C Series Controllers

C3000 and C5000 Hardware Guide

Published: 2013-07-02

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

C3000 and C5000 Controller Hardware Guide

Revision History
March 2013—Updated the procedure for connecting AC power.
June 2011—Updated fan module serial number location information.
May 2011—Updated the number of subscribers.
March 2011—Updated DC power range.
October 2010—Initial release.

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement (“EULA”) posted at http://www.juniper.net/support/eula.html. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

List of Figures

List of Tables

About the Documentation

SRC Documentation and Release Notes

For a list of related SRC documentation, see http://www.juniper.net/techpubs/software/junos/.

If the information in the latest *SRC Release Notes* differs from the information in the SRC guides, follow the *SRC Release Notes*.

Audience

This documentation is intended for experienced system and network specialists working with routers running Junos OS and JunosE software in an Internet access environment. We assume that readers know how to use the routers, directories, and RADIUS servers that they will deploy in their SRC networks. If you are using the SRC software in a cable network environment, we assume that you are familiar with the PacketCable Multimedia Specification (PCMM) as defined by Cable Television Laboratories, Inc. (CableLabs) and with the Data-over-Cable Service Interface Specifications (DOCSIS) 1.1 protocol. We also assume that you are familiar with operating a multiple service operator (MSO) multimedia-managed IP network.

Documentation Conventions

Table 1 on page xii defines the notice icons used in this guide. Table 2 on page xii defines text conventions used throughout this documentation.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2: Text Conventions

Convention	Description	Examples
Bold text like this	• Represents keywords, scripts, and tools in text. • Represents a GUI element that the user selects, clicks, checks, or clears.	• Specify the keyword **exp-msg**. • Run the **install.sh** script. • Use the **pkgadd** tool. • To cancel the configuration, click **Cancel**.
Bold text like this	Represents text that the user must type.	**user@host# set cache-entry-age *cache-entry-age***

`Fixed-width text like this`	Represents information as displayed on your terminal's screen, such as CLI commands in output displays.	`nic-locators {`
		`  login {`
		`  resolution {`
		`  resolver-name /realms/`
		`  login/A1;`
		`  key-type LoginName;`
		`  value-type SaeId;`
		`  }`

Regular sans serif typeface	• Represents configuration statements. • Indicates SRC CLI commands and options in text. • Represents examples in procedures. • Represents URLs.	• **system ldap server{ stand-alone;** • Use the **request sae modify device failover** command with the **force** option • **user@host# ...** • **http://www.juniper.net/techpubs/software/management/src/api-index.html**
Italic sans serif typeface	Represents variables in SRC CLI commands.	user@host# set local-address ***local-address***
Angle brackets	In text descriptions, indicate optional keywords or variables.	Another runtime variable is <gfwif>.
Key name	Indicates the name of a key on the keyboard.	Press Enter.

Table 2: Text Conventions *(continued)*

Key names linked with a plus sign (+)	Indicates that you must press two or more keys simultaneously.	Press Ctrl + b.
Italic typeface	• Emphasizes words. • Identifies book names. • Identifies distinguished names. • Identifies files, directories, and paths in text but not in command examples.	• There are two levels of access: *user* and *privileged*. • *SRC PE Getting Started Guide* • *o=Users, o=UMC* • The */etc/default.properties* file.
Backslash	At the end of a line, indicates that the text wraps to the next line.	Plugin.radiusAcct-1.class=\ net.juniper.smgt.sae.plugin\ RadiusTrackingPluginEvent
Words separated by the | symbol	Represent a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable may be either optional or required.)	diagnostic | line

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at https://www.juniper.net/cgi-bin/docbugreport/ . If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf .
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/ .
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://www.juniper.net/alerts/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html.

PART 1

Overview of the C Series Controller

CHAPTER 1

Overview of the C Series Controller

C Series System Description

The C Series Controller enables you to easily install, configure, and support Juniper Networks Session and Resource Control (SRC) software. It provides easy access to troubleshooting information, such as reporting events, logs, and system dumps while providing session resource controller functionality.

There are two C Series Controller models: the C3000 model and the C5000 model. Each model is composed of four hard drives, three fan modules, redundant power supplies, one USB port, a console management port, and four Ethernet ports.

Both models use the same software. However, the specific model determines the number of service session licenses and concurrent subscribers allowed on each unit. (See Table 3 on page 3.)

Table 3: C Series Model Differences

Model	Concurrent Subscribers
C3000	300,000
C5000	900,000

NOTE: The models illustrated in this book might look different from your model because of configuration variations.

Figure 1: Front View of the C3000 Model

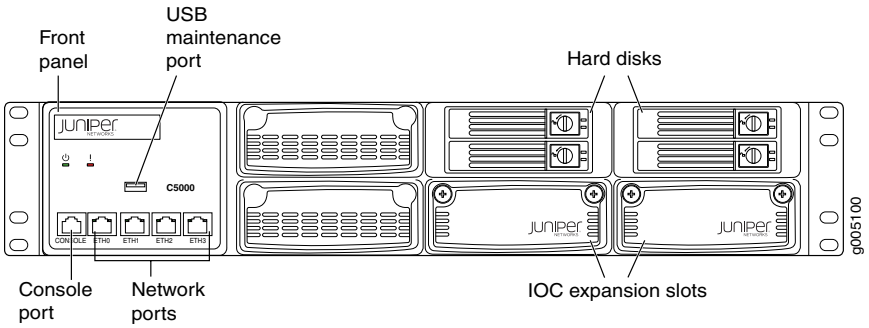


Figure 2: Front View of the C5000 Model

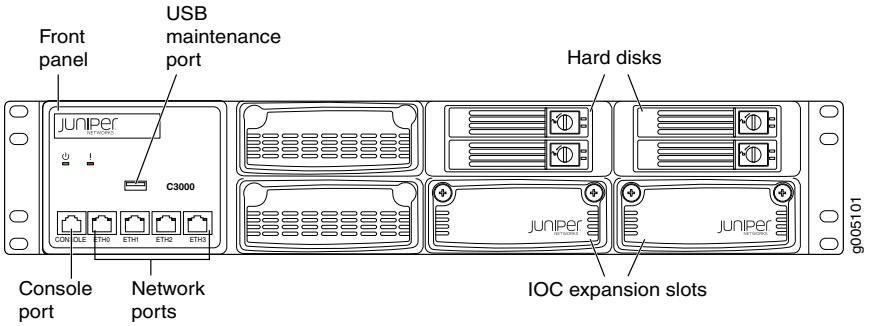
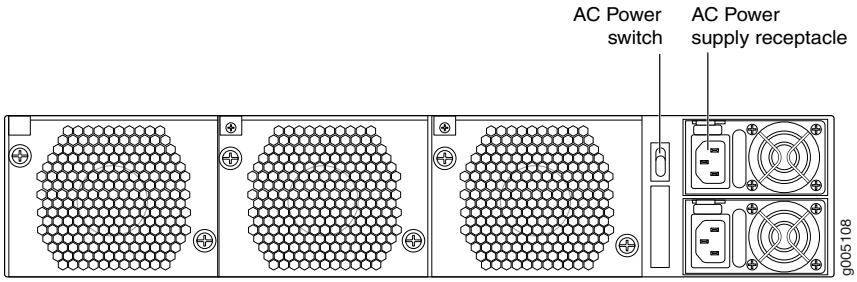


Figure 3: Rear View of the C3000 and C5000 Models



Related Documentation

- C Series Network Management Tools on page 4
- C Series Model Components on page 7

C Series Network Management Tools

You can use different management tools to configure the system to meet the specific networking requirements.

- CLI Management on page 5
- SNMP MIB Management on page 5

CLI Management

The command-line interface (CLI) provides fully developed and automated configuration and status functionality through a local RS-232 port, Telnet, or SSH over any reachable network. For a full discussion of the CLI, see the *SRC PE CLI User Guide*.

SNMP MIB Management

The system offers a complete SNMP interface for configuration, status, and alarm reporting. For more information, see the *SRC PE Monitoring and Troubleshooting Guide*.

Related Documentation

- C Series System Description on page 3
- C Series Model Components on page 7
- C Series Configuration Overview on page 39

CHAPTER 2

C3000 and C5000 Controller Hardware Components

C Series Model Components

The C3000 model and C5000 model contain the following components:

- Internal memory
- CPU
- Hard drive—Each model has four hot-swappable, redundant drives in a redundant array of independent disks (RAID) 1+0 (mirror) configuration. The hard drives are located in the front of the C Series chassis.
- Fans—Three hot-swappable fan modules located in the rear of the chassis provide front to back cooling.
- Power supply—Each model has two hot-swappable, redundant AC or DC power supplies located in the rear.
- Console management port—Each model has one RS-232 port that accepts a DB-9 (female) connector for direct CLI access from a console terminal.
- USB port—Each model has one port that can be used for memory storage devices.
- IPMI 2.0 management interface.
- Ethernet interfaces—Each model has four 10/100/1000Base-T Ethernet ports (**ETH0** through **ETH3**) that accept an RJ-45 (male) connector, providing an out-of-band connection for LAN access through a Telnet session, SSH, or SNMP. The **ETH0** port provides access from a network that is behind a firewall. The **ETH0** port provides remote access to the IPMI module for remote hardware status monitoring, power management, and serial over LAN (SOL) access. The **ETH1** port provides access for applications on an external network, such as the Internet.

- Status LEDs—Each model has LEDs that provide status information about hard drives, power supplies, and interfaces.
- USB storage device—Contains the latest system software, including the operating system for the C Series Controller. The device can be read-only or read/write and should be used to recover from a major software failure. See the *SRC Getting Started Guide* for more information about recovering from a software failure.

  NOTE: From SRC software release 4.5, the USB storage device supplied with the C Series Controller can be a read/write USB or a read-only USB and prior to the release 4.5, the C-Series was shipped only with a read-only USB. You can only recover the system software and cannot create an installation medium or back up the system configuration by using a read-only USB storage device.

  For identifying a read-only USB or a read/write USB, contact Juniper Networks Technical Assistance Center (JTAC).

- Rack-mount and rail kit.

Related Documentation

- C Series System Description on page 3
- C3000 and C5000 Front Panel Description on page 8
- C3000 and C5000 Power Supply Description on page 10
- C3000 and C5000 Fan Module Description on page 12
- C3000 and C5000 Hard Disk Description on page 13

C3000 and C5000 Front Panel Description

The front panel is located on the left side of C3000 and C5000 Controllers.

The front panel LEDs and ports are described in:

- LEDs on the Front Panel on page 8
- Ports on the Front Panel on page 9

LEDs on the Front Panel

Table 4 on page 9 contains the LEDs located on the front panel of the C3000 and C5000 Controllers (see Figure 4 on page 9).

