



CHAPTER 1

Overview

The Cisco 7201 router provides application-specific features for broadband subscriber aggregation and network application services with high processing performance.

This chapter provides a quick hardware and features overview and options installation instructions for the Cisco 7201 router. For functional information, see [Chapter 3, “Starting and Configuring the Router,”](#) the “[Functional Overview](#)” section on page 3-1. For system specifications and port and cabling specifications, see [Appendix A, “Specifications.”](#)

This chapter includes the following sections:

- [Cisco 7201 Features](#), page 1-2
- [Cisco 7201 Hardware Overview](#), page 1-3
- [Checking the Shipping Container Contents](#), page 1-11
- [Cisco 7201 Router Installation Checklist](#), page 1-11



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 standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071



Warning

Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for Cisco 7200 Series Routers* publication. This document provides important safety information you should know before working with the system. Statement 200

Cisco 7201 Features

The Cisco 7201 router consists of the following features:

- Small form-factor—One rack-unit (RU) high with stacking capability: 1.73 in. x 17.3 in. x 16.2 in. (4.39 cm x 43.94 cm x 41.20 cm) (H x W x D). The weight is approximately 16.5 lb (7.48 kg).
- Four native Gigabit Ethernet interfaces—Six physical access ports:
 - Four optical fiber Gigabit Ethernet (1000 Mbps) ports that use small form-factor pluggable (SFP) modules with LC connectors. Gigabit Ethernet ports 0, 1, and 2 support 10/100/1000 Mbps, and ports 2 and 3 support only 1000 Mbps.
 - Two Gigabit Ethernet (10/100/1000 Mbps) ports with RJ-45 connectors (The use of an RJ-45 port or SFP port on a common Gigabit Ethernet interface is mutually exclusive at any one time.)
- One 10/100-Mbps Fast Ethernet Management port—To be used only as a management port; not to be used as a Fast Ethernet interface port
- Both 25-MHz and 50-MHz port adapter operation
- A 256-MB CompactFlash Disk
- One USB port for data storage, supporting 64-, 128-, and 256-MB data storage modules, and supporting the 32-Kb Aladdin USB eToken Pro Key for VPN applications
- SFP modules: Four Gigabit Ethernet SX, LH/LX, ZX, and FX module options supported on all four Gigabit Ethernet ports, and one 1000BASE-T SFP (copper) module supported only on ports GE 0/2 and GE 0/3
- Dual AC power or dual DC power supplies
- Freescale 7448 processor that operates at an internal clock speed of 1.67 GHz
- Two levels of cache memory: primary and secondary cache that are internal to the microprocessor with secondary unified cache for data and instruction
- One system controller that provides the connectivity between the processor and surrounding subsystems, including PCI busses, the DDR-SDRAM DIMM, the native Gigabit Ethernet interfaces, and the local bus with the various slow speed control and interface logic
- 3-MB Boot ROM for storing the ROMmon images
- Internal flash memory for storing the boot helper (boot loader) image and the Cisco IOS image
- Two SDRAM memory options: 1 GB and 2 GB
- 2-MB NVRAM for storing the system configuration and environmental monitoring logs
- Auxiliary port with full data terminal equipment (DTE) functionality
- Console port with full data communications equipment (DCE) functionality
- Online insertion and removal (OIR)—Allows you to add, replace, or remove port adapters with minimal interruption of the system
- Software support: Cisco IOS Release 12.4(4)XD7, Cisco IOS Release 12.2(31)SB5, and Cisco IOS Release 12.4(15)T1
- Environmental monitoring and reporting functions—Allow you to maintain normal system operation by resolving adverse environmental conditions prior to loss of operation

- Downloadable software—Allows you to load new images into flash memory remotely, without having to physically access the router, for fast, reliable upgrades
- Front-to-back airflow—Allows you to mount the router from either front or back into 19-inch equipment racks and 23-inch equipment racks

