CHAPTER 2

Preparing to Install Cisco 700 Series Routers

Before installing the Cisco 700 series router, read this chapter carefully for information that will make your installation quicker and easier. This chapter contains the following sections:

- Before Configuring the Router
- Roadmap to This Guide
- Safety Recommendations
- Preventing Electrostatic Discharge Damage
- Inspecting Cisco 700 Series Routers
- Preparing to Make Connections
- Preventing Electromagnetic Interference
- Configuration Port

Before Configuring the Router

Before installing and configuring the Cisco 700 series router, you should gather the information listed in Table 2-1, which is required for a successful configuration. This information is generally available from two sources: the Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) service provider (telephone company) and the network administrator of the central site network.

Definition of Terms

This section defines terms you will encounter when gathering the information required to configure the router. If you are familiar with these terms, fill in Table 2-1.

- ISDN BRI—A digital communication medium that operates over existing analog telephone lines. For more information about ISDN BRI, refer to the section "Integrated Services Digital Network" in the appendix "Internetworking Background."
- Service Profile Identifiers (SPIDs)—Numbers assigned by the ISDN service provider. They are assigned only in North America. SPIDs are numbers used to identify the ISDN B channels. The SPID format is generally the ISDN telephone number with several numbers added to it. Depending on the switch type that supports your ISDN BRI line, your ISDN line might be assigned none, one, or two SPIDs.
- **Directory numbers**—The router's equivalent of telephone numbers. This is the number the router dials to connect to a remote router. ISDN BRI lines are generally assigned two directory numbers, one for each B channel.
- Access code—A number that must be dialed preceding the telephone number to dial outside of a specific telephone system, such as a Centrex system.
- Internet Protocol (IP) address—A network address that uniquely identifies a device on an IP network. An IP address takes the following format:

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• Media Access Control (MAC) address—Also known as a hardware address. This address is assigned by the device manufacturer and takes the following format:

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- Password Authentication Protocol (PAP)—A form of Point-to-Point Protocol (PPP) authentication that requires an exchange of usernames and passwords between two devices. Both devices must support PPP.
- Challenge Handshake Authentication Protocol (CHAP)—A form of PPP authentication that requires an exchange of usernames and passwords between two devices. Both devices must support PPP.
- **Combinet Packet Protocol (CPP)**—A routing protocol that requires an exchange of passwords between two devices. Both devices must support CPP.

Fill in Table 2-1 before configuring the router.

Table 2-1 Required Router Configuration Information

Information Supplied by the Telephone Company		
ISDN switch type:		
First SPID: Second SPID:		
First ISDN directory number: Second ISDN directory number:		
Telephone access codes:		
Information supplied by the Central Site Network Administrator		
ISDN (telephone) number of the central site router:		
Your router's WAN IP address:		
Your router's LAN IP address:		
Central site router's WAN IP address:		
Central site router's LAN IP address:		
Central site routers's MAC-layer address:		
Central site router's system name or host name:		
Central site router's profile name or username:		
CHAP or PAP client password: CHAP or PAP host password:		
CPP authentication client password: CPP authentication host password:		

Roadmap to This Guide

This section contains pointers to information in this guide.

Configuration Examples

This guide contains step-by-step configuration examples based on the routing environment. These configuration examples are contained in the following two chapters:

- "Configuring a Cisco 700 Series Router with a CiscoPro CPA900 or Cisco 700 Series Router"
- "Configuring Cisco 700 Series Routers with a Router Running Cisco IOS Software"

Interoperability with Cisco IOS Software

The appendix "Cisco IOS Software Interoperability with the Cisco 700 Series Routers" describes interoperability issues when connecting the Cisco 700 series routers to a router running Cisco Internetwork Operating System (Cisco IOS) router software.

Ordering an ISDN BRI Line

If you have not yet ordered an ISDN BRI line to support your Cisco 700 series router, refer to the appendix "Provisioning the ISDN BRI Line for Cisco 700 Series Routers." The provisioning information in this appendix will assist you in ordering an ISDN BRI line that optimizes the router's functionality.

Using User Profiles

If you have never used a Cisco 700 series router and are unfamiliar with user profiles, refer to the appendix "Using Profiles with Cisco 700 Series Routers." The operation of the Cisco 700 series routers is based on user profiles.

Internetworking Background Material

If you are not familiar with internetworking technologies and protocols, refer to the appendix "Internetworking Background" before installing or configuring the router.

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, store it in a safe place.
- Keep tools away from walk areas where you and others could trip over them.
- 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 under any conditions that might be hazardous to your eyes.



Warning Read the installation instructions before you connect the system to its power source. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")



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 appendix "Translated Safety Warnings.")

• Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will 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 appendix "Translated Safety Warnings.")

- Locate the emergency power-off switch for the room in which you are working; then if an electrical accident occurs, you can act quickly to shut off power.
- Before working on the system, turn off the power and unplug the power cord.
- Disconnect all power before doing any of the following:
 - Installing or removing a card
 - Working near power supplies
- Never assume that power is been disconnected from a circuit; always check.
- Do not work alone when potentially hazardous conditions exist.
- 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 system.
 - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
 - Determine whether the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) is a transfer of electrostatic charge between bodies of different electrostatic potentials, such as an operator and a piece of electrical equipment. It occurs when electronic components are improperly handled, and it can damage equipment and impair electrical circuitry. Electrostatic discharge is more likely to occur with the combination of synthetic fibers and dry atmosphere.