Figure 4: C3000 and C5000 Front Panel LEDs

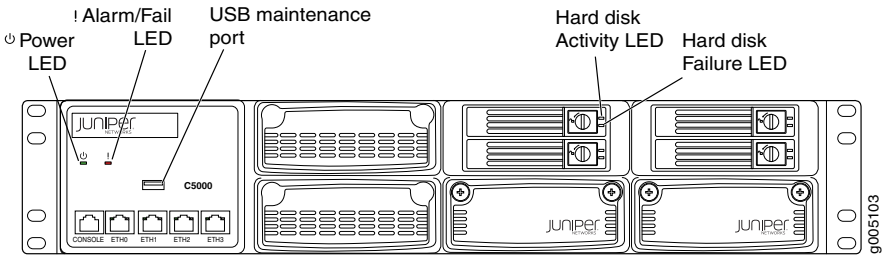


Table 4: Front Panel LEDs

LED	Color	State	Description
Chassis	Green	On steadily	Indicates that the chassis is powered on
	–	Off	Indicates that the chassis is powered off
Alarm/Fail	Red	On steadily	Indicates that a fan module, power supply, or temperature alarm has occurred
		Flashing	Indicates a hardware failure
LAN status	Green	Flashing	Indicates that the link is active
Speed status	–	Off	Indicates a 10-Mbps link speed
	Green	Flashing	Indicates a 100-Mbps link speed
	Yellow	Flashing	Indicates a 1-Gbps link speed

Ports on the Front Panel

Table 5 on page 9 displays the ports that are located on the front panel of C3000 and C5000 Controllers.

Table 5: Front Panel Ports

Port	Description
Console	One RJ-45 console port
Network	Four RJ-45 Ethernet 10/100/1000
USB	One USB maintenance port

Related Documentation

- C3000 and C5000 RJ-45 Console Connector Pinouts on page 81

C3000 and C5000 Power Overview

C3000 and C5000 Power Supply Description

C3000 and C5000 Controllers ship with dual power supplies. In addition to providing power to the controller, the power supplies provide a fan that helps cool the system. The power supply slots are located on the far-right side of the rear panel of the controller. Power supplies are field-replaceable and hot-swappable.

The power supplies are controlled by a momentary switch. Pressing the switch reboots the chassis. Holding the switch down forces a hard shutdown.

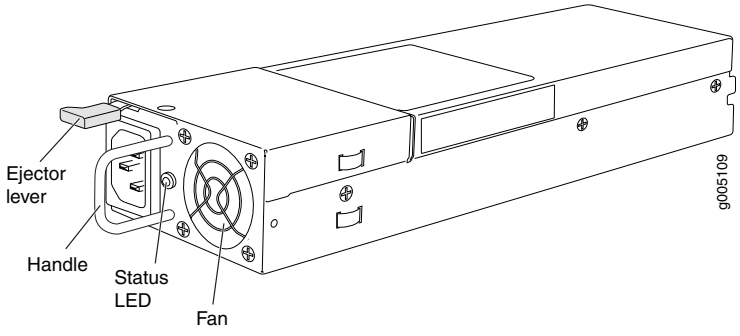
A single power supply provides power to all components. One power supply is required. A second power supply provides redundancy. If a power supply in a redundant configuration fails, the operational power supply takes over without interruption and assumes responsibility for the entire power load.

AC Power Supply Description

Each AC power supply contains an AC power input, status LED, eject lever, and handle, as shown in Figure 5 on page 10.

Each inlet requires a dedicated AC power feed and a dedicated customer site circuit breaker. For existing power supplies, we recommend that you use a minimum 5 A (110 VAC) customer site circuit breaker, or as required by local code.

Figure 5: C3000 and C5000 AC Power Supply

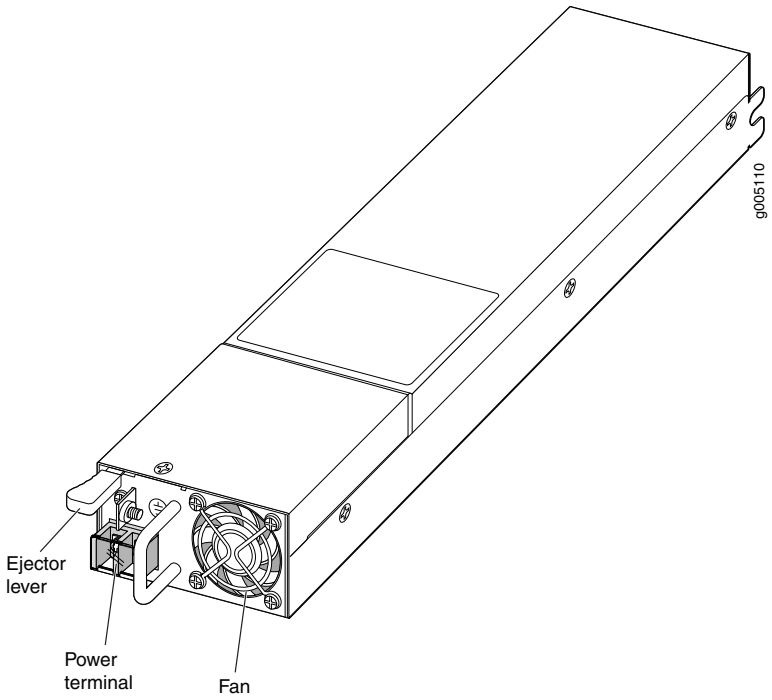


DC Power Supply Description

Each DC power supply contains a single DC power input, status LED, eject lever, and handle, as shown in Figure 5 on page 10.

The DC power input (–48 VDC and return) requires a dedicated customer site circuit breaker. We recommend that you use a dedicated customer site circuit breaker rated for 10 A (–48 VDC) minimum, or as required by local code.

Figure 6: C3000 and C5000 DC Power Supply



Related Documentation

- C3000 and C5000 Power Supply LED on page 11
- Connecting Power to an AC-Powered C3000 or C5000 Controller on page 33
- Connecting Power to a DC-Powered C3000 or C5000 Controller on page 34
- AC Power Electrical Specifications for the C Series Controller on page 77
- DC Power Electrical Specifications for the C Series Controller on page 79

C3000 and C5000 Power Supply LED

Each power supply has a single bicolor LED to indicate status, as shown in Table 6 on page 11.

Table 6: C3000 and C5000 Power Supply LEDs

Color	State	Description
Green	On steadily	Indicates that the power supply is functioning normally

Table 6: C3000 and C5000 Power Supply LEDs *(continued)*

Color	State	Description
Yellow	On steadily	Indicates that the power supply is in Standby Mode, which means the power supply is powered but is not powering the system
–	Off	Indicates one of the following: • Power supply is disconnected from AC power feed. • AC power input voltage is not within normal operating range. • There is no AC power input.

Related Documentation

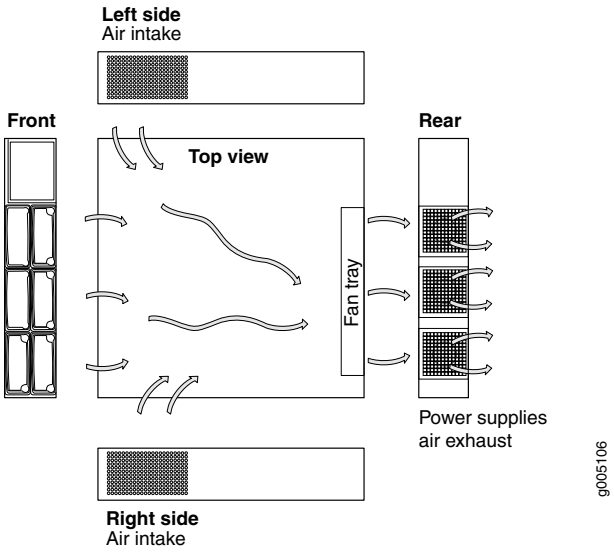
- C3000 and C5000 Power Supply Description on page 10
- Connecting Power to an AC-Powered C3000 or C5000 Controller on page 33
- Connecting Power to a DC-Powered C3000 or C5000 Controller on page 34
- AC Power Electrical Specifications for the C Series Controller on page 77
- DC Power Electrical Specifications for the C Series Controller on page 79

C3000 and C5000 Fan Module Description

The C3000 and C5000 Controllers have three individual cooling fan modules that work together to keep all components within the acceptable temperature range. The fan modules install in the rear of the controller and are hot-swappable.

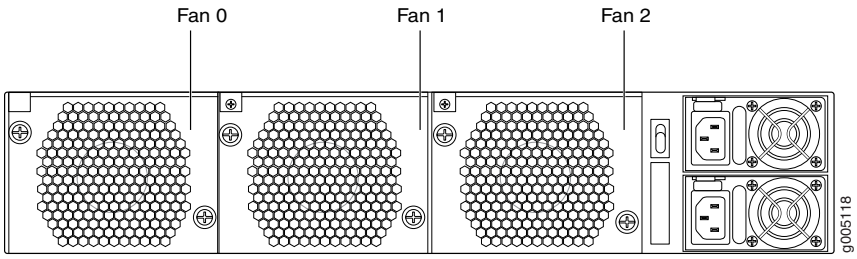
The air intake is located on the front sides of the chassis. Air is pulled through the chassis and is exhausted out the rear by the fans. The power supplies are self-cooling and are located in the rear of the controller to the right of the fans. The exhaust for the power supplies is located on the right side of the rear of the chassis.

Figure 7: Airflow Through the C3000 and C5000 Controllers



The chassis monitors the temperature of the components. When the controller is operating normally, the fan modules function at lower than full speed. If a fan module fails or the ambient temperature rises above a threshold, the speed of the remaining fan modules is automatically adjusted to keep the temperature within the acceptable range. If the ambient maximum temperature specification is exceeded and the system cannot be adequately cooled, the system shuts down by disabling output power from each power supply.

Figure 8: C3000 and C5000 Cooling Fan Modules



Related Documentation

- Replacing a C3000 or C5000 Fan Module on page 51

C3000 and C5000 Hard Disk Overview

C3000 and C5000 Hard Disk Description

The C3000 and C5000 Controllers ship with four 146-GB hard disks. The hard disks provide a fully redundant storage system on the controllers; all directories and files saved

on one hard disk are also saved on the other hard disk. The hard disks can be installed in the hard disk slots and provide the following functions:

- Mirroring—Copy data to more than one disk
- Striping—Split data across more than one disk
- Error correction—Provide redundant data storage to detect and resolve problems

The controllers use a redundant array of independent disk (RAID) 1+0 configuration to store and replicate data among multiple hard disk drives. In a RAID 1+0 configuration, drives are striped for performance and duplicated for fault tolerance.

Related Documentation

- C3000 and C5000 Hard Disk LEDs on page 14
- Maintaining the C Series Hard Disks on page 48

C3000 and C5000 Controller Data Storage

A C Series Controller provides data redundancy by supplying four hard drives (or disks) in a redundant array of independent disks (RAID). Disks are configured as a RAID level-1 Enhanced (RAID 1E) array , which combines mirroring and striping for high performance and redundancy. If one disk becomes inoperable, the RAID controller switches read and write requests to the remaining functional drives in the array, which allows the C Series Controller to continue to function.

When you replace a faulty disk, or disable and then enable a disk, the RAID controller copies the data from the other disks in the array to the new or enabled disk and establishes mirroring and striping for the disk array.