Cisco 7201 Hardware Overview

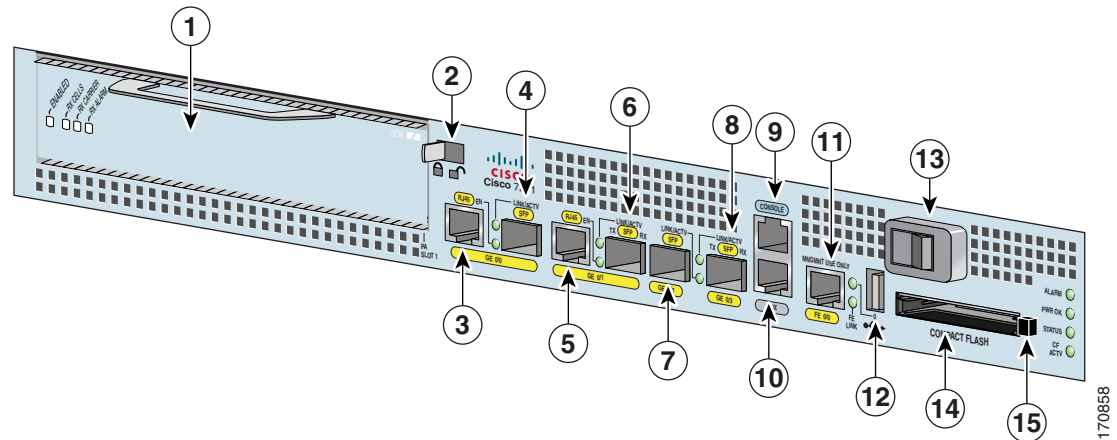
This section provides an overview of the hardware, including LEDs, front and rear views, and interior component identification.

- [Front View, page 1-3](#)
- [Rear View, page 1-7](#)
- [Interior View, page 1-9](#)

Front View

The faceplate of the Cisco 7201 router is described in this section.

Figure 1-1 Cisco 7201 Router—Front View

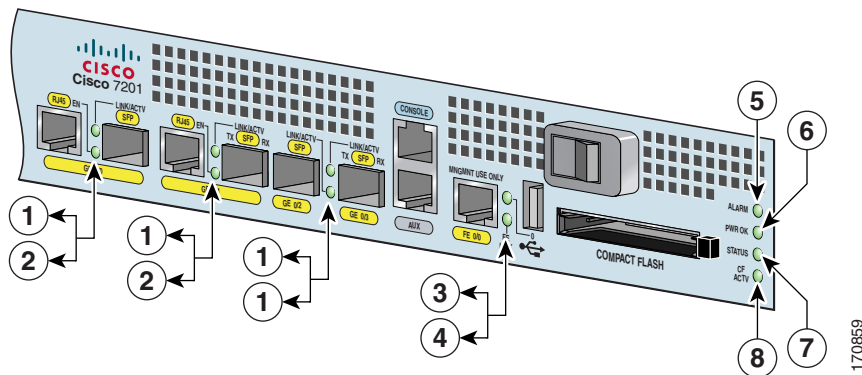


1	Port adapter slot (with installed port adapter)	9	Console port
2	Port adapter lever	10	Auxiliary port
3	Gigabit Ethernet 0/0—RJ-45 port	11	Fast Ethernet 0/0—Fast Ethernet Management port
4	Gigabit Ethernet 0/0—SFP port	12	USB port
5	Gigabit Ethernet 0/1—RJ-45 port	13	Power switch
6	Gigabit Ethernet 0/1—SFP port	14	CompactFlash Disk slot
7	Gigabit Ethernet 0/2—SFP port	15	CompactFlash Disk ejector button
8	Gigabit Ethernet 0/3—SFP port		

Faceplate LEDs

The Cisco 7201 router LEDs and behaviors are described in this section.

Figure 1-2 Cisco 7201 Router—Faceplate LEDs



No.	LED Label	LED	In the Power Up State	
			Color—Activity	Behavior Description
1	LINK/ACTV (Link/Active) (0/0, 0/1, 0/2, 0/3)	SFP and RJ-45 ports	Solid green	Link with no activity
			Flashing green	Link with activity
			Off	No link
2	EN (Enable) (0/0, 0/1)	RJ-45 ports only	Solid green	RJ-45 port is selected.
			Off	SFP port is selected.
3	USB	USB port	Flashing green	Activity
			Off	No activity
4	FE 0/0	Fast Ethernet Management port	Solid green	Link with no activity
			Flashing green	Link with activity
			Off	No link
5	ALARM	Alarm port	Solid red	On if Cisco IOS has crashed, and a reset has happened, and remains on until Cisco IOS is reloaded.
			Off	Off, the system is normal.
6	PWR OK	Power	Solid green	The power-on is successful and the system is attempting to boot software, or has booted software.
			Off	Off, the router is in standby mode.
7	STATUS	System status	Solid green	Cisco IOS has successfully booted.
			Blinking amber	ROMmon is loading.
			Blinking green	Cisco IOS is loading.
8	CF ACTV	CompactFlash Disk	Flashing green	Activity
			Off	No activity

SFP Module Information

You may have ordered a small form-factor pluggable (SFP) module with your Cisco 7201 router. You must install the SFP module. It is shipped separately to prevent damage during shipment. After reading this section, use the installation instructions in the “[Removing and Installing an SFP Module](#)” section on [page 4-2](#) to install the SFP modules.

