Cisco 831 Router and SOHO 91 Router Hardware Installation Guide

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The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system.

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Preface

This preface describes the audience, organization, and conventions used in this guide. It also describes related documentation and how to access electronic documentation.

Audience

This guide is intended for service technicians who have no experience installing routers and whose goal is to connect the router to the network as quickly as possible.

Organization

This guide contains the following information:

- Chapter 1, "Product Overview"—Describes the routers and their features.
- Chapter 2, "Installation"—Provides information on preinstallation procedures, mounting and connecting of the routers, and verifying the router connections.
- Chapter 3, "Troubleshooting"—Describes problems that might develop and how to identify and solve them.
- Appendix A, "Specifications and Cables"—Provides port connector pinouts and specifications for cables that you might need to provide.

Conventions

This section describes the conventions used in this guide.

Note Means *reader take note*. Notes contain helpful suggestions or references to additional information and material.

Caution This symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Warning **This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with the standard practices for preventing accidents.**

Waarschuwing **Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.**

Varoitus **Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.**

Attention **Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.**

Warnung **Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.**

Avvertenza **Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.**

Advarsel **Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.**

Aviso **Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.**

¡Atención! **Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.**

Varning! **Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.**

Related Documentation

In addition to this *Cisco 831 Router and SOHO 91 Router Hardware Installation Guide*, the Cisco 831 documentation set includes the following:

- *Cisco 831 Router and SOHO 91 Router Cabling and Setup Quick Start Guide*
- *Cisco 800 Series Software Configuration Guide*
- *Regulatory Compliance and Safety Information for Cisco 800 Series and SOHO Series Routers*
- The latest version of the *Cisco IOS Release Notes*

You might also need to refer to the following documents:

- *Cisco IOS Release 12.0 Quality of Service Solutions Configuration Guide*
- *Cisco IOS Security Configuration Guide, Release 12.0*
- *Upgrading Memory in Cisco 800 Routers*

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation DVD

Cisco documentation and additional literature are available in a Documentation DVD package, which may have shipped with your product. The Documentation DVD is updated regularly and may be more current than printed documentation. The Documentation DVD package is available as a single unit.

Registered Cisco.com users (Cisco direct customers) can order a Cisco Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/

Cisco Marketplace:

http://www.cisco.com/go/marketplace/

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can send comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

- Nonemergencies — psirt@cisco.com

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.*x* through 8.*x*.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list:

http://pgp.mit.edu:11371/pks/lookup?search=psirt%40cisco.com&op=index&exact=on

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Product Overview

The Cisco 831 router and Cisco SOHO 91 Ethernet-to-Ethernet routers can connect a corporate telecommuter or small office to an Internet service provider (ISP) over a broadband or Ethernet connection to the following sites:

- Corporate LANs
- The Internet

The Cisco 831 and SOHO 91 routers are switch-capable routers that provide a 4-port Ethernet switch for the LAN. The routers are capable of bridging and multiprotocol routing between LAN and WAN ports.

Cisco 831 and SOHO 91 routers support high-speed encryption, 10/100-Mbps switching, and dial backup functionality via the auxiliary console port. The autosensing function in the routers eliminates the need for a crossover cable and allows the routers to detect the medium dependent interface in normal mode (MDI) or medium dependent interface in crossover mode (MDIX) in any other PC/hub with a straight-through cable or crossover cable.

The dial backup function allows the user to connect an analog modem to the console port as a backup link to the WAN in case the ADSL service goes down. These features give the Cisco 831 and SOHO 91 routers a high level of performance and security.

The Cisco 831 router is designed with hardware-based encryption, while the Cisco SOHO 91 supports software-based encryption. The Cisco 831 router supports the ability to add Flash memory or SDRAM, either as a factory upgrade or a field-installed option. The SOHO 91 router has a fixed memory configuration.

Features

Table 1-1 summarizes the features of these routers.

Table 1-1 Feature Summary for Cisco 831 Router and SOHO 91 Router

Feature	Description
10BASE-T/100BASE-T built-in switch ports	Provides connection to 10/100BASE-T (10/100-Mbps) Ethernet networks. Compatible with 10/100-Mbps devices.
WAN port	Provides connection to 10BASE-T. Compatible with 10-Mbps devices. Can be connected to other network devices, such as cable modem, ADSL, and router.
Flash memory	8 MB of Flash memory; up to 16 MB of expandable Flash memory on the Flash module.
Synchronous dynamic RAM (SDRAM)	32 MB of SDRAM on board.
Ease of installation	Color-coded ports and cables reduce the chance of installation error.
Cisco IOS software	Supports Cisco IOS software.
Cisco Router Web Setup application	Provides a web-based software tool for basic configurations and selected applications.
Console port	Provides a connection to the terminal or PC for software configuration or troubleshooting using the command-line interface.
Wall-mount feature	Brackets on router bottom provide a means for mounting the router on a wall or vertical surface.
IPSec Hardware Accelerator	Only the Cisco 831 router supports this feature. The Hifn 7902 security processor implements symmetric key encryption, public key encryption, authentication and data compression in hardware. Algorithms implemented by the processor include Data Encryption Standard (DES) and Triple DES (3DES); Secure Hash Algorithm (SHA-1), Message Digest 5 (MD5), Hash-based Message Authentication Code (HMAC); and Lempel-Zif-Stac (LZS) compression; and Microsoft Point-to-Point Compression (MPPC).