The disks mount from the front of the chassis on both the C3000 and C5000 systems.

When you access the disks in the disk mount:

- Disk 0 is on the top left.
- Disk 1 is on the bottom left.
- Disk 2 is on the top right.
- Disk 3 is on the bottom right.

Related Documentation

- C3000 and C5000 Hard Disk Description on page 13
- C3000 and C5000 Hard Disk LEDs on page 14
- Maintaining the C Series Hard Disks on page 48

C3000 and C5000 Hard Disk LEDs

Each hard disk has two LEDs to indicate status, as shown in Table 7 on page 15.

Table 7: C3000 and C5000 Hard Disk LEDs

Color	Location	State	Description
Green	Top	On steadily	Indicates hard disk activity
Red	Bottom	On steadily	Indicates a hard disk failure

Related Documentation

- C3000 and C5000 Hard Disk Description on page 13
- Maintaining the C Series Hard Disks on page 48

PART 2

Setting Up the C3000 and C5000 Controllers

CHAPTER 3

Preparing the Site for C3000 and C5000 Controller Installation

C3000 and C5000 Site Preparation Checklist

The checklist in Table 8 on page 19 summarizes the tasks you must perform when preparing a site for controller installation.

Table 8: C Series Site Preparation Checklist

Item or Task	For More Information	Performed By	Date
Verify that environmental factors such as temperature and humidity do not exceed controller tolerances.	"C3000 and C5000 Controller Environmental Specifications" on page 75		
Select the type of rack.	"C3000 and C5000 Controller Rack Requirements" on page 20		
Plan rack or cabinet location, including required space clearances.	• C3000 and C5000 Controller Rack Requirements on page 20 • C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance on page 22		
If a rack is used, secure it to the floor and building structure.	"C3000 and C5000 Controller Rack Requirements" on page 20		
Acquire cables and connectors.			
Measure the distance between external power sources and the controller installation site.			

Related Documentation

- C3000 and C5000 Installation Summary on page 23
- Unpacking the C Series Controller on page 25
- C Series Configuration Overview on page 39

C3000 and C5000 Controller Rack Requirements

The controller can be installed in a rack. Many types of racks are acceptable, including four-post (telco) racks and open-frame racks. An example of an open-frame rack appears in Figure 9 on page 21. Table 9 on page 20 summarizes rack requirements and specifications for the C Series Controllers.

Table 9: C Series Rack Requirements and Specifications

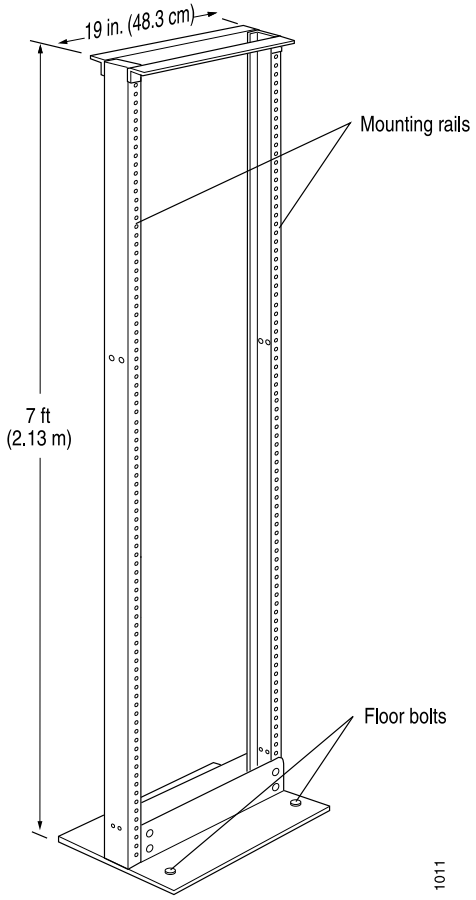
Rack Requirement	Guidelines
Rack type and mounting bracket hole spacing	Use a four-post rack or a two-post rack. You can mount the controller on any four-post or two-post rack that provides bracket holes or hole patterns spaced at 1 U (1.75-in. or 4.44-cm) increments and that meets the size and strength requirements specified in this table. A U is the standard rack unit defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org).

Rack size and strength	• Ensure that the rack is a 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org).
	• Ensure that the rack is one of the following standard lengths:
	  ◦ 23.62 in. (600 mm)
	  ◦ 30.0 in. (762 mm)
	  ◦ 31.5 in. (800 mm)
	• The rack rails must be spaced widely enough to accommodate the controller chassis's external dimensions: 3.5 in. (8.8 cm) high, 23.5 in. (59.7 cm) deep, and 17.26 in. (43.7 cm) wide. The outer edges of the mounting brackets extend the width to 19.2 in. (48.7 cm). The spacing of rails and adjacent racks must also allow for the clearances around the controller and rack, which are specified in "C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance" on page 22.
	• The C Series Controller ships with the mounting brackets installed in the front-mount position. You can also move the brackets to the center-mount position to install the controller in a two-post rack. For instructions about center mounting the controller, see "Installing the C Series Controller in a Two-Post Rack" on page 30.
	• The chassis height of 3.5 in. (8.8 cm) is approximately 2 U. You can stack several controllers in a cabinet that has sufficient usable vertical space. Each controller requires 2 U.
	• The rack must be strong enough to support the weight of the fully configured controller, up to 43.31 lb (19.65 kg).
	• Ensure that the spacing of rails and adjacent racks allows for the proper clearance around the controller and rack as specified in "C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance" on page 22.
	• Install heavier systems on the bottom of the rack. Mount lighter systems higher in the rack.
	• Install and electrically ground racks according to manufacturer instructions.

Table 9: C Series Rack Requirements and Specifications *(continued)*

Rack Requirement	Guidelines
Rack connection to the building structure	• Secure the rack to the building structure. • If earthquakes are a possibility in your geographical area, secure the rack to the floor. • Secure the rack to the ceiling brackets, as well as to floor brackets for maximum stability.

Figure 9: Typical Open-Frame Rack



Related Documentation

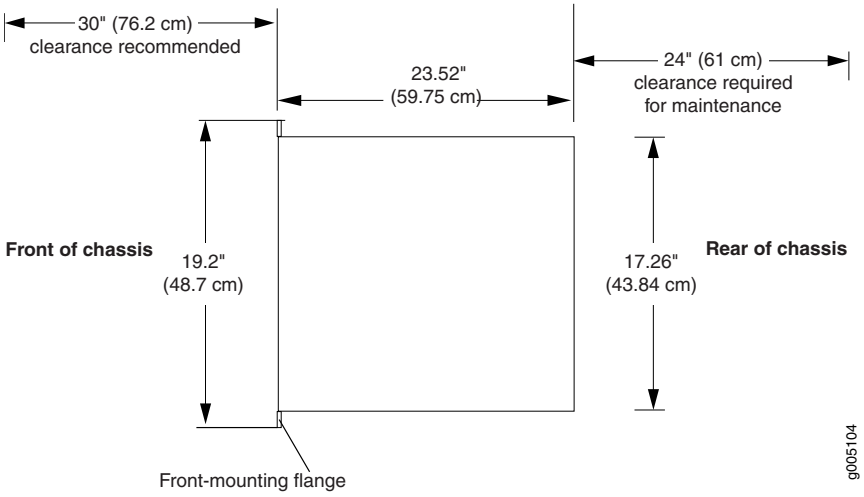
- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance on page 22
- C3000 and C5000 Installation Summary on page 23

C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance

When planning the installation site, allow sufficient clearance around the rack (see Figure 10 on page 22):

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow at least 6 in. (15.2 cm) of clearance between side-cooled controllers. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the controller. Allow at least 24 in. (61 cm) both in front of and behind the controller.

Figure 10: C Series Chassis Dimensions and Clearance Requirements



Height: 3.5" (8.8 cm)

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Controller Rack Requirements on page 20
- C3000 and C5000 Installation Summary on page 23

CHAPTER 4

Overview of C3000 and C5000 Controller Installation

C3000 and C5000 Installation Summary

To install the C Series Controller:

1. Prepare your installation site.

   See "C3000 and C5000 Site Preparation Checklist" on page 19.

2. Review the safety guidelines and warnings.
   - C3000 and C5000 Safety Notices on page 65
   - C3000 and C5000 General Safety Guidelines on page 67
3. Unpack the controller and verify the parts.
   a. Unpacking the C Series Controller on page 25
   b. Verifying the C Series Controller Parts Received on page 26
4. Install the mounting hardware if needed, and install the controller in a rack.
   - Installing the C Series Controller in a Two-Post Rack on page 30
   - Installing the C Series Controller in a Four-Post Rack on page 29
5. Connect cables to the network and external devices:

   See "Connecting the C Series Controllers to External Devices" on page 36.

6. Connect the AC power cord or DC power cables.
   - Connecting Power to an AC-Powered C3000 or C5000 Controller on page 33
   - Connecting Power to a DC-Powered C3000 or C5000 Controller on page 34
7. Power on the controller.

   See "Powering On the C Series C3000 or C5000 Controller" on page 38.

8. Perform the initial system configuration.

See "Performing the Initial Software Configuration for the C Series Controller" on page 39.

CHAPTER 5

Unpacking the C Series Controller

Unpacking the C Series Controller

Before you begin unpacking the item, be sure you have the following tools:

- No. 2 Phillips screwdriver
- Utility knife
- Mechanical lift, or at least one person to assist in lifting

The system is shipped in a cardboard carton and secured with foam packing material. The carton also contains an accessory box and quick start instructions.

NOTE: **The controller is maximally protected inside the shipping carton. Do not unpack it until you are ready to begin installation.**

WARNING: **Three people are required to install the system in a rack: two to lift it into position and one to screw it to the rack.**

To unpack the controller:

1. Move the shipping carton to a staging area as close to the installation site as possible, but where you have enough room to remove the controller.
2. Position the carton so that the arrows are pointing up.
3. Open the top flaps on the shipping carton.
4. Remove the accessory box, and verify the contents against the parts inventory on the label attached to the carton.
5. Pull out the packing material holding the controller in place.

6. Verify the contents of the carton against the packing list included with the controller.
7. Save the shipping carton and packing materials in case you later need to move or ship the controller.

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- Verifying the C Series Controller Parts Received on page 26

Verifying the C Series Controller Parts Received

A packing list is included in each shipment. Check the parts in the shipment against the items on the packing list. The packing list specifies the part numbers and descriptions of each part in your order.

If any part is missing, contact a Juniper Networks customer service representative.

A fully configured controller contains the controller chassis with installed components, listed in Table 10 on page 26, and an accessory box, which contains the parts listed in Table 11 on page 26. The parts shipped with your controller can vary depending on the configuration you ordered.