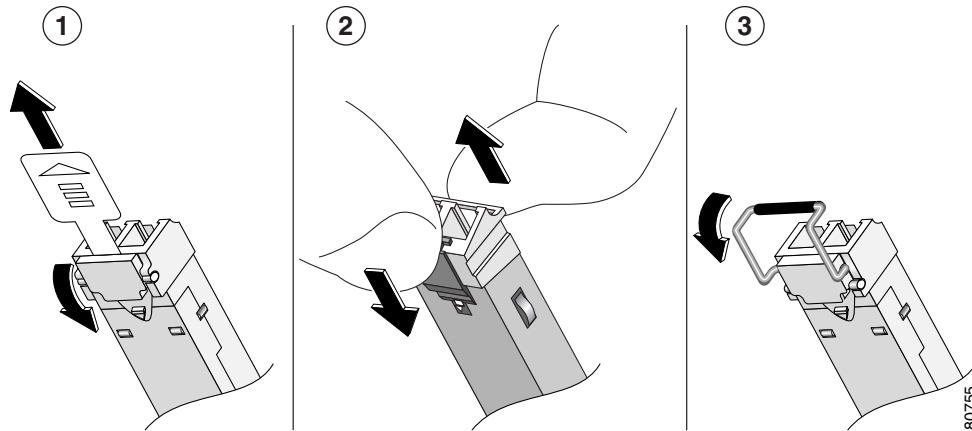
For ease of installation, insert the SFP module in the router while it is powered down and before placing it in a rack.

The SFP port is a 1000-Mbps optical interface in the form of an LC-type duplex port that supports IEEE 802.3z interfaces compliant with the 1000BASEX standard. Gigabit Ethernet SFP models SFP-GE-S, SFP-GE-L, SFP-GE-Z, and SFP-GE-F are supported in the Cisco 7201 router, as well as the SFP-GE-T. The cabling information is the same for all optical SFP modules.

Also see the “[SFP Module Specifications and Configurations](#)” section on [page A-4](#), and the *Gigabit Interface Converter (GBIC) Module and Small Form-Factor Pluggable (SFP) GBIC Module Installation Information and Specifications* document at http://www.cisco.com/en/US/docs/routers/7200/install_and_upgrade/gbic_sfp_modules_install/5067g.html

For optical connection cleaning information, see the *Inspection and Cleaning Procedures for Fiber-Optic Connections* document at http://www.cisco.com/en/US/tech/tk482/tk876/technologies_white_paper09186a0080254eba.shtml and the *Compressed Air Cleaning Issues for Fiber-Optic Connections* document at http://www.cisco.com/en/US/tech/tk482/tk611/technologies_white_paper09186a00801b08da.shtml

Figure 1-3 Types of SFP Module Latches



1	Sliding latch	3	Swing latch
2	Swing and slide latch		



Note

The SFP module must be installed before you connect the cables to it.

- The SFP module has three types of latches, which are also the removal mechanism. See [Figure 1-3](#). There is no correlation of the type of latch to the model (such as SX or LH/LX) or technology type (such as Gigabit Ethernet) of SFP modules. Always read the label on the SFP module to determine the technology type and model.
- You can install and remove Gigabit Ethernet SFP modules with power on to the system.

**Warning**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

**Warning**

Class 1 laser product. Statement 1008

**Warning**

Class 1 LED product. Statement 1027

- Disconnect all cables before removing or installing a Gigabit Ethernet SFP module. We strongly recommend that you do *not* install or remove the SFP module with optical fiber cables attached to it.
- SFP modules are keyed to prevent incorrect insertion.

