CHAPTER 2

Preinstallation Requirements

This chapter describes the site requirements and equipment necessary for installing your Cisco 1800 series fixed-configuration integrated services router. This chapter includes the following sections:

Note To see translations of the warnings that appear in this publication, see the *Regulatory Compliance and Safety Information for Cisco 1800 Integrated Services Routers (Fixed)* document and for wireless routers, the *Declarations of Conformity and Regulatory Information for Cisco Access Products with 802.11a/b/g and 802.11b/g Radios* document that accompany your router.

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Warning **Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

Warning **This equipment must be installed and maintained by service personnel as defined by AS/NZS 3260. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected 1) before unplugging the main power connector or 2) while the housing is open, or both.** Statement 1043

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- If you remove the chassis cover, put it in a safe place.
- Keep tools and chassis components away from walk areas.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses when working in conditions that might be hazardous to your eyes.
- Do not perform any action that creates a hazard to people or makes the equipment unsafe.

Safety with Electricity

Warning **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.** Statement 1028

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.** Statement 1001

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. Then, if an electrical accident occurs, you can quickly turn off the power.
- Disconnect all power before doing the following:
  - Installing or removing a chassis
  - Working near power supplies
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- Do not work alone if hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Never open the enclosure of the router's internal power supply.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn off power to the device.
  - If possible, send another person to get medical aid. Otherwise, assess the victim's condition and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

In addition, use the following guidelines when working with any equipment that is disconnected from a power source, but still connected to telephone wiring or other network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for it.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD can occur if electronic printed circuit cards are improperly handled, and can cause complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing modules:

- Ensure that the router chassis is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.
- If no wrist strap is available, ground yourself by touching a metal part of the chassis.

Caution For the safety of your equipment, periodically check the resistance value of the antistatic strap. It should be between 1 and 10 megohms (Mohm).

Additional Warnings for Wireless Routers

Warning **In order to comply with FCC radio frequency (RF) exposure limits, antennas should be located at a minimum of 7.9 inches (20 cm) or more from the body of all persons.** Statement 332

Warning **Do not operate your wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.** Statement 245B

General Safety Guidelines for Wireless Routers

The following are guidelines for the wireless router models:

- Do not touch or move antenna(s) while the unit is transmitting or receiving.
- Do not hold any component containing a radio so that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- The use of wireless devices in hazardous locations is limited to the constraints posed by the local codes, the national codes, and the safety directors of such environments.

General Site Requirements

This section describes the requirements your site must meet for safe installation and operation of your router. Ensure that the site is properly prepared before you begin the installation. If you experience shutdowns or unusually high error rates with your existing equipment, the information in this section can help you isolate the cause of failures and prevent future problems.

Power Supply Considerations

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

Warning **The device is designed for connection to TN and IT power systems.** Statement 1007

The AC power supply includes a 6-foot (1.8-meter) electrical power cord. (A label near the power inlet indicates the correct voltage, frequency [AC-powered systems only], current draw, and power dissipation for the unit.)

Table 2-1 lists power requirements for the Cisco 1800 series fixed-configuration routers.

Table 2-1 Power Requirements for Cisco 1800 Series Fixed-Configuration Routers

Router	Input Power	Input Voltage Tolerance Limits
Without inline power support	100–120V/200–240V, 1.2A/0.6A	90 to 264 VAC
With inline power support	100–120V/200–240V, 1.2A/0.6A	90 to 264 VAC

Site Environment

The Cisco 1800 series fixed-configuration router can be placed on a desktop, installed in a rack, or mounted on a wall or other vertical surface. The location of your router and the layout of your equipment rack or wiring room are extremely important considerations for proper operation. Having equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult. Plan for access to both the front panel and the back panel of the router. When facing the router front-bezel, airflow is from left to right,

When you plan your site layout and equipment locations, keep in mind the precautions listed in the "Site Configuration" section on page 2-5 to help prevent equipment failures and reduce the possibility of environmentally caused shutdowns. If you are experiencing shutdowns or an unusually high number of errors with your existing equipment, these precautions may help you isolate the cause of the failures and prevent future problems.

Wireless LAN Considerations

The type of antenna used with your wireless router and its location greatly impact the quality of wireless connections to the router. Cisco 1800 series fixed-configuration routers are compatible with three different antenna types—swivel-mount dipole antennas that mounts on the back panel of the router, a wall-mount antenna, and a ceiling-mount antenna.

For more information about antenna coverage and optimal usage, see the following documents:

- *Cisco Multiband Swivel-Mount Dipole Antenna*
- *Cisco Multiband Diversity Omnidirectional Ceiling-Mount Antenna*
- *Cisco Multiband Wall-Mount, Corner-Mount, or Mast-Mount Antenna*

Site Configuration

The following precautions will help you plan an acceptable operating environment for your router and will help you avoid environmentally caused equipment failures:

- Ensure adequate air circulation in the room where your router operates. Electrical equipment generates heat. Without adequate air circulation, ambient air temperature may not cool equipment to acceptable operating temperatures.
- To avoid damaging equipment, always follow the ESD-prevention procedures described in the "Preventing Electrostatic Discharge Damage" section on page 2-3. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis cover and module back panels are secure. All empty network module slots, interface card slots, and power supply bays must have filler panels installed. The chassis is designed to allow cooling air to flow within it through specially designed cooling slots. A chassis with uncovered openings permits air leaks, which may interrupt and reduce the flow of air across internal components.