Table 10: Parts List for a Fully Configured C Series Controller

Component	Quantity
Chassis	1
Power supplies	2
Fan modules	3
Hard disks	4
Quick start installation instructions	1
Blank panels for slots without components installed	One blank panel for each slot not occupied by a component

Table 11: Accessory Box Parts List for a C Series Controller

Component	Quantity
Shipping label 4” x 6”	1
ESD bag	1
Cable, DB9 to RJ45 Adapter, 7 ft., straight through	1
Cable, Ethernet, OSC-ETH-7-BL, 7 ft. Blue	1

Table 11: Accessory Box Parts List for a C Series Controller *(continued)*

Component	Quantity
Power cord (for your region)	2

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- Unpacking the C Series Controller on page 25

CHAPTER 6

Installing the C3000 and C5000 Controller

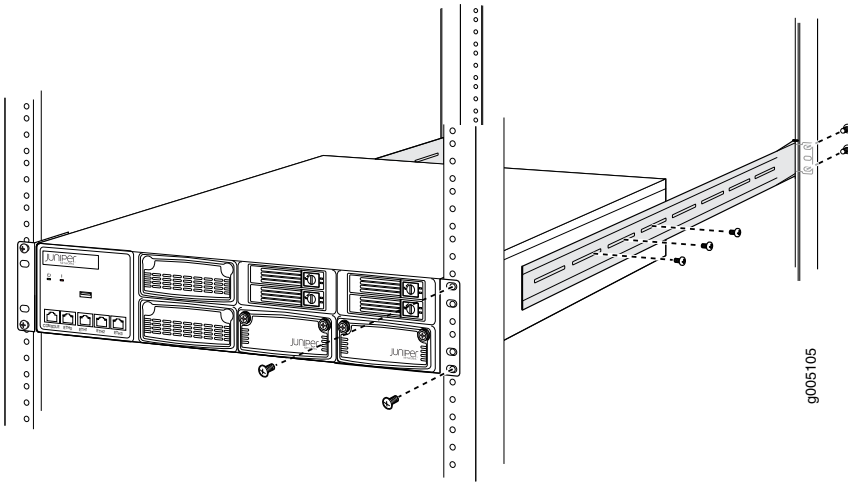
Installing the C Series Controller in a Four-Post Rack

The C3000 and C5000 Controllers require additional support when mounted on the rack-mount system. This option is the default configuration.

To install the mounting hardware for a four-post rack:

1. Insert four rack-mount screws on each side of the system to secure the front of the chassis to the equipment rack.
2. Slide the rear-mount rail brackets into the backs of the front rails on either side of the chassis, and align the brackets with your rear equipment rack posts. Secure the rear-mount rail brackets to your equipment rack with two rack mount screws each.
3. Insert locking screws on the sides of the rear-mount brackets to secure the front and rear mounting brackets in place. See Figure 11 on page 30.
4. Verify that the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and that the appliance is level.

Figure 11: Installing the C Series Controller in a Four-Post Rack



Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Controller Rack Requirements on page 20
- C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance on page 22
- C3000 and C5000 Installation Summary on page 23

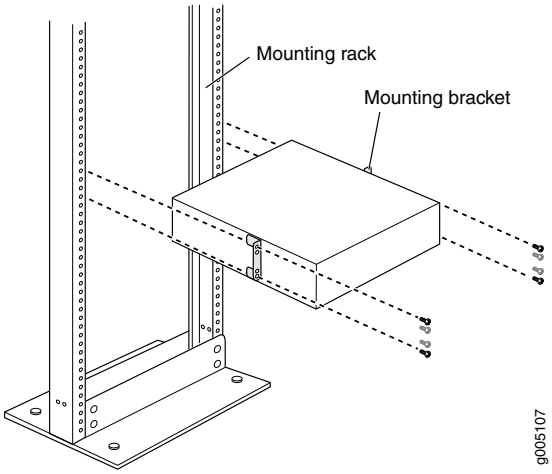
Installing the C Series Controller in a Two-Post Rack

To install the C Series Controller in a two-post rack, you must attach the mounting hardware for center mounting. Center mounting allows the controller to be midmounted so that there is even clearance on the front and rear of the rack.

To mount the controller using the center-mount option:

1. Remove the two front-mount rails from either side of the chassis.
2. Insert one midmount bracket to the center on either side of the chassis.
3. Attach the chassis to the equipment rack, and insert the other two midmount brackets on either side of the system to secure the chassis to the backs of the post (see Figure 12 on page 31).
4. Verify that the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and that the appliance is level.

Figure 12: Installing the C Series Controller in a Two-Post Rack



Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Controller Rack Requirements on page 20
- C3000 and C5000 Clearance Requirements for Airflow and Hardware Maintenance on page 22
- C3000 and C5000 Installation Summary on page 23

CHAPTER 7

Connecting the C3000 and C5000 Controller

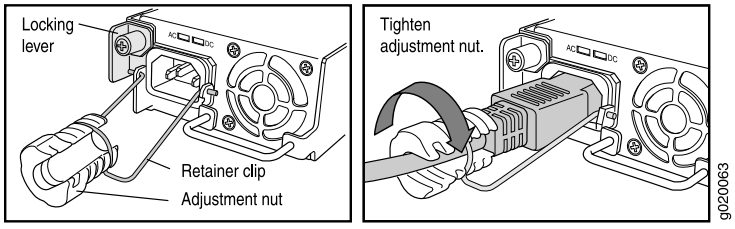
Connecting Power to an AC-Powered C3000 or C5000 Controller

NOTE: C3000 and C5000 Controllers now ship with a retainer clip for the power cord. The retainer clip prevents accidental disconnection of the power cord by securing the cord to the chassis. Steps 1 and 3 apply only to appliances equipped with retainer clips.

To connect AC power to a C3000 or C5000 Controller (see: Figure 13 on page 33)

1. Squeeze the two sides of the power cord retainer clip and insert the L-shaped ends of the wire clip into the holes in the bracket on each side of the AC appliance inlet.

Figure 13: Connecting Power on an AC-Powered C3000 or C5000 Controller



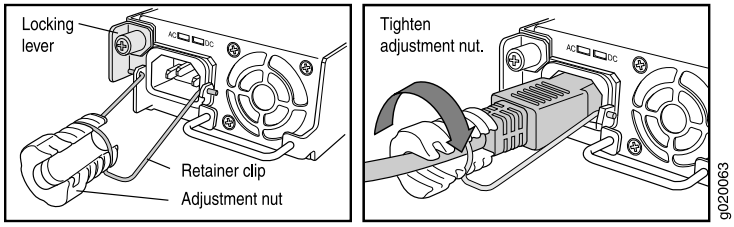
2. Insert the coupler end of the power cord into the AC appliance inlet.

   If your controller contains two power supplies, plug each power cord into a separate power circuit to ensure that the device continues to receive power if one of the power circuits fails.

3. Push the power cord into the slot in the adjustment nut of the power cord retainer clip. Turn the nut until it is snug against the base of the coupler and the slot in the nut is turned 90° from the top of the switch.

NOTE: We suggest that you use an uninterruptible power supply (UPS) with your C Series Controller.

NOTE: To provide redundancy, do not terminate Power A and Power B leads at the same power source.



Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- AC Power Electrical Specifications for the C Series Controller on page 77
- C3000 and C5000 AC Power Cord Specifications on page 78

Connecting Power to a DC-Powered C3000 or C5000 Controller

On a DC-powered controller, the DC power cables from the external DC power sources connect to the field-wiring terminals on each power supply.

Connect DC power to the controller by inserting power cables into the field-wiring terminals on the faceplate of each power supply. DC power cables and lugs are not supplied with the device. For more information about the required cable type, see "DC Power Cable Specifications for C Series Controllers" on page 79.

CAUTION: There is no standard color coding for DC power cables. The color coding used by the external DC power source at your site determines the color coding for the leads on the DC power cables that attach to the terminal studs on the power supply faceplate. You must ensure that power connections maintain the proper polarity. The power source cables might be labeled (+) and (–) to indicate their polarity.

To connect DC power to a C3000 or C5000 Controller (see Figure 14 on page 36):

1. Verify that there is no power flowing from either external power source, so that the voltage across the leads of the DC power cables is 0 V. Ensure that there is no chance that the cable leads might become active during the procedure.
2. Remove the clear plastic shield covering the field-wiring terminals on the power supply.
3. Remove the screws on the field-wiring and ground terminal.
4. Verify that a licensed electrician has attached a listed DC power cable lug to each power source cable and ground cable.

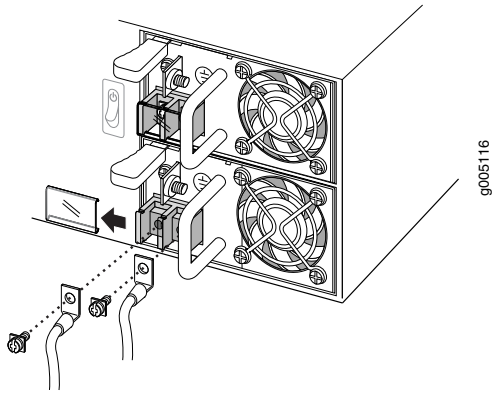
   NOTE: **You must bend the cable lug that attaches to the DC power source cable at a 90° angle in order to properly install the clear plastic shield covering.**

5. Insert the DC power and ground cable lugs into the appropriate terminals. Using a number 1 Phillips screwdriver, turn the screw on each terminal clockwise to secure the cable. Apply 8.68 lb-in. (.98 Nm) of torque to each screw.
   a. Insert the positive (+) source cable into the return terminal, which is labeled **RTN**.
   b. Insert the negative (–) source cable into the input terminal, which is labeled **–48V**.
   c. Align the ground cable with the ground terminal.

   CAUTION: **Ensure that each cable lug seats flush against the surface of the terminal block as you tighten the screws.**

6. Verify that the DC source power and grounding cables are correct, that they are not touching or blocking access to controller components, and that they do not drape where people could trip on them.
7. Replace the clear plastic shield over the field-wiring terminals.
8. Turn on the current from the power source so that voltage flows to the controller.

Figure 14: Connecting DC Power Cables to the Controller



Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- DC Power Electrical Specifications for the C Series Controller on page 79

Connecting the C Series Controllers to External Devices

- Connecting the C Series Controller to a Network for Out-of-Band Management on page 36
- Connecting the C Series Controller to a Management Console on page 37

Connecting the C Series Controller to a Network for Out-of-Band Management

To connect the C Series Controller to a network for out-of-band management, connect an Ethernet cable with RJ-45 connectors to one of the Ethernet ports on the front panel. One Ethernet cable is provided with the controller.

To connect to the Ethernet port on the front panel to a network:

1. Turn off the power to the management device.
2. Plug one end of the Ethernet cable (Figure 15 on page 36 shows the connector) into one of the Ethernet ports on the front panel. Figure 16 on page 37 shows the port. Plug the other end of the cable into the network device.