Always follow ESD-prevention procedures when removing and replacing components. Ensure that the 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 safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis. Always follow the guidelines in the preceding section, "Safety Recommendations."

Do not touch any exposed contact pins or connector shells of interface ports that do not have a cable attached. If cables are connected at one end only, do not touch the exposed pins at the unconnected end of the cable.

Note This device is intended for use in residential and commercial environments only.



Caution Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Inspecting Cisco 700 Series Routers

Keep the Cisco 700 series routers in their shipping containers to prevent accidental damage until you determine where you want to install them; then proceed with unpacking. Check the packing list to ensure that you received the following items:

- Cisco 700 series router
- External power supply
- Power cable
- Double-shielded configuration cable (DB-9-to-DB-9)
- 2 RJ-45-to-RJ-45 cables
- DB-9-to-DB-25 adapter (labeled Terminal)
- Router software diskette
- Cisco ConnectPro software disk
- Cisco Information Packet (includes "Ordering Cisco Documentation")
- This guide
- Cisco ConnectPro User Guide
- Cisco 750 Series and Cisco 760 Series Public Network Certification
- Cisco Connection Documentation, Enterprise Series CD-ROM and optional printed publications, as specified in your order

Inspect all items for shipping damage. If anything appears to be damaged, or if you encounter problems when installing or configuring your system, contact your customer service representative.

Preparing to Make Connections

The ports for the Ethernet, ISDN S/T, ISDN U, and basic telephone service connections are located on the rear panel of the Cisco 700 series routers, as shown in Figure 2-1 through Figure 2-5.





Figure 2-2 Rear Panel Connectors, Cisco 761





Figure 2-3 Rear Panel Connectors, Cisco 762

Figure 2-4 Rear Panel Connectors, Cisco 765



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Figure 2-5 Rear Panel Connectors, Cisco 766

Distance Limitations

When you set up the LAN and WAN connections, be aware of the distance limitations and potential electromagnetic interference (EMI) as defined by the Electronic Industries Association (EIA). Following are the distance limitation specifications for the Ethernet 10BaseT, 10Base2, and ISDN BRI interfaces.

Ethernet

Ethernet 10BaseT (twisted-pair) cable has a maximum segment distance of 328 feet (100 meters).

Ethernet 10Base2 cable has a maximum segment distance of 656 feet (200 meters).

IEEE 802.3 (10Base5 coaxial) cable has a maximum segment distance of 1,640 feet (500 meters) at a transmission rate of 10 Mbps.

ISDN BRI

The specifications for the ISDN BRI cable are listed in Table 2-2.

Specification	High-Capacitance Cable	Low-Capacitance Cable
Resistance (@ 96 kHz ¹)	160 ohms/km	160 ohms/km
Capacitance (@ 1 kHz)	120 nF ² /km	30 nF/km
Impedance (@ 96 kHz)	75 ohms	150 ohms
Wire diameter	0.024" (0.6 mm)	0.024" (0.6 mm)
Distance limitation	32.8' (10 m)	32.8' (10 m)

Table 2-2 ISDN BRI Cable Specifications

1. kHz = kilohertz.

2. nF = nanoFarad.

Warning The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Users should 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 appendix "Translated Safety Warnings.")

Warning The ports labeled "10BaseT," "CONFIG," and "10Base2" are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because the BRI circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the telephone network voltage (TNV) circuits. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

Preventing Electromagnetic Interference

When you run cables for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the cables. The construction of terminal plant cabling has two implications:

- Plant cabling can emit radio interference if it is unshielded for too long a distance.
- Strong electromagnetic interference (EMI), especially when caused by lightning or radio transmitters, can destroy the drivers and receivers in the unit.

If you use twisted-pair cables with a good distribution of grounding conductors in your plant cabling, emitted radio interference is unlikely. If you exceed the maximum distances—although we do not recommend doing this—you should ground the conductor for each data signal for the best results.

If you have cables that exceed the recommended distances, or if you have cables that pass between buildings, consider the effect of lightning strikes or ground loops. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily generate enough energy in unshielded conductors to destroy electronic devices. If your site has experienced this problem, consult experts in lightning suppression and shielding.

Warning Do not work on the system or connect or disconnect cables during periods of lightning activity. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

Most data centers cannot resolve the infrequent but potentially catastrophic problems just described without pulse meters and other special equipment. Take precautions to avoid these problems by creating a properly grounded and shielded environment, and especially consider issues involving electrical surge suppression.

Configuration Port

A DB-9 configuration port is located on the rear panel of the Cisco 700 series routers it is labeled CONFIG. This port connects to a terminal using a DB-9-to-DB-9 console cable. If your terminal or PC console has a DB-25 console connector, use the included DB-25-to-DB-9 adapter.

If you are connecting the router to a Macintosh computer, you will need an RS-422-to-DB-9 cable or an RS-422-to-DB-25 cable. If you are using an RS-422-to-DB-25 cable, use the included DB-25-to-DB-9 adapter to attach the cable to the router.

The configuration port is configured as a data communications equipment (DCE) device. The default parameters for the console port follow: 9600 baud, 8 data bits, no parity, and one stop bit. The configuration port does not support hardware flow control.

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