Installation Checklist

The sample installation checklist lists items and procedures for installing a new router. Make a copy of this checklist and record the information in each column as you complete each task. Include a copy of the checklist for each router in your Site Log (described in the "Creating a Site Log" section on page 2-6).

Installation Checklist for Site_____

Router Name_____

Task	Verified by	Date
Installation Checklist copied		
Background information placed in Site Log		
Site power voltages verified		
Installation site power check completed		
Required tools available		
Additional equipment available		
Router received		
Router quick start guide received		

Installation Checklist for Site_____

Router Name_____

Task	Verified by	Date
Regulatory Compliance and Safety Information for Cisco 1800 Integrated Services Routers (Fixed) document received		
Declarations of Conformity and Regulatory Information for Cisco Access Products with 802.11a/b/g and 802.11b/g Radios document received (wireless routers only)		
Product registration card received		
Cisco.com contact information label received		
Chassis components verified		
Initial electrical connections established		
ASCII terminal (for local configuration) or modem (for remote configuration) available		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		
Software image verified		

Creating a Site Log

Use a Site Log to keep a record of all actions related to the router. Keep it in an accessible place near the chassis so that anyone who performs tasks has access to it. Use the Installation Checklist to verify steps in the installation and maintenance of the router. Site Log entries might include the following information:

- Installation progress—Make a copy of the Installation Checklist and insert it into the Site Log. Record information as each procedure is completed.
- Upgrade and maintenance procedures—Use the Site Log as a record of ongoing router maintenance and expansion. A Site Log might include the following events:
  - Installation of network modules
  - Removal or replacement of network modules and other upgrades
  - Configuration changes
  - Maintenance schedules and requirements
  - Performance of maintenance procedures
  - Observations of intermittent problems
  - Comments and notes

Inspecting the Router

Do not unpack the router until you are ready to install it. If the final installation site will not be ready for some time, keep the chassis in its shipping container to prevent accidental damage. Unpack the router only when you are ready to install it.

The router, cables, publications, and any optional equipment that you ordered may be shipped in more than one container. When you unpack the containers, check the packing list to ensure that you received all the following items:

- Router
- 6-foot (1.8-meter) power cord
- Cable management bracket
- RJ-45-to-DB-9 console cable
- DB-9-to-DB-25 connector adapter
- Two swivel-mount dipole antennas (wireless models only)
- Optional equipment (such as network connection cables or rack-mount brackets)
- Cabling and installation document
- *Regulatory Compliance and Safety Information for Cisco 1800 Integrated Services Routers (Fixed)* document
- (Wireless routers only) *Declarations of Conformity and Regulatory Information for Cisco Access Products with 802.11a/b/g and 802.11b/g Radios* document
- *Cisco Router and Security Device Manager (SDM) Quick Start Guide*
- Product Registration card and Cisco.com card

Inspect all items for shipping damage. If anything appears to be damaged, or if you have problems installing or configuring your router, contact customer service. Warranty, service, and support information is given in the cabling and installation document that shipped with your router.

Required Tools and Equipment for Installation and Maintenance

You need the following tools and equipment to install and upgrade the router and its components:

- ESD-preventive cord and wrist strap
- Number-2 Phillips screwdriver
- Flat-blade screwdriver to remove the cover, if you are upgrading memory or other components
- Screws that fit your rack
- Wire crimper
- Wire for connecting the chassis to an earth ground:
  - AWG 14 (2 mm^2) or larger wire for NEC-compliant chassis grounding
  - AWG 18 (1 mm^2) or larger wire for EN/IEC 60950–compliant chassis grounding
- For NEC-compliant grounding, an appropriate user-supplied ring terminal, with an inner diameter of 1/4 inch (5 to 7 millimeters)

In addition, depending on your planned network configuration, you might need the following equipment to connect a port to an external network:

- Ethernet cables for connection to the Fast Ethernet WAN and LAN ports

Note For more information on cable specifications, see the online document *Cisco Modular Access Router Cable Specifications* on Cisco.com.

- Ethernet hub or PC with a network interface card for connection to a Fast Ethernet (LAN) port
- Console terminal (an ASCII terminal or a PC that is running HyperTerminal or similar terminal emulation software) configured for 9600 baud, 8 data bits, 1 stop bit, no flow control, and no parity
- Modem for connection to the auxiliary port for remote administrative access (optional)
- NT1 device for ISDN BRI S/T interfaces (if this device was not supplied by your service provider)
- Wall-mount or ceiling-mount antennas for wireless routers (if you do not intend to use the supplied dipole antennas)