Figure 15: Ethernet Cable Connector

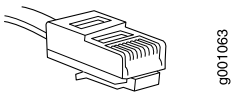
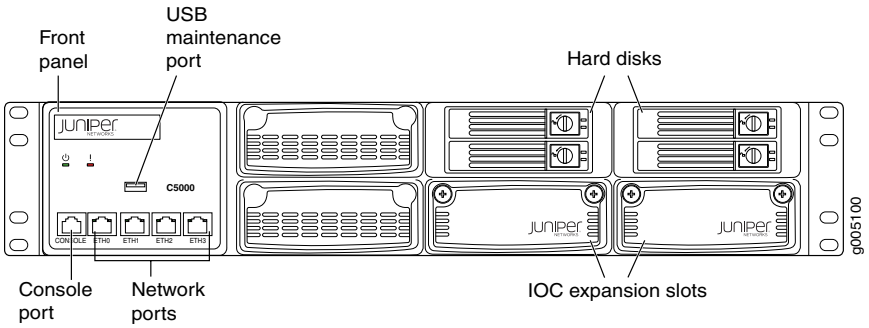


Figure 16: Network Ports Location



Connecting the C Series Controller to a Management Console

Before powering on the system, you must set up a management console. The console enables you to communicate with your system during the power-on process and to manage your system using the command-line interface (CLI).

When connecting a console directly to the system, use a cable appropriate to your terminal connector. The cable must have a female DB-9 connector to attach to the RS-232 port on the system.

To connect the C3000 or C5000 Controller to a management console:

1. Turn off the power to the console.
2. Plug the RJ-45 end of the serial cable (Figure 17 on page 37 shows the connector) into the port labeled **CONSOLE** on the front panel. Figure 18 on page 37 shows the location of the port on the front panel.
3. Plug the female DB-9 end into the device's serial port.

Figure 17: Console Cable Connector

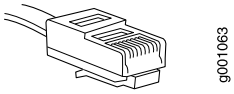
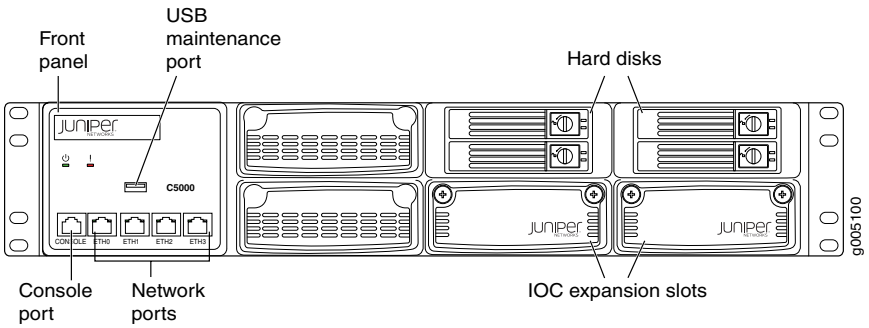


Figure 18: Console Port Location



Powering On the C Series C3000 or C5000 Controller

CAUTION: Evaluate the overall loading of the branch circuit before you install any equipment into a rack.

To power on the system:

1. Verify that the power source is operational and turned on.
2. Inspect all power connections to the system.
3. Confirm that all connections are secure.
4. Push the momentary power switch on the rear panel.

   The green status LED on the power supply turns on.
5. Monitor the LEDs to verify that the system is booting properly.

   When the prompt appears on the system console, you can log in and configure the system.

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- AC Power Electrical Specifications for the C Series Controller on page 77
- DC Power Electrical Specifications for the C Series Controller on page 79

CHAPTER 8

Initially Configuring the C Series Controller

C Series Configuration Overview

After powering on the system, perform the following tasks required to get the controller ready to work with:

1. Connect a management console to the system, configure it, and log in.

   See "Setting Up Management Access and Logging In" on page 40.

2. Configure the Juniper Networks Database.

   See "Configuring the Juniper Networks Database" on page 41.

3. Configure hostname and domain information.

   See "Configuring Hostname and Domain Parameters" on page 41.

4. Configure the system for remote access.

   See "Configuring the System for Remote Access" on page 42.

5. Configure the system to accept SSH and Telnet connections.

   See "Configuring the System to Accept SSH and Telnet Connections" on page 43.

6. Add an Admin user account.

   See "Adding an Admin User Account" on page 43.

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23

Performing the Initial Software Configuration for the C Series Controller

Setting Up Management Access and Logging In

Before you power on the system, you must set up a management console. (See "Connecting the C Series Controllers to External Devices" on page 36.)

You can monitor and manage the system through either of these methods:

- Console terminal—Connect a console (PC, Macintosh, or UNIX workstation) directly to the system's RS-232 serial port.
- Remote console—Connect a 10/100Base-T port (**ETH0**) to an Ethernet network, and run SSH or Telnet from a remote console.

For initial access to the system, you need to physically connect your console directly to the system's RS-232 port. Through this connection you use the SRC command-line interface (CLI) to set the hostname and domain information. You can then access the system remotely (for example, by means of SSH).

To communicate with the system, you must have a terminal emulation program running on your PC or Macintosh. You can use any terminal emulation program, such as HyperTerminal. A UNIX workstation can use the emulator TIP.

To log in to the system:

1. Start your terminal emulation program using the following settings:
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: none
2. Enter the username.

   ```
   SRC Release 4.0 [V.4.0.0.R-1]
   localhost login:root
   ```

3. Enter the password.

   ```
   Password:password
   ```

   You are now logged in as root user.

4. To access the CLI, enter the **cli** command.

   ```
   [root@localhost ~]# cli

   --- SRC CLI 4.0 build CLI.R.4.0.0.001
   (c) 2005-2009 Juniper Networks Inc.
   root@localhost>
   ```


Configuring the Juniper Networks Database

Each C Series Controller contains a Juniper Networks database. The database stores SRC data, sample data, configuration information, and user profiles. You must enable the Juniper Networks database the first time you power on the system. It can operate as a standalone database or as a member of a community of Juniper Networks databases.

NOTE: **The Juniper Networks database must be running before you start configuring the SRC software.**

Typically, you run the database in standalone mode only in testing environments. In standalone mode, the database does not communicate with other Juniper Networks databases; there is no data distribution and no redundancy. In community mode, databases distribute data changes among specified databases. When you have two or more C Series Controllers, enable the Juniper Networks database to run in community mode, and assign a role to each database:

- Primary role—A database that provides read and write access to client applications. It replicates its data and distributes changes to any Juniper Networks databases configured as neighbors.
- Secondary role—A database that provides read access to client applications. If client applications try to write data to this database, the database refers the client to a primary database.

In the following example, a standalone database is enabled.

To enable a Juniper Networks database to run in standalone mode:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database.

   root@host# edit system ldap server

2. Enable standalone mode.

   [edit system ldap server]
   root@host# set stand-alone

Configuring Hostname and Domain Parameters

To set hostname and domain parameters:

1. Enter configuration mode.

   root@host> edit

2. Configure the hostname.

   [edit]
   root@host# set system host-name *host-name*

   For example:

```
[edit]
root@host# set system host-name my-hostname
```

3. Configure either a list of domain names to search, or create the domain name. We recommend configuring a list of domain names to search.

   To configure a list of domain names to search:

   ```
   [edit]
   root@host# set system domain-search [domain-name1, domain-name2, ...]
   ```

   For example:

   ```
   [edit]
   root@host# set system domain-search [my-domain.juniper.net domain.juniper2.net]
   ```

   To configure the domain name:

   ```
   [edit]
   root@host# set system domain-name domain-name
   ```

   For example:

   ```
   [edit]
   root@host# set system domain-name my-domain.juniper.net
   ```

Configuring the System for Remote Access

To allow remote access to the system, you must configure the generic interfaces. You can specify an IP address with mask or a broadcast address with mask for an interface. For more information, see *C Series Controller Remote Access*.

To configure the generic interfaces:

1. From configuration mode, access the configuration statement that configures the interface.

   ```
   root@host# edit interfaces eth0
   ```

2. Specify the unit, family, and IP address for the interface.

   ```
   [edit interfaces eth0]
   root@host# set unit number family inet address address
   ```

   For example, to configure an interface with only an IP address:

   ```
   [edit interfaces eth0]
   root@host# set unit 0 family inet address 192.2.0.10/24
   ```

3. (Optional) Specify the broadcast address for the interface.

   ```
   [edit interfaces eth0]
   root@host# set unit number family inet broadcast broadcast
   ```

   For example, to configure an interface with only a broadcast address:

   ```
   [edit interfaces eth0]
   root@host# set unit 0 family inet broadcast 192.2.0.255
   ```

4. Verify the interface configuration.

   ```
   [edit interfaces eth0]
   ```

```
root@host# show
unit 0 {
family {
   inet {
      broadcast 192.2.0.255;
   }
}
}
```

Configuring the System to Accept SSH and Telnet Connections

You can enable SSH and Telnet to let users who have the appropriate privileges connect to the system. For security reasons, we recommend that you do not allow remote users to access the CLI as **root**. The system does not allow **root** access over a Telnet connection. For more information, see *Configuring a C Series Controller to Accept SSH Connections (SRC CLI)*.

To configure the system to accept SSH connections:

1. From configuration mode, access the **[edit system services ssh]** hierarchy level.
2. (Optional) Specify whether or not to allow root login through SSH.

   ```
   [edit system services ssh]
   root@host> set root-login (allow | deny | deny-password)
   ```

   where:

   - **allow**— Allow users to log in to the C Series Controller as **root** through SSH.
   - **deny**— Disable users from logging in to the system as **root** through SSH.
   - **deny-password**— Allow users to log in to the system as root through SSH when the authentication method (for example, RSA authentication) does not require a password. (Default)

To configure the system to accept Telnet connections:

- In edit mode, type the following command.

  ```
  [edit]
  root@host# set system services telnet
  ```

Adding an Admin User Account

Although you use **root** access for initial configuration of the system, you use user accounts to enter commands and statements at the CLI. Therefore, you must set up an admin account to allow further configuration. You can use a built-in class, such as super-user.

To configure an account for an administrative user:

1. Create an account for an administrative user.

   ```
   [edit]
   root@host# edit system login user user
   ```

   For example:

```
[edit]
root@host# edit system login user myadmin
```

2. Set the class for the administrative user to the login class that you created.

```
[edit system login user myadmin]
root@host# set class class
```

For example:

```
[edit system login user myadmin]
root@host# set class super-user
```

3. Specify the name of the administrative user.

```
[edit system login user myadmin]
root@host# set full-name “John Doe”
```

4. Set the CLI editing level to expert.

```
[edit system login user myadmin]
root@host# set level expert
```

5. (Optional) Specify that a space be used for command completion.

```
[edit system login user myadmin]
root@host# set complete-on-space on
```

6. Verify that the configuration for the administrative user is correct.

```
[edit system login user myadmin]
root@host# show
class super-user;
full-name "John Doe";
uid 506;
gid 100;
level expert;
complete-on-space on;
```

7. Set the password of the user.

```
[edit]
root@host#edit system login user myadmin authentication
[edit system login user myadmin authentication]
root@host# set plain-text-password
```

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Installation Summary on page 23
- C Series Configuration Overview on page 39

PART 3

Hardware Maintenance and Replacement Procedures

CHAPTER 9

Maintaining C3000 and C5000 Controller Hardware Components

Storing C Series Modules and Components

Retain the packaging in which a component was shipped, and use this packaging to store the item.