USB Port Information

The Cisco 7201 provides a USB port that can be used with a USB Flash memory module as secondary storage, and can be used to store Cisco IOS images, data, and configuration files. The Cisco 7201 USB port can also be used with the Aladdin USB eToken Pro key. This USB device can be used for the following functions:

- The Cisco USB Flash memory module can be used to store an image or configuration file like a CompactFlash Disk. Unlike the Aladdin USB eToken Pro key, the Cisco USB Flash memory module is nonsecure. See [Table A-5 on page A-4](#) for available USB token configurations and product numbers.
- The USB eToken Pro key by Aladdin Knowledge Systems provides a secure means to store and deploy information, such as a bootstrap configuration or VPN credentials, separate from the router chassis. The Aladdin USB eToken Pro key uses smart card technology to protect a small area of memory and grants access using a personal identification number (PIN). When IP Security (IPSec) VPN credentials are stored on the Aladdin USB eToken Pro key, they are safely external to the router. When the USB eToken is inserted in a USB port, the router can pass the PIN and unlock it, retrieving the credentials and copying them into running memory. When the Aladdin USB eToken Pro key is removed, the router erases the credentials from running memory, ensuring that they cannot be retrieved from the router itself.

**Note**

For more information about the eToken Pro key by Aladdin Knowledge Systems, see the Aladdin website at www.aladdin.com/etoken/cisco.

**Note**

The Cisco USB Flash memory module cannot be used to boot the router. The USB drivers exist only in Cisco IOS software, not ROM Monitor mode (ROMmon). As a result, a Cisco IOS image must be booted to load the drivers; only then can files be copied to and from the USB Flash memory module.

CompactFlash Disk Information

The Cisco 7201 router has one CompactFlash Disk slot that uses CompactFlash Disks. The device in this slot is always addressed as **disk0:** when using Cisco IOS command-line interface (CLI) commands.

CompactFlash Disks are smaller in size than Type 2 Flash Disks but provide the same AT Attachment (ATA) interface and equivalent functionality. This interface complies with the ANSI ATA Interface Document X3T13.1153 D Rev. 9 specification. CompactFlash Disks provide from 256 MB of storage.

The CompactFlash Disk has controller circuitry that allows it to emulate a hard disk and automatically maps out bad blocks and performs automatic block erasure. The CompactFlash Disk also provides the capability to allocate noncontiguous sectors, which eliminates the need for the **squeeze** command (which was required with older-style linear flash memory cards to recover the space used by deleted files).

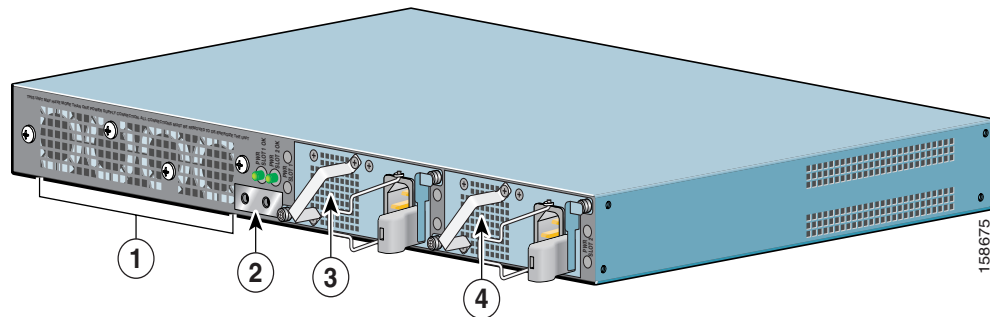
The CompactFlash Disk also supports the Cisco IOS File System feature, which provides a single interface to all of the router's file systems, including the Flash Disks and flash memory, as well as network file systems such as File Transfer Protocol (FTP) and Trivial FTP (TFTP) servers.

Table A-4 on page A-3 lists the CompactFlash Disk options. Also see Appendix B, "Using the CompactFlash Disk."

Rear View

This section provides information about the power supplies and fans on the rear of the Cisco 7201 router.

Figure 1-4 Cisco 7201—Rear View



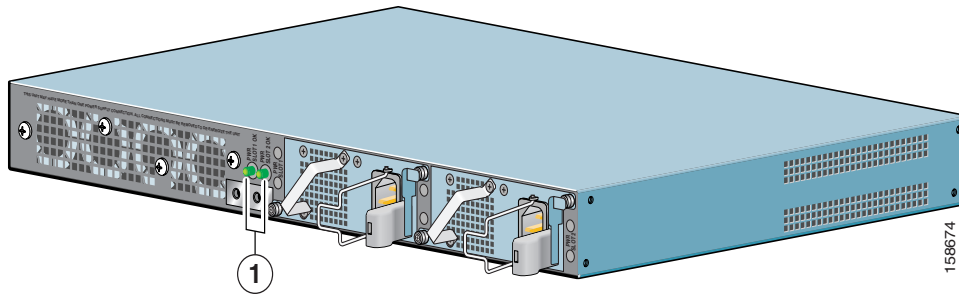
1	Fans	3	Power supply slot 1
2	Chassis ground connector	4	Power supply slot 2

Four internal fans draw cooling air into the chassis and across internal components to maintain an acceptable operating temperature. (See Figure 1-4.) The four fans are located at the rear of the chassis, as is the chassis grounding connector that provides a chassis ground connection for ESD equipment or a two-hole grounding lug. Two power supplies, either two AC power supplies or two DC power supplies, are accessed from the rear of the router.

