), and Local Password	X	X	X
Generic routing encapsulation (GRE) tunneling	—	X	X
IP basic and extended access lists, Lock & Key	X	X	X
Stateful-inspection firewall	X	X	X
IPSec 56-bit encryption	X	X	X
IPSec 3DES encryption	X	X	X
Hardware-accelerated IPSec 3DES encryption	—	X	X
PKI with digital certificates	—	X	X
Cisco Easy VPN Remote	—	X	X
Multiuser IPSec pass-through (TCP and unencapsulated)	X	X	X
Multiuser Point-to-Point Tunneling Protocol (PPTP) pass-through	X	X	X
Advanced Encryption Standard (AES) (software-based)*	—	X	X
URL filtering with WebSENSE software and server*	—	X	X
IPSec NAT Transparency (NAT Traversal or NAT Aware IPSec)*	—	X	X
Remote Authentication Dial-In User Service (RADIUS)	—	X	X
Terminal Access Controller Access Control System Plus (TACACS+)	—	X	X

Protocols and Features Supported by the Cisco 836 Router	IP/FW/IPSec 3DES (default feature set)	IP/FW/IPSec 3DES PLUS	IP/FW/IPSec 3DES PLUS Dial Backup
<b>QoS</b>			
LLQ	X	X	X
IP policy routing	X	X	X
WRED	—	X	X
CAR	—	X	X
Link Fragmentation and Interleaving (LFI)	—	X	X
Per-VC queuing and per-VC traffic shaping	X	X	X
ATM UBR, CBR, VBR-nrt, and VBR-rt (Cisco 836 and 837 routers only)	X	X	X
ATM fault management, Operation, Administration and Maintenance (OAM) (F5) segment continuity check and segment and end-to-end loopback and Interim Local Management Interface (ILMI) support	X	X	X
Ten virtual circuits/permanent virtual circuits (PVCs)	X	X	X
TX ring adjustment (Cisco 836 and 837 only)	X	X	X
<b>Bandwidth Optimization and Management</b>			
IP multicast	—	X	X
Protocol Independent Multicast (PIM) sparse mode	—	X	X
Standards-based encryption (STAC) compression	X	X	X
<b>Ease of Use and Deployment</b>			
CRWS	X	X	X
Cisco Easy VPN Remote	—	X	X
<b>Management</b>			
SNMP, Telnet, and console port	X	X	X
Syslog	X	X	X
Trivial File Transfer Protocol (TFTP) client and server	X	X	X
Cisco Service Assurance Agent (SAA)	X	X	X
Out-of-band management through virtual AUX port	—	—	X
Out-of-band management through ISDN BRI S/T port	—	—	X
<b>Redundancy</b>			
Hot Standby Router Protocol (HSRP)	—	X	X
Dial backup with external modem through ISDN BRI S/T port	—	—	X

Protocols and Features Supported by the Cisco 836 Router	IP/FW/IPSec 3DES (default feature set)	IP/FW/IPSec 3DES PLUS	IP/FW/IPSec 3DES PLUS Dial Backup
<b>Address Conservation and Allocation</b>			
NAT many-to-one (PAT)	X	X	X
NAT many-to-many (multi-NAT)	X	X	X
H.323 support with NAT	X	X	X
NetMeeting V.2.10/1 and 3.01	X	X	X
Session Initiation Protocol (SIP) support with NAT*	X	X	X
IP Control Protocol (IPCP) address and subnet negotiation	X	X	X
Dynamic Host Control Protocol (DHCP) client and server	X	X	X
DHCP relay	X	X	X
DHCP client address negotiation	X	X	X

\*Features targeted for a future Cisco IOS Software release

**Table 5.** Cisco 800 Series DSLAM Interoperability

DSLAM	Chipset	Interoperability Status	Comments
Alcatel ASAM 1000	AME	Yes	—
Alcatel 7300	AME	Yes	—
Lucent Stinger	AME	Yes	—
ECI	ADI 918	Yes	UR-2 compliant
ECI	ADI 930	Yes	UR-2 compliant
Siemens XpressLink 2.0	TI	Yes	UR-2 compliant
Siemens XpressLink 2.1	TI	Yes	UR-2 compliant

## Regulatory And Standards Compliance

The Cisco 836 router is available for worldwide deployment where ADSL over ISDN is used by service providers.

### Safety

- UL 1950/CSA 950-95: Third Edition
- IEC 950: Second Edition with Amendments 1, 2, 3, and 4
- EN60950: 1992 with Amendments 1, 2, 3, and 4
- CS-03, Canadian Telecom Requirements
- FCC Part 68 U.S. Telecom Requirements
- AS/NZS 3260: 1996 with Amendments 1, 2, 3, and 4
- ETSI 300-047
- TS 001 with Amendment 1
- EMI
- AS/NRZ 3548: 1992 Class B
- CFR 47 Part 15 Class B
- EN60555-2 Class B
- EN55022 Class B
- VCCI Class II
- ICES-003, Issue 2, Class B, April 1997S
- IEC 1000-3-2

## Immunity

- IEC 1000-4-2 (EN61000-4-2)
- IEC 1000-4-3 (ENV50140)
- IEC 1000-4-4 (EN61000-4-4)

## Cisco 836 Router ADSL Specifications

ST-Micro DynaMiTe (formerly Alcatel Micro Electronics) ADSL Chipset (20150)

- ETSI 101-388 v1.2.1 ADSL over ISDN
- Annex B ITU ADSL over ISDN support (Planned)
- UR-2 Specification (Deutsche Telekom)

The chipset does not provide interoperability with carrierless amplitude modulation/phase modulation (CAP)-based ADSL lines.

## ISDN Specifications

- Two B channels plus one D channel: 2 x 64 Kbps (precompressed)
- Interoperable switched 56: 2 x 56 Kbps (precompressed)
- Single-point and multipoint configurations
- Compatible with data or voice B-channel ISDN switch types
- CTR3 (ETSI, NET3)
- VN3/4/5 (France)

## Physical Specifications

- Dimensions (H x W x D): 2.0 x 9.7 x 8.5 in. (5.1 x 24.6 x 21.6 cm)
- Weight: 1.48/1.5 lb (0.67/0.68 kg)

## Environmental Operating Ranges

- Nonoperating temperature: -4 to 149°F (-20 to 65°C)
- Nonoperating humidity: 5 to 95%, relative humidity (noncondensing)
- Nonoperating altitude: 0 to 15,000 ft (0 to 4570 m)
- Operating temperature: 32 to 104°F (0 to 40°C)
- Operating humidity: 10 to 85%, relative humidity (noncondensing)
- Operating altitude: 0 to 10,000 ft (0 to 3000 m)

## Power Ratings

- AC input voltage: 100 to 250 VAC, 50 to 60 Hz
- Power consumption: 6 to 10W (idle-maximum consumption)
- Power supply rating: 15



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