Preparing for Installation

Safety Recommendations and Warnings

Please read the following safety guidelines before you install this product:

- Review the safety warnings listed in Regulatory Compliance and Safety Information for the Cisco 5400 Enterprise Network Compute System before installing, configuring, or maintaining the device.

- Keep the chassis area clean and dust-free during and after installation.

- Keep the chassis in a safe place when you remove the chassis cover.

- Do not wear loose clothing that could get caught in the chassis.

- 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 general guidelines when working on equipment that is powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. 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 internal power supply.

- If an electrical accident occurs, proceed as follows:

    - Turn off power to the device.

    - Call for help.

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

Follow these guidelines when working with any equipment that is disconnected from a power source but is 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.

- Remove power cables from all installed power supplies before opening the chassis.

Always follow these electrostatic discharge (ESD) prevention procedures when removing and replacing modules:

- Ensure that the router chassis is electrically connected to 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.

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

Site Requirements

Follow the general precautions listed below when installing or working with your device:

- Keep your system components away from radiators and heat sources.

- Do not block cooling vents.

- Ensure that the chassis cover and module rear 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, in turn, may interrupt and reduce the flow of air across internal components.

- 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 can be found by experimenting with different configurations.

- Do not spill food or liquid on any system components and do no operate in a wet environment.

- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components.

- Route system cables, and the power supply cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.

- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules.

- If you turn off your system, wait at least 30 seconds before turning it on again to avoid system component damage.

Temperature, humidity, altitude, and vibration can affect the performance and reliability of the router. After installation, ensure that the site maintains the environmental characteristics shown in this table:

Environmental Characteristic	Minimum	Maximum
Steady State Operating	0 degree C	40 degree C (40 degrees C at 10,000 feet)
Storage	-20 degrees C	+70 degrees C
Humidity operating (noncondensing)	10%	90%
Humidity nonoperating (noncondensing)	5%	95%
Altitude operating: over allowable temperature range (0 to 40 degrees C)	-500 feet	10,000 feet
Altitude, nonoperating: over allowable temperature range	-1000 feet	50,000 feet
Thermal shock non-operating with change over time of 3 minute	-25 degrees C	+70 degrees C
Thermal Shock - Operating at 2.5 degree C per minute	0 degrees C	+40 degrees C

Note   When an equipment that is installed in a rack (particularly in an enclosed rack) fails, try, if possible, to operate the equipment in isolation. Power off other equipment in the rack (and in adjacent racks) to allow the equipment to be tested in a condition that has maximum cool air and clean power.

Mounting Requirements

The height, width, depth and weight of the chassis are displayed in this table:

Characteristic	Measurement
Height	1.73 inches (4.39 cm) — 1RU rack-mount
Width	17.25 inches (43.815 cm) — 19 inch rack-mount
Depth	13.8 inches (35.052 cm) (including card handles and power supply handles)
Weight	13 lbs. (5.9 kg)

To place the system in a proper location, it is necessary to know the dimensions of the device's chassis.

The Cisco 5400 ENCS can be placed on a desktop or installed in a rack. The mounting ears for the device are designed for #12-24 UNC screws.

The location of your device and the layout of your equipment rack or wiring room are extremely important considerations for proper operation. 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 front and rear panels of the device.

This information can help you plan the rack configuration for your equipment:

- Allow clearance around the rack for maintenance.

- Allow at least one rack unit of vertical space between devices.

- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each device generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above it.

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

Power Guidelines and Requirements

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.

The AC power supply supports either 110V or 220V operation. All units include 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.)

Network Cabling Specification

- Ethernet cables for RJ45 ports

- Serial or console cables used to connect devices like routers

- Shielded USB cables with properly terminated shields for the USB port

- Standard Shielded Cable with 15-Pin VGA Male Connector

Required Tools and Equipment

You will need the following equipment to install the device and its equipment:

- ESD-preventive cord and wrist strap

- Phillips screwdrivers: small, 3/16-in. (4 to 5 mm), and medium, 1/4-in. (6 to 7 mm)

- Screws that fit your rack

- Wire crimper for chassis grounding - to be used along with the ground lug kit

- One AWG 6 cable for the ground lug kit

Note The ground lug is for chassis grounding and is NEBS compliant.

In addition, depending on the type of modules you plan to use, you might need the following equipment to connect a port to an external network

- Cables for connection to the WAN and LAN ports (dependent on the configuration)

Note If you order the required cables when you purchase the device, the cables ship along with the product.