Power Supply LEDs

The power supply LEDs are to the left of the power supplies on the rear of the chassis.

Figure 1-5 Power Supply LEDs

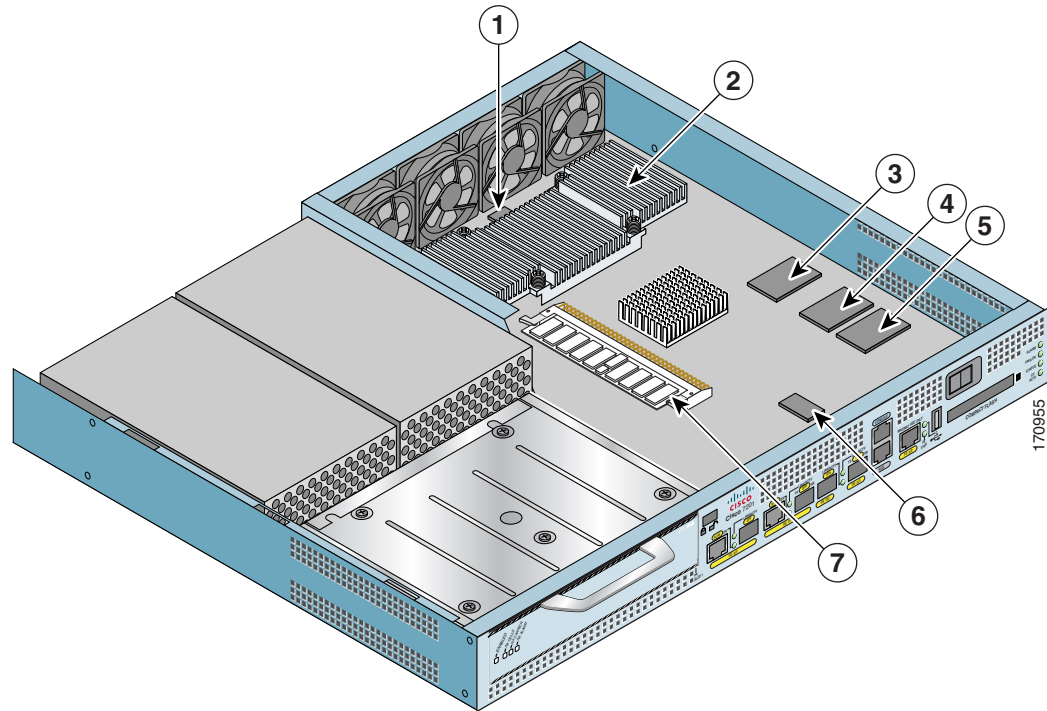


No.	LED Label	LED	In the Power Up State	
			Color—Activity	Behavior Description
1	PWR Slot 1	Power supply activity	Green	Active
			Off	Off; the router is in standby mode.
	PWR Slot 2	Power supply activity	Green	Active
			Off	Off; the router is in standby mode.

Interior View

This section describes the Cisco 7201 interior components and their locations.

Figure 1-6 Cisco 7201 Router—Interior View



1	Temperature sensor (outlet—U20)	5	Flash memory (U13)
2	Freescale 7448 processor	6	Temperature sensor (inlet—U12)
3	Boot ROM (U24)	7	DIMM (U16)
4	Flash memory (U19)		

On the underside of the board is NVRAM (U77) and flash memory (U67, U70).