CAUTION: **Failure to store electronic components correctly can lead to damage of these items.**

Follow these guidelines for storing components:

- Store each component in a separate antistatic bag.
- Store components in an antistatic plastic container. Some of these containers can accommodate several components in separate compartments.
- Do not store multiple components in an antistatic bag or container where they can touch other items.
- (Optional) Store the item in its antistatic bag or container within the protective packaging or padded box that the item was shipped in.

Related Documentation

- Cleaning C Series Components Overview on page 47
- Maintaining the C Series Hard Disks on page 48

Cleaning C Series Components Overview

Clean the system with a dry cloth every few weeks to prevent excessive dust accumulation. This cleaning helps to maintain the efficiency of the cooling system and to prevent damage to electronic components.

WARNING: Do not insert any metal object, such as a screwdriver, or place your hand into an open slot when the system is on. Remove jewelry (including rings, necklaces, and watches) before working on equipment that is connected to power lines. These actions prevent electric shock and serious burns.

CAUTION: When cleaning the system, wear an antistatic device. This action helps to protect components from damage by electrostatic discharge.

Related Documentation

- Storing C Series Modules and Components on page 47
- Maintaining the C Series Hard Disks on page 48

Maintaining the C Series Hard Disks

Purpose For optimum controller performance, verify the condition of the hard disks.

Action On a regular basis:

- Check the hard disk status LEDs to view information about the status of the hard disk.
- To check the status of the hard disk, issue the **show disk status** command. The output is similar to the following:

```
user@host> show disk status
------------------------------------------------------------------------
Controller information
------------------------------------------------------------------------
  Controller type                         : SAS1068E
  BIOS version                            : 6.26.00.00
  Firmware version                        : 1.27.00.00
  Channel description                     : 1 Serial Attached SCSI
  Initiator ID                            : 112
  Maximum physical devices                : 62
  Concurrent commands supported           : 277
  Slot                                    : 57
  Bus                                     : 5
  Device                                  : 0
  Function                                : 0
  RAID Support                            : Yes
------------------------------------------------------------------------
IR Volume information
------------------------------------------------------------------------
IR volume 1
  Volume ID                               : 16
  Status of volume                        : Okay (OKY)
  RAID level                              : 1E
  Size (in MB)                            : 278472
  Physical hard disks (Target ID)         : 20 17 18 19
------------------------------------------------------------------------
Physical device information
------------------------------------------------------------------------
Initiator at ID #112
Target on ID #17
```

```
  Device is a Hard disk
  Enclosure #                          : 1
  Slot #                               : 1
  Connector ID                         : 1
  Target ID                            : 17
  State                                : Online (ONL)
  Size (in MB)/(in sectors)            : 140014/286749488
  Manufacturer                         : SEAGATE
  Model Number                         : ST9146852SS
  Firmware Revision                    : 0005
  Serial No                            : 6TB0094A00009037Q6C1
  Drive Type                           : SAS
  Protocol                             : SAS
Target on ID #18
  Device is a Hard disk
  Enclosure #                          : 1
  Slot #                               : 2
  Connector ID                         : 2
  Target ID                            : 18
  State                                : Online (ONL)
  Size (in MB)/(in sectors)            : 140014/286749488
  Manufacturer                         : SEAGATE
  Model Number                         : ST9146852SS
  Firmware Revision                    : 0005
  Serial No                            : 6TB007E000009038UBWS
  Drive Type                           : SAS
  Protocol                             : SAS
Target on ID #19
  Device is a Hard disk
  Enclosure #                          : 1
  Slot #                               : 3
  Connector ID                         : 3
  Target ID                            : 19
  State                                : Online (ONL)
  Size (in MB)/(in sectors)            : 140014/286749488
  Manufacturer                         : SEAGATE
  Model Number                         : ST9146852SS
  Firmware Revision                    : 0005
  Serial No                            : 6TB0093R00009038UAV8
  Drive Type                           : SAS
  Protocol                             : SAS
Target on ID #20
  Device is a Hard disk
  Enclosure #                          : 1
  Slot #                               : 0
  Connector ID                         : 0
  Target ID                            : 20
  State                                : Online (ONL)
  Size (in MB)/(in sectors)            : 140014/286749488
  Manufacturer                         : SEAGATE
  Model Number                         : ST9146852SS
  Firmware Revision                    : 0005
  Serial No                            : 6TB008W200009038UAVT
  Drive Type                           : SAS
  Protocol                             : SAS
------------------------------------------------------------------------
Enclosure information
------------------------------------------------------------------------
Enclosure#                             : 1
  Logical ID                           : 000368d4:500e0810
  Numslots                             : 8
```

```
  StartSlot                             : 0
  Start TargetID                        : 0
  Start Bus                             : 0
------------------------------------------------------------------------
IR Volume 1
  Volume ID                             : 16
  Current operation                     : None
  Volume status                         : Enabled
  Volume state                          : Optimal
  Physical disk I/Os                    : Not quiesced
```

Related Documentation

- Storing C Series Modules and Components on page 47
- Cleaning C Series Components Overview on page 47

CHAPTER 10

Replacing C3000 and C5000 Controller Hardware Components

Tools and Parts Required to Replace C Series Components

You need the following tools and parts to replace components:

- Flathead and Phillips screwdrivers
- Insulated adjustable wrench
- Antistatic wrist strap
- Antistatic bags (or other protective packaging to hold components)
- Plastic boots or other protective covers for fiber-optic connectors

Related Documentation

- Replacing a C3000 or C5000 Fan Module on page 51
- Replacing a C3000 or C5000 Hard Disk on page 53
- Replacing a C3000 or C5000 Power Supply on page 55

Replacing a C3000 or C5000 Fan Module

Removing a C3000 or C5000 Fan Module

C3000 and C5000 Controllers have three fan modules located on the rear of the chassis. The fan module is a hot-removable and hot-insertable field replaceable unit (FRU): You can remove and replace it without powering off the controller or disrupting controller functions.

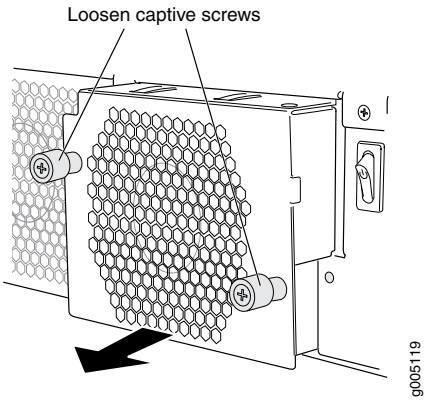
Ensure that you have the following parts and tools available:

- A Phillips (+) screwdriver, number 2

To remove a fan module from a C3000 or C5000 Controller (see Figure 19 on page 52):

1. Loosen the captive screws on either side of the fan module.
2. Grasp the captive screws and slide the fan module out of the chassis.

Figure 19: Removing a C3000 or C5000 Fan Module



Installing a C3000 or C5000 Fan Module

C3000 and C5000 Controllers have three fan modules located on the rear of the chassis. The fan module is a hot-removable and hot-insertable field replaceable unit (FRU): You can remove and replace it without powering off the controller or disrupting controller functions.

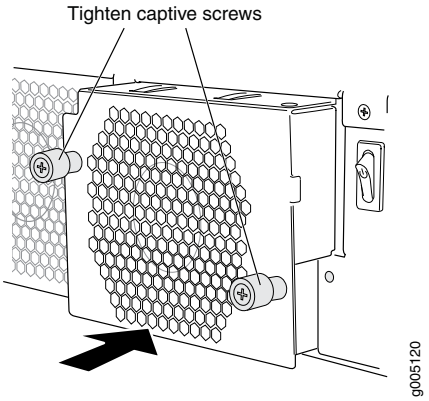
Ensure that you have the following parts and tools available:

- A Phillips (+) screwdriver, number 2

To install the fan module in a C3000 or C5000 Controller (see Figure 20 on page 53):

1. Remove the fan module from its bag.
2. Using both hands, align the fan module with the guides on the fan module slot on the rear panel of the chassis.
3. Slide the fan module into the fan module slot until it is firmly seated.
4. Tighten both captive screws to secure the fan.

Figure 20: Installing a C3000 or C5000 Fan Module



Related Documentation

- C3000 and C5000 Fan Module Description on page 12
- C Series Fan Module Serial Number Label on page 84

Replacing a C3000 or C5000 Hard Disk

- Removing a C3000 or C5000 Hard Disk on page 53
- Installing a C3000 or C5000 Hard Disk on page 54

Removing a C3000 or C5000 Hard Disk

C3000 and C5000 Controllers have four hard disk arrays located in two slots on the front of the chassis. The hard disk is a hot-removable and hot-insertable field replaceable unit (FRU): You can remove and replace it without powering off the controller or disrupting controller functions.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- An antistatic bag or an antistatic mat

To remove a hard disk on a C3000 or C5000 Controller (see Figure 21 on page 54):

1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. From the CLI, disable the disk. The hard disks are numbered 0 through 3.

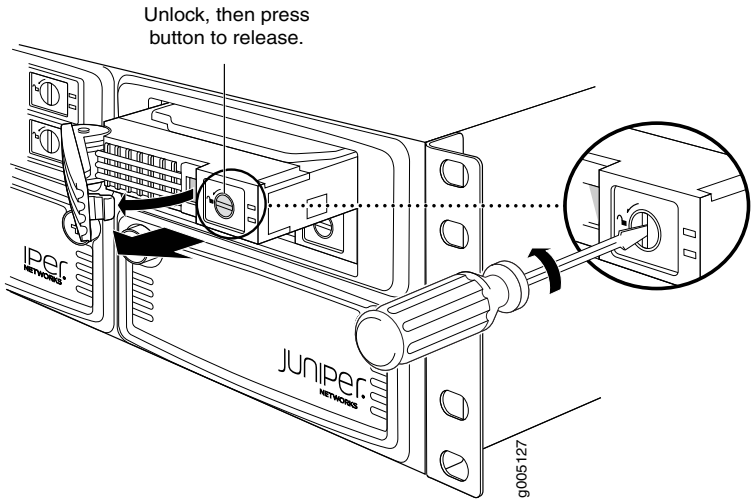
   user@host> **request disk disable device *device-number***

   NOTE: **Do not power off the C Series Controller when you are swapping a disk, because doing so might result in initialization errors.**

3. Using a flat screwdriver, turn the screw to the unlocked position so that the notch in the screw is oriented horizontally.

4. Push the screw knob in so that the ejector handle is released.
5. Gently pull the ejector handle toward you, and slide the hard disk out of the hard disk slot. Keep one hand underneath the hard disk to support it while removing it from the chassis.

Figure 21: Removing a C3000 or C5000 Hard Disk



Installing a C3000 or C5000 Hard Disk

C3000 and C5000 Controllers have four hard disk arrays located in two bays on the front of the chassis. The hard disk is a hot-removable and hot-insertable field replaceable unit (FRU): You can remove and replace it without powering off the controller or disrupting controller functions.

