C H A P T E R 2

Preparing for Installation

This chapter provides safety information and describes the tasks you must perform *before* you install the Cisco Access Server 5100.

This chapter includes information on the following topics:

- Safety recommendations
- General site requirements
- Installation checklist
- Creating a site log
- Distance limitations
- Interference considerations
- Console and auxiliary port considerations
- Network connection considerations
- Inspecting the system

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Keep tools away from walk areas where you and others could fall 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 if you are working under any conditions that might be hazardous to your eyes.

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

Maintaining Safety with Electricity

Follow these guidelines when working on equipment powered by electricity.

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 can weld the metal object to the terminals.

- 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 turn off the power.

- Before working on the system, 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

    — Performing a software upgrade

- Do not work alone if potentially 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 system.

  — If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.

  — Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

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.

Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.

General Site Requirements

This section describes the requirements your site must meet for safe installation and operation of your system. Ensure that your site is properly prepared before beginning installation.

The Access Server 5100 is designed to be rack-mounted in a data processing or telecommunications environment.

Site Environment

The location of individual chassis and the layout of your equipment rack or wiring room are extremely important for proper system operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause system malfunctions and shutdowns, and can make system maintenance difficult.

When planning your site layout and equipment locations, use the precautions in the following sections to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns. If you are currently experiencing shutdowns or unusually high errors with your existing equipment, these precautions may help you isolate the cause of failures and prevent future problems.

Preventive Site Configuration

The following precautions will help you plan an acceptable operating environment for the Access Server 5100 and will help you avoid environmentally caused equipment failures:

- Remember that electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room in which you operate your system has adequate air circulation.

- Always follow the ESD-prevention procedures in the section "Preventing Electrostatic Discharge Damage" to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Configuring Equipment Racks

The following tips will help you plan an acceptable equipment rack configuration:

- Enclosed racks must have adequate ventilation. Ensure that the rack is not overly congested because each unit generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.

- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or the exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated all the way into the rack.

- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack.

- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which you can find by trying different arrangements.

- When equipment installed in a rack, particularly in an enclosed rack, fails, try operating that equipment only, if possible. Turn off other equipment in the rack (and in adjacent racks) to allow the unit under test a maximum of cooling air and clean power.

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.

Caution   To avoid damage from lightning and power surges, install proper grounding.

Installation Checklist

The installation checklist lists the procedures for initial hardware installation of a new Access Server 5100. Make a copy of this checklist and mark the entries as you complete each procedure. Include a copy of the checklist for each system in your site log.

Installation checklist for site _____

Task	Verified by	Date
Installation checklist copied		
Background information placed in the site log		
Environmental specifications verified		
Site power voltages verified		
Installation site prepower check completed		
Required tools available		
Additional equipment available		
Unit received		
UniverCD or printed documentation received		
Chassis components verified		
Software version verified		
Initial electrical connections established		
ASCII terminal attached to the console port		
Modem attached to the console port (for remote configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial system operation verified		

LAN interface name _____

Unit serial number _____

Creating a Site Log

The site log provides a historical record of all actions relevant to the Access Server 5100. Keep the site log in an easily 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 your system. 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 you complete each procedure.

- Upgrades and maintenance procedures

  Use the site log as a record of ongoing system maintenance and expansion history. Each time a procedure is performed on the system, update the site log to reflect the following:

  — Configuration changes

  — Maintenance schedules and requirements

  — Corrective maintenance procedures performed

  — Intermittent problems

  — Related comments and notes

Distance Limitations

When setting up your Access Server 5100, consider distance limitations and potential electromagnetic interference (EMI) as defined by the Electronic Industries Association (EIA). Following are the distance limitation specifications for Ethernet and serial interfaces.

Ethernet Connections

The distance limitations for the IEEE 802.3 10BaseT specification indicate a maximum segment distance of 325 feet (100 m) at a transmission rate of 10 megabits per second (Mbps).

Serial Connections

As with all signaling systems, EIA/TIA-232 signals can travel a limited distance at any given bit rate; generally, the slower the data rate, the greater the distance. Table 2-1 shows the standard relationship between baud rate and maximum distance.