Table 1-2 describes the ports on the Cisco 831 and SOHO 91 routers.

Table 1-2 Cisco 831 and SOHO 91 Router Ports

Router	Built-In Switch	WAN Ethernet Port	Console Port
Cisco 831	Four 10/100 BASE-T RJ-45	One 10BASE-T RJ-45	RJ-45
SOHO 91	Four 10/100 BASE-T RJ-45	One 10BASE-T RJ-45	RJ-45

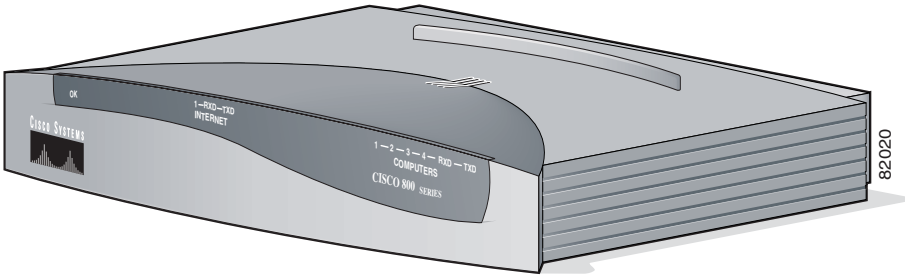
Router Overview

This section shows the front and back panels of the routers.

Front Panel

Figure 1-1 shows the front panel of the Cisco 831 router (Figure 1-1 depicts the front panel of a Cisco 831 router, but the front panel of the Cisco SOHO 91 router is the same).

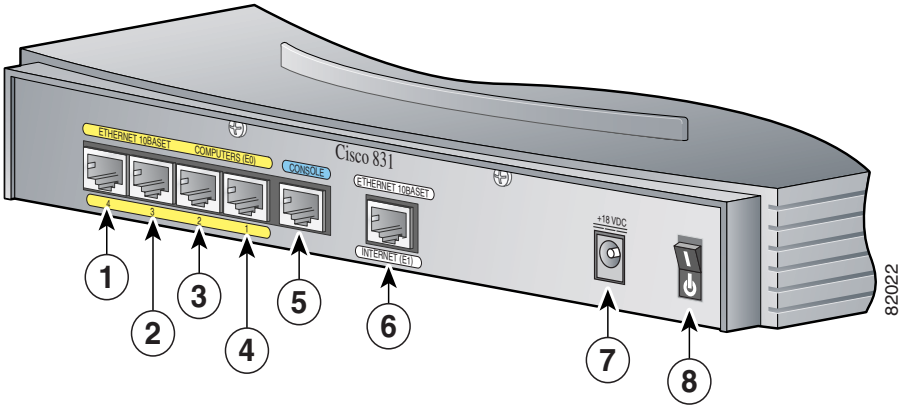
Figure 1-1 Front Panel of Cisco 831 Router



Back Panel

Figure 1-2 shows the back panel of the Cisco 831 router (Figure 1-2 depicts the back panel of a Cisco 831 router, but the back panel of the Cisco SOHO 91 router is nearly identical).

Figure 1-2 Cisco 831 Back Panel



1	Ethernet port 4 of the built-in switch connects to Ethernet network devices	**5**	Console port connects to PC or terminal
2	Ethernet port 3 of the built-in switch connects to Ethernet network devices	**6**	WAN port connects to Internet or switch
3	Ethernet port 2 of the built-in switch connects to Ethernet network devices	**7**	Input jack connects to power supply
4	Ethernet port 1 of the built-in switch connects to Ethernet network devices	**8**	Power on/off button

LED Functions

Table 1-3 summarizes the functions of the LEDs on the routers.

Table 1-3 Functions of LEDs on the Cisco 831 Router and SOHO 91 Router

LED	Color	Function
PWR_OK	Green	On when DC power is being supplied to the router. The light blinks if an error occurs during boot-up.
WAN_LED_OK	Green	On when WAN Ethernet carrier detects status and connects to the digital subscriber line access multiplexer (DSLAM) successfully.
WAN_LED_RxD	Green	Blinks when WAN Ethernet receives data.
WAN_LED_TxD	Green	Blinks when WAN Ethernet transmits data. Off when no data is being uploaded.
E1 (port 1 of built-in switch) Status	Green	On when Ethernet 1 connects to the Ethernet interface successfully. Blinks when Ethernet 1 receives or sends data, or when data passes through Ethernet 1.
E2 (port 1 of built-in switch) Status	Green	On when Ethernet 2 connects to the Ethernet interface successfully. Blinks when Ethernet 2 receives or sends data, or when data passes through Ethernet 2.
E3 (port 1 of built-in switch) Status	Green	On when Ethernet 3 connects to the Ethernet interface successfully. Blinks when Ethernet 3 receives or sends data, or when data passes through Ethernet 3.
E4 (port 1 of built-in switch) Status	Green	On when Ethernet 4 connects to the Ethernet interface successfully. Blinks when Ethernet 4 receives or sends data, or when data passes through Ethernet 4.
LAN_RxD	Green	Blinks when built-in Ethernet switch receives data from the WAN port.
LAN_TxD	Green	Blinks when built-in Ethernet switch transmits data to the WAN port.