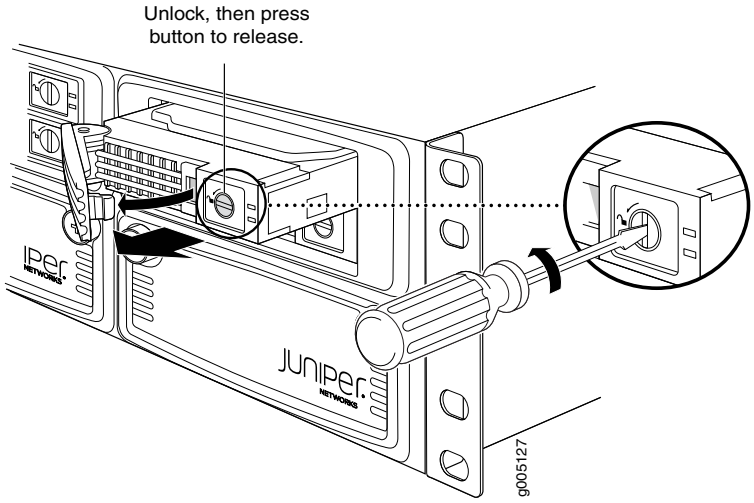
To replace a hard disk on a C3000 or C5000 Controller (see Figure 22 on page 55):

1. Slide the hard disk into the bay.
2. Push the ejector lever so that the latch closes and the hard disk secures firmly in place.
3. Using a flat screwdriver, turn the screw to the locked position so that the notch in the screw is oriented vertically.
4. From the CLI, enable the disk. The hard disks are numbered 0 through 3.

   user@host> **request disk enable device *device-number***
5. Verify that the disk is initialized.

   user@host> **show disk status**

Figure 22: Installing a C3000 or C5000 Hard Disk



Related Documentation

- C3000 and C5000 Hard Disk Description on page 13
- Maintaining the C Series Hard Disks on page 48
- C Series Hard Disk Serial Number Label on page 85

Replacing a C3000 or C5000 Power Supply

- Removing a C3000 or C5000 Power Supply on page 55
- Installing a C3000 or C5000 Power Supply on page 57

Removing a C3000 or C5000 Power Supply

The power supply in a C3000 or C5000 Controller is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the far right side of the rear panel: Two power supplies can be installed in a C3000 or C5000 Controller. You can remove and replace a single power supply without powering off the controller or disrupting external controller functions.

Ensure that you have the following parts and tools available to remove a power supply from a C3000 or C5000 Controller.

- Replacement power supply or blank cover for the power supply slot

To remove a power supply on a C3000 or C5000 Controller (see Figure 23 on page 56 and Figure 24 on page 56):

1. Remove the power cord or power cable as described in "Disconnecting a C3000 or C5000 AC Power Cord" on page 58 or "Disconnecting a C3000 or C5000 DC Power Cable" on page 59.

2. Push the power supply faceplate latch to the right while pulling the power supply away from the controller to release the latch. Stop pulling the power supply after the latch has been released.
3. Taking care not to touch power supply components, pins, leads, or solder connections, place one hand under the power supply to support it. Grasp the power supply handle with your other hand and, pull the power supply completely out of the chassis.

Figure 23: Removing a C3000 or C5000 AC Power Supply

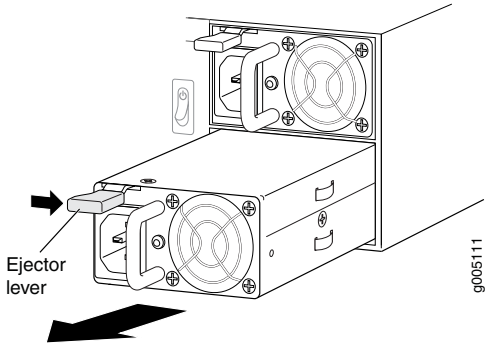
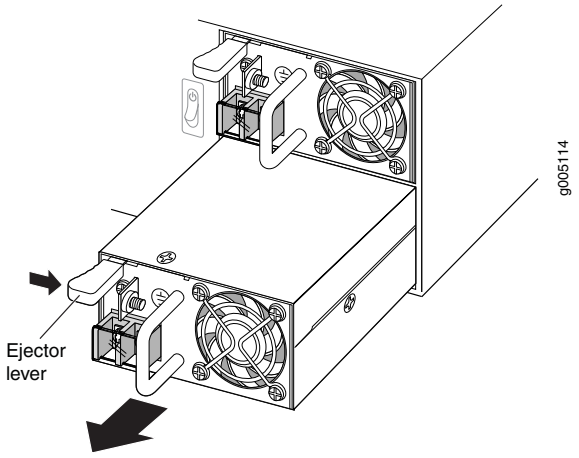


Figure 24: Removing a C3000 or C5000 DC Power Supply



Installing a C3000 or C5000 Power Supply

The AC power supply in a C3000 or C5000 Controller is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the far right side of the rear panel: Two AC power supplies can be installed in a C3000 or C5000 Controller. You can remove and replace a single AC power supply without powering off the controller or disrupting external controller functions.

To install a power supply on a C3000 or C5000 Controller (see Figure 25 on page 57 and Figure 26 on page 58):

1. Taking care not to touch power supply components, pins, leads, or solder connections, remove the power supply from its bag.
2. Using one hand on the faceplate handle and the other hand on the bottom of the power supply to support its weight, slide the power supply straight into the power supply slot until the power supply is approximately halfway to the back of the controller.
3. Remove the hand supporting the bottom of the power supply.
4. Gently slide the power supply straight into the chassis until the power supply is almost fully seated in the slot. The power supply will reach a point where backpressure will prevent the power supply from pushing forward; do not force the power supply fully into the slot at this point of the procedure.
5. Use your thumb to move the latch at the top of the power supply faceplate to the right, and push the power supply flush into the back of the chassis. Release the latch.
6. Using a flat screwdriver, turn the screw to the locked position so that the notch in the screw is oriented vertically.

Figure 25: Installing a C3000 or C5000 AC Power Supply

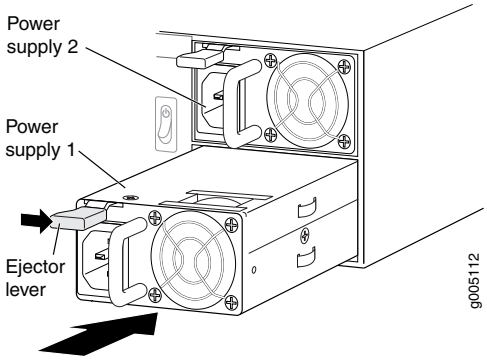
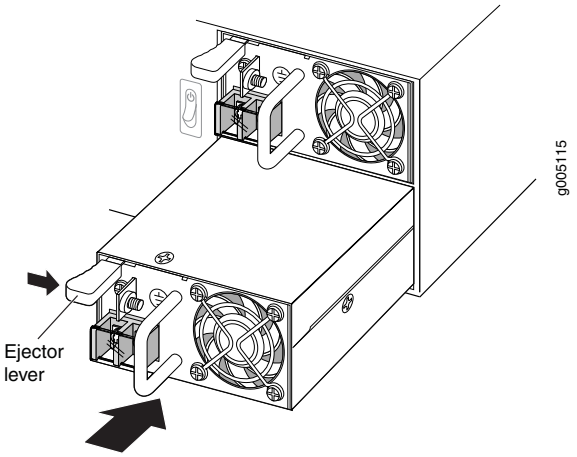


Figure 26: Installing a C3000 or C5000 DC Power Supply



Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Replacing a C3000 or C5000 AC Power Cord on page 58
- Replacing a C3000 or C5000 DC Power Cable on page 59
- C Series Power Supply Serial Number Label on page 85

Replacing a C3000 or C5000 AC Power Cord

- Disconnecting a C3000 or C5000 AC Power Cord on page 58
- Connecting a C3000 or C5000 AC Power Cord on page 58

Disconnecting a C3000 or C5000 AC Power Cord

To disconnect the AC power cord:

1. Unplug the power cord from the power source receptacle.
2. Unplug the power cord from the appliance inlet on the power supply.

Connecting a C3000 or C5000 AC Power Cord

To connect the AC power cord:

1. Locate a replacement power cord with the type of plug appropriate to your geographical location (see "C3000 and C5000 AC Power Cord Specifications" on page 78).
2. Plug the replacement power cord into the corresponding appliance inlet located in the chassis directly above the power supply.
3. Insert the power cord plug into an external AC power source receptacle.

NOTE: Each power supply must be connected to a dedicated AC power feed and a dedicated customer site circuit breaker. We recommend that you use a 5 A (110 VAC) minimum, or as required by local code.

4. Dress the power cord appropriately. Verify that the power cord does not block the air exhaust and access to router components, or drape where people could trip on it.
5. Observe the status LEDs on the power supply faceplate. If the power supply is correctly installed and functioning normally, the status LED lights green steadily.

Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Replacing a C3000 or C5000 Power Supply on page 55
- C Series Power Supply Serial Number Label on page 85

Replacing a C3000 or C5000 DC Power Cable

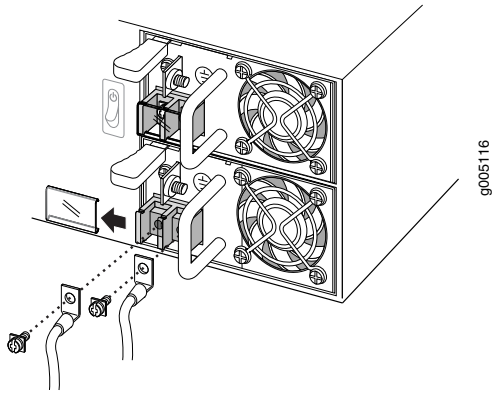
- Disconnecting a C3000 or C5000 DC Power Cable on page 59
- Connecting a C3000 or C5000 DC Power Cable on page 60

Disconnecting a C3000 or C5000 DC Power Cable

To disconnect a power cable for a DC power supply (see Figure 27 on page 60):

1. Switch off the dedicated customer site circuit breaker for the power supply being removed.
2. Make sure that the voltage across the DC power source cable leads is 0 V and that there is no chance that the cables might become active during the removal process.
3. Verify that the status LED on the power supply is not lit.
4. Remove the power cable from the external DC power source.
5. Remove the clear plastic shield covering the field-wiring terminals on the power supply.
6. Remove the screws on the field-wiring and ground terminal.
7. Carefully move the power cables out of the way.

Figure 27: Disconnecting a C3000 or C5000 DC Power Cable



Connecting a C3000 or C5000 DC Power Cable

WARNING: Before performing DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off position, and tape the switch handle of the circuit breaker in the off position.

To connect a power cable for a DC power supply:

1. Locate a replacement power cable.
2. Verify that a licensed electrician has attached a cable lug to the replacement power cable.

