CHAPTER 2

Preparing to Install the Router

This chapter describes site requirements and equipment needed to install Cisco 1600 series routers. It includes the following sections:

- Safety Recommendations
- Site Requirements
- Installation Checklist
- Site Log
- Required Tools and Equipment
- Inspecting the Router
- Ordering and Configuring an ISDN BRI Line

Safety Recommendations

The following guidelines help to ensure personal safety and protect the equipment:

- Keep the chassis area clear and dust-free during and after installation.
- Turn the power supply off and unplug the power cord before opening the chassis.

Warning Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

- 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.

Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

- Wear safety glasses when working under 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

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 shut the power off.
- Before working on the router, turn off the power and unplug the power cord.
- Disconnect all power before doing the following:
  - Installing or removing a chassis.
  - Working near power supplies.
- Do not work alone if hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.

- 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 wet locations.
- 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. It occurs when electronic printed circuit cards are improperly handled and can cause complete or intermittent failures.

When removing and replacing modules, wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip or plug at the other end of the strap to a suitable ground point. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively. The wrist strap and cord should be checked regularly, and should be replaced when necessary.

Caution For the safety of your equipment, periodically check the resistance value of the antistatic strap. It should be between 750 kilohms and 10 megohms.

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 beginning installation. If you are experiencing shutdowns or unusually high errors with your existing equipment, this section can also help you isolate the cause of failures and prevent future problems.

Electrical Requirements

Ensure that your site provides a suitable source of “clean” power (free of spikes and noise). Install a power conditioner if necessary.

Cisco 1600 series routers use an external power supply. The power switch is on the router chassis.

Warning Read the installation instructions before you connect the system to its power source. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

Warning Cisco 1600 routers are designed to work with TN power systems. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

Install proper grounding to avoid damage from lightning and power surges.

Warning Do not touch the power supply when the power cord is connected. For routers with a power switch, line voltages are present within the power supply when the power cord is connected even if the power switch is off. For routers without a power switch, line voltages are present within the power supply when the power cord is connected. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

Site Environment

The layout of your equipment rack or wiring room and the location of individual chassis are extremely important for proper operation of your router. 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 and rear panels of Cisco 1600 series routers.

When planning your site layout and equipment locations, follow these precautions to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns:

- Remember that electrical equipment generates heat. Ambient air temperature may not cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room where your router operates has adequate circulation.
- Never place chassis side by side, because the heated exhaust air from one chassis can be drawn into the intake port of the next.
- Always follow the ESD prevention procedures in the section “Preventing Electrostatic Discharge Damage” earlier in this chapter to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis cover and network interface module rear panels are secure. The chassis is designed to allow cooling air to flow within it. An open chassis allows air leaks, which may in turn interrupt and redirect the flow of air across internal components.

Warning This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors). (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.”)

Installation Checklist

The sample Installation Checklist in Figure 2-1 lists the procedures for hardware installation of a new router. Make a copy of this checklist and mark the entries as you complete each procedure. Include a copy of the checklist for each router in your Site Log (described in the next section, “Site Log”).

Figure 2-1 Installation Checklist

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		
Cisco 1600 series router received		
Printed documentation received, optional documentation CD received or ordered		
Chassis components verified		
Initial electrical connections established		
ASCII terminal or modem attached to console port (for remote configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		
Software image verified		

Site Log

We recommend that you maintain a Site Log, which provides a record of all actions related to the router. Keep it in an accessible place near the chassis where 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:

- Installation progress—Make a copy of the Installation Checklist and insert it into the Site Log. Make entries on the checklist as each procedure is completed.
- Upgrades and removal or replacement procedures—Use the Site Log as a record of ongoing router maintenance and expansion history. A Site Log might include the following events:
  - Installation of network interface modules
  - Removal or replacement of network interface modules
  - Configuration changes
  - Maintenance schedules and requirements
  - Maintenance procedures performed
  - Intermittent problems
  - Related comments
  - Changes and updates to Cisco IOS software

Required Tools and Equipment

Following are the tools and parts required to install the router:

- Number 1 Phillips screwdriver, if wall-mounting the router
- Cable (not included) for each LAN and WAN interface

In addition, you might need the following equipment:

- Ethernet transceiver, for connecting the attachment unit interface (AUI) port
- NT1 for ISDN BRI S/T WAN connections, if not supplied by your service provider (Cisco 1603, ISDN BRI S/T WAN interface card)
- Asynchronous modem, for asynchronous serial connection over analog telephone lines (Cisco 1601, serial WAN interface card)
- Synchronous modem, CSU/DSU, or other data circuit-terminating equipment (DCE), for synchronous serial connection over digital WAN lines (Cisco 1601, serial WAN interface card)
- Console terminal (an ASCII terminal or a PC running terminal emulation software) configured for 9600 baud, 8 data bits, no parity, and 2 stop bits. A terminal is not required if you are using the AutoInstall procedure. Refer to the section "Connecting the Console" in the chapter "Installing the Router" for instructions on connecting a console to the terminal.

Inspecting the Router

Do not unpack the router until you are ready to install it. If the installation site is not ready, keep the chassis in its shipping container to prevent accidental damage.

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

- Cisco 1600 series router
- Console cable (RJ-45-to-RJ-45) with an RJ-45-to-DB-25 adapter
- External power supply with power cord
- Flash memory card (either already installed in the router or in separate bag)
- This publication, optional companion publications, or Cisco Connection Documentation CD, as specified in your order

Depending on the options you selected, your order might also include optional network connection cables.

Inspect all items for shipping damage. If anything appears damaged, or if you encounter problems when installing or configuring your router, contact your local reseller; international customers, contact your local Cisco sales office.

Warning Ultimate disposal of this product should be handled according to all national laws and regulations. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)

Ordering and Configuring an ISDN BRI Line

Before configuring a Cisco 1600 series router that has an ISDN BRI interface, or a Cisco 1600 series router that has an ISDN BRI WAN interface card installed, you should order a correctly configured ISDN BRI line from your telecommunications service provider.

For complete information on ordering and configuring the ISDN BRI line to operate with Cisco 1600 series routers, refer to the appendix “Configuring the ISDN Line.”

Warning The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hardwired connection (other than by nonremovable, connect-one-time-only lug) must be made only by PTO staff or suitably trained engineers. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information for Cisco 1600 Series Routers* document that accompanied the router.)