Table 2-1   EIA/TIA-232 Speed and Distance Limitations

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
2400	200	60
4800	100	30
9600	50	15
19200	25	7.6
38400	12	3.7

Caution   EIA/TIA-232 is often used at greater distances than those specified in Table 2-1. If you understand the electrical problems that can arise and can compensate for them, you might still be able to get good results; however, do so at your own risk. We recommend that you stay within the distances defined by the standard.

The use of balanced drivers allows EIA/TIA-449 signals to travel greater distances than the EIA/TIA-232 standard. Table 2-2 lists the standard relationship between baud rate and maximum distance for EIA/TIA-449 signals. These limits are also valid for V.35 and X.21.

Table 2-2   EIA/TIA-449 Speed and Distance Limitations

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
2400	4,100	1,250
4800	2,050	625
9600	1,025	312
19200	513	156
38400	256	78
56000	102	31
T1	50	15

Caution   The EIA/TIA-449 and V.35 interfaces support data rates up to 2.048 Mbps. Exceeding this maximum could result in loss of data and is not recommended; *do so at your own risk*.

Interference Considerations

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

- Plant cabling can emanate radio interference if it is unshielded for too long a distance.

- Strong EMI, especially that caused by lightning or radio transmitters, can destroy the EIA/TIA-232 drivers and receivers in the Access Server 5100.

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, ground the conductor for each data signal; however, this practice is not recommended.

If you have cables exceeding recommended distances, or if you have cables that pass between buildings, give special consideration to the effect of lightning strikes or ground loops. The electromagnetic pulse caused by lightning or other high-energy phenomena can

easily couple enough energy into unshielded conductors to destroy electronic devices. If your site has experienced this type of problem, consult experts in lightning suppression and shielding.

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 providing a properly grounded and shielded environment, and electrical surge suppression.

To prevent EMI, consult experts in radio-frequency interference (RFI).

AS51 Console and Auxiliary Port Considerations

Before connecting the AS51 network application card (NAC) console and auxiliary ports, read the following sections.

Console Port Connections

The AS51 NAC has an RJ-45 console asynchronous serial port. This port connects to a terminal using an RJ-45-to-DB-25 adapter. Depending on the adapter used, this port becomes a data communications equipment (DCE) device or a data terminal equipment (DTE) device. To use the terminal as a console you should use a DCE RJ-45-to-DB-25 adapter. The default parameters for the console port are 9600 baud, 8 data bits, no parity generated or checked, and 1 stop bit. The console port does not support hardware flow control.

Auxiliary Port Connections

An RJ-45 auxiliary asynchronous serial port is included on the AS51 NAC. This port connects to a modem for network access using an RJ-45-to-DB-25 adapter. The adapter you use turns this port into a DCE device or a DTE device. For connection to a channel service unit/digital service unit (CSU/DSU) or protocol analyzer, you should use a DTE RJ-45-to-DB-25 adapter.

Network Connection Considerations

Read this section to prepare for your network connections.

Ethernet Connections

Use 10BaseT cables and connectors to cable the AS51 NAC directly to the network.

Asynchronous Serial Connections

The two asynchronous serial ports on the AS51 NIC use 68-pin SCSI connectors, providing connections for 8 asynchronous ports each. A breakout cable that divides into two 50-pin D-type connectors is connected to each asynchronous port.

Inspecting the System

Do not unpack the Access Server 5100 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. When you have determined where you want the Access Server 5100 installed, proceed with the unpacking.

The chassis, cables, UniverCD or printed 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 received the following items:

- Access Server 5100

- 6-foot (1.8-meter) power cord

- Console cable (RJ-45) with RJ-45-to-DB-25 adapter

- Optional equipment (such as network interface cables, asynchronous breakout cables, auxiliary cable, and so forth)

- The warranty pack

- UniverCD and optional printed publications (including this publication), as specified by 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 a customer service representative.

Getting Your System Running

If your Access Server 5100 was shipped assembled, take the following steps to get your system up and running:

- Connect the chassis to a power source

- Connect a console to each AS51 NAC

- Connect breakout cables from each AS51 network interface card (NIC) to the quad modem NICs

- Connect the AS51 NAC to your network

- Power on the Access Server 5100

- Configure the AS51 NAC software

- Connect to each modem via telnet, and issue modem configuration commands

- Connect to the T1 operator interface, and configure the T1 NAC (if applicable)

- Connect to the network management card operator interface, and configure the network management NAC (if applicable)

See the appropriate sections in this manual for specific instructions.