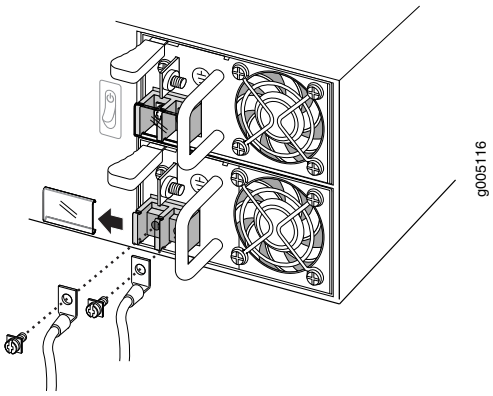
   NOTE: You must bend the cable lug that attaches to the DC power source cable at a 90° angle in order to properly install the clear plastic shield covering.

3. Verify that the status LED is off.
4. Insert the DC power and ground cable lugs into the appropriate terminals. Using a number 1 Phillips screwdriver, turn the screw on each terminal clockwise to secure the cable. Apply 8.68 lb-in. (.98 Nm) of torque to each screw.
   a. Insert the positive (+) source cable into the return terminal, which is labeled **RTN**.
   b. Insert the negative (–) source cable into the input terminal, which is labeled **–48V**.
   c. Align the ground cable with the ground terminal.

CAUTION: Ensure that each cable lug seats flush against the surface of the terminal block as you tighten the screws.

5. Verify that the DC source power and grounding cables are correct, that they are not touching or blocking access to controller components, and that they do not drape where people could trip on them.
6. Replace the clear plastic shield over the field-wiring terminals.
7. Attach the power cable to the DC power source.
8. Turn on the dedicated customer site circuit breaker to the power supply.
9. Verify that the status LED on the power supply is lit steadily. If the power supply is correctly installed and functioning normally, the status LED lights green steadily.

Figure 28: Connecting a C3000 or C5000 DC Power Cable



Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Replacing a C3000 or C5000 Power Supply on page 55
- C Series Power Supply Serial Number Label on page 85

PART 4

Appendixes

APPENDIX A

Safety and Regulatory Compliance Information for the C3000 and C5000 Controllers

C3000 and C5000 Safety Notices

Lithium Battery

WARNING: There is a danger of explosion if the battery is incorrectly replaced. Return the device to the manufacturer for battery replacement. Moreover, never open the chassis under any circumstances. Doing so will also void the warranty.

WARNING: La batterie présente un risque d'explosion si elle n'est pas remplacée comme il se doit. Retournez l'appareil au fabricant pour faire remplacer la batterie. Le châssis ne doit par ailleurs en aucun cas être ouvert. Cela annulerait la garantie.

Power Disconnection

WARNING: Before working on a device that has an On/Off switch, turn the power off and disconnect the power cord to all power supplies.

For DC power supplies, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the off position, and tape the switch handle of the circuit breaker in the off position.

WARNING: Avant de commencer à travailler sur un appareil muni d'un interrupteur On. Off (Marche/Arrêt), Coupez l'alimentation et débranchez le cordon d'alimentation de toute source d'alimentation.

Dans le cas d'une alimentation à courant continu, repérez le disjoncteur sur le tableau de contrôle qui alimente le circuit c.c., placez-le en position d'off (arrêt) et maintenez le bouton du disjoncteur en position d'arrêt à l'aide de ruban adhésif.

Power Cable Warning

WARNING: This unit has two power cables. To avoid electric shock, disconnect both power cables before servicing the unit.

WARNING: Cette unité possède deux cordons d'alimentation. Pour supprimer tout risque électrique, débranchez les deux cordons d'alimentation de l'unité.

Power Cable Warning (Japanese)

WARNING: The attached power cable is only for this product. Do not use the cable for another product.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

g017253

Working with Lasers

Some Juniper Networks devices are equipped with fiber-optic ports, which emit radiation that may be harmful to the human eye. Fiber-optic ports are considered Class 1 laser or Class 1 LED ports.

WARNING: Class 1 Laser product.

WARNING: Class 1 LED product.

WARNING: Do not stare into the laser beam or view it directly with optical instruments.

To avoid exposure to radiation, do not stare into the aperture of a fiber-optic port. Invisible radiation might be emitted from the aperture of the port when no fiber cable is connected.

These products have been tested and found to comply with Class 1 limits of IEC 60825-1, IEC 60825-2, EN 60825-1, EN 60825-2, and 21CFR1040.

VCCI Compliance

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures. (VCCI-A)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Related Documentation

- C3000 and C5000 General Safety Guidelines on page 67

C3000 and C5000 General Safety Guidelines

For your safety, before installing the system, review all safety warnings in this topic.

WARNING: The recommended maximum ambient temperature is 104ºF (40ºC). For safe operation take into consideration the internal temperature within the rack.

WARNING: Install equipment in the rack from the bottom upward. Doing this helps maintain the stability of the rack and reduces the chance of the rack tipping over.

WARNING: Do not insert any metal object, such as a screwdriver, into the system. Doing so can cause electric shock and serious burns.

WARNING: Three people are required to install the system in a rack: two to lift the system into position and one to screw it to the rack.

WARNING: Connect the system or rack to ground (earth), and ensure that a reliable grounding path is maintained in the rack.

WARNING: Do not work on the system or connect or disconnect cables during lightning activity.

WARNING: Be sure that circuit breakers for the power source are in the OFF position before attaching power cables.

WARNING: Before servicing the system, turn off the power.

WARNING: Remove jewelry (including rings, necklaces, and watches) before working on equipment that is connected to power lines. Metal objects heat up when connected to power and ground and can cause serious burns or become welded to the terminals.

CAUTION: Evaluate the overall loading of the branch circuit before you install any equipment into a rack.

Related Documentation

- C3000 and C5000 Safety Notices on page 65

C3000 and C5000 Safety and Emissions Certifications

The C3000 and C5000 Controllers have the following safety certifications:

- CAN/CSA-C22.2 No 60950-1:2003
- UL60950
- EN60950-1:2001+A11
- IEC 60950-1:2001

The C3000 and C5000 Controllers have the following emissions certifications:

- FCC Class A
- EN 55022 Class A
- EN 55024 Immunity
- EN 61000-3-2
- VCCI Class A

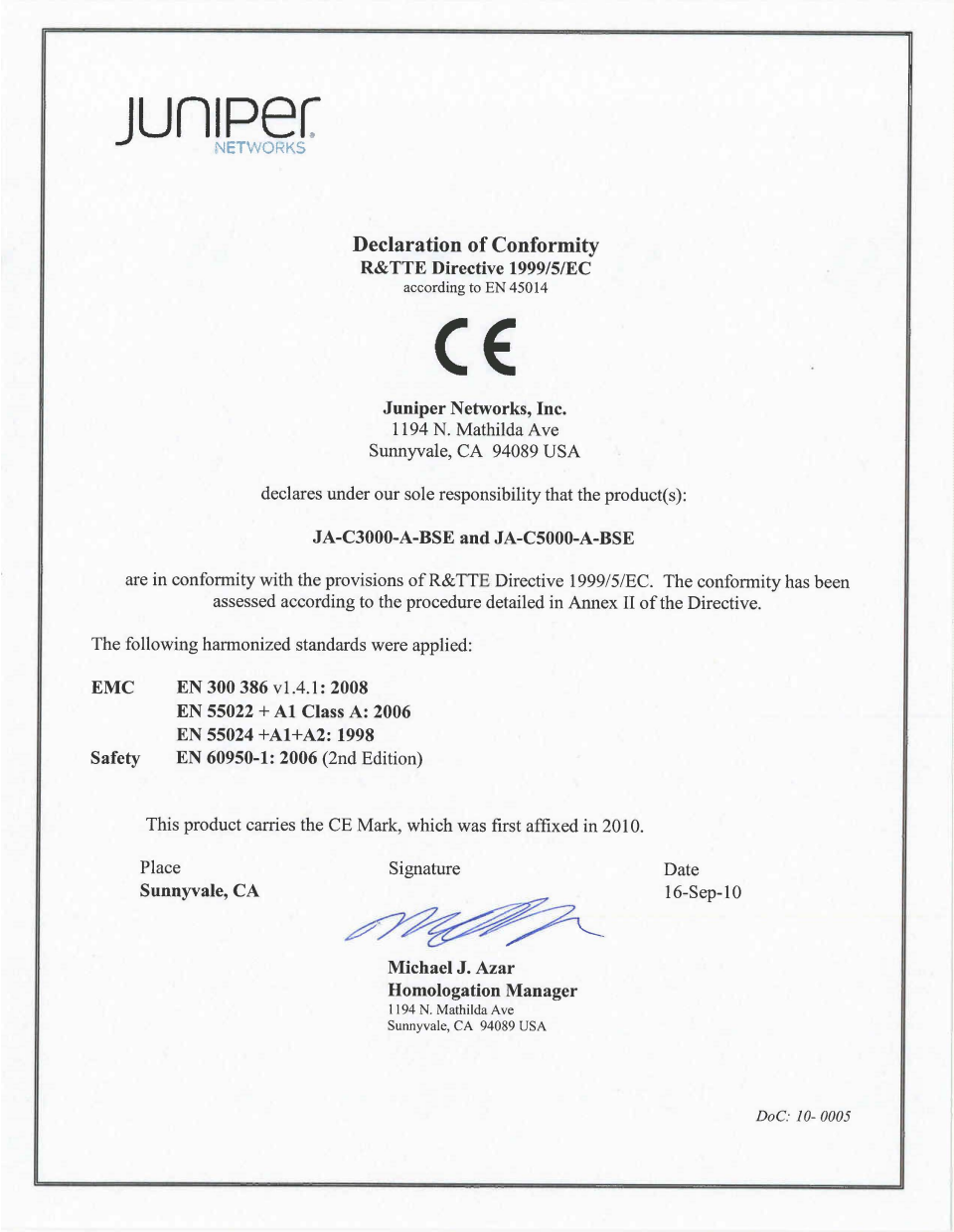
Related Documentation

- C3000 and C5000 Safety Notices on page 65
- C3000 and C5000 General Safety Guidelines on page 67

Declaration of Conformity for the C3000 and C5000 Controllers

Figure 29 on page 70 shows the Declaration of Conformity for the controller.

Figure 29: C3000 and C5000 Controllers Declaration of Conformity



JUNIPER NETWORKS

Declaration of Conformity
R&TTE Directive 1999/5/EC
according to EN 45014

CE

Juniper Networks, Inc.
1194 N. Mathilda Ave
Sunnyvale, CA 94089 USA

declares under our sole responsibility that the product(s):

JA-C3000-A-BSE and JA-C5000-A-BSE

are in conformity with the provisions of R&TTE Directive 1999/5/EC. The conformity has been assessed according to the procedure detailed in Annex II of the Directive.

The following harmonized standards were applied:

EMC	**EN 300 386** v1.4.1**: 2008**
	EN 55022 + **A1 Class A: 2006**
	EN 55024 +**A1**+**A2: 1998**
Safety	**EN 60950-1: 2006** (2nd Edition)

This product carries the CE Mark, which was first affixed in 2010.

Place	Signature	Date
Sunnyvale, CA