System Board

Internally, the system board contains the following components:

- One DDR-SDRAM memory module (DIMM) for providing code, data, and packet storage
- The Freescale 7448 processor
- Marvel Discovery III—Hardware logic to interconnect the processor, double data rate synchronous dynamic random-access memory (DDR-SDRAM), dual PCI /PCI-X buses, three direct-interface Gigabit Ethernet interfaces, and a generic device bus

- Cache memory
The processor system has two levels of cache: primary and secondary cache that are internal to the microprocessor with secondary unified cache for data and instruction.
- Four Gigabit Ethernet interfaces (six ports: four SFP [optical] and two RJ-45s [copper]). Only four ports are available at the same time.
- One Fast Ethernet Management port
- A CompactFlash Disk for storing the default Cisco IOS software image
- Auxiliary port with full data terminal equipment (DTE) functionality
- Console port with full data communications equipment (DCE) functionality
- Boot ROM for storing sufficient code for booting the Cisco IOS software
- Flash memory for storing the boot helper (boot loader) image
- NVRAM for storing the system configuration and environmental monitoring logs. NVRAM uses lithium batteries to maintain its contents when disconnected from power.
- Two environmental sensors for monitoring the internal temperature of the chassis

System Management Functions

The Cisco 7201 processor system performs the following system management functions:

- Sending and receiving routing protocol updates
- Managing tables, caches, and buffers
- Monitoring interface and environmental status
- Providing Simple Network Management Protocol (SNMP) management through the console and Telnet interface
- Accounting for and switching of data traffic
- Booting and reloading images
- Managing the port adapter (including recognition and initialization during online insertion and removal)

The Cisco 7201 router supports multiprotocol, multimedia routing and bridging with a wide variety of protocols and port adapters.

Checking the Shipping Container Contents

Use the Cisco 7201 components list to check the contents of the Cisco 7201 router shipping container. Do not discard the shipping container. You need the container if you move or ship the Cisco 7201 router in the future.

Table 1-1 Cisco 7201 Components List

Component	Description	Received
Chassis	Cisco 7201 chassis configured with dual AC or dual DC power supplies and a port adapter blank panel if a port adapter has not been ordered.	
Accessories:	The following accessories might arrive in separate shipping containers or might ship installed:	
<ul style="list-style-type: none"> Rack-mount and cable-management kit 	Two rack-mount brackets, one cable-management bracket, four 6-32 x 0.25-in. screws to secure the rack-mount brackets to the chassis, four 10-32 or 12-24 screws to secure the rack-mount brackets to a 19-inch rack, or a 21–23-inch rack, and one M4 x 20-mm screw to attach the cable-management bracket to the rack-mount bracket	
<ul style="list-style-type: none"> Power cables 	An AC power cable, if an AC power supply was ordered	
<ul style="list-style-type: none"> Documentation 	Router hardware and software documentation and the Cisco Documentation DVD package	
	An optional Cisco USB Flash memory module, if ordered	
Optional Equipment	Examples: Port adapter, SFP modules, CompactFlash Disk, network interface cables, USB memory modules, transceivers, special connectors, and so on	



Note

Most Cisco documentation is online or on the Cisco Documentation DVD. Documentation that ships with your Cisco 7201 router includes the *Regulatory Compliance and Safety Information for Cisco 7200 Series Routers* document, and the *Cisco 7201 Router Documentation Roadmap* that contains documentation titles and the URLs to them online. See also the “[Related Documentation](#)” section on [page xvii](#).

Cisco 7201 Router Installation Checklist

To assist you with your installation and to provide a historical record of what was done by whom, photocopy the Cisco 7201 Router Installation Checklist, [Table 1-2 on page 1-12](#). Indicate when each procedure or verification is completed. When the checklist is completed, place it in your site log along with the other records for your new router.

Information on replacing internal field-replaceable units (FRUs) is found in [Chapter 4, “Replacing Cisco 7201 Field-Replaceable Units.”](#)

Table 1-2 Cisco 7201 Router Installation Checklist

Task	Verified By	Date
Date router received		
Router and all accessories unpacked		
Types and numbers of interfaces verified		
Safety recommendations and guidelines reviewed		
Installation Checklist copied		
Site log established and background information entered		
Site power voltages verified		
Site environmental specifications verified		
Required passwords, IP addresses, device names, and so on, available		
Required tools available		
Network connection equipment available		
Router mounted in rack (optional)		
Cable-management bracket installed (optional but recommended)		
AC power cable(s) connected to AC source(s) and router; AC cable-retention clip secured		
DC power cable(s) connected to DC source(s) and router		
Network interface cables and devices connected		
ASCII terminal attached to console port		
Console port set for 9600 baud, 8 data bits, no parity, and 1 stop bits (9600 8N1)		
System power turned on		
System boot complete (STATUS LED is on)		
I/O ports and port adapter are operational (see Figure 1-2 for specific LED information)		
Correct hardware configuration displayed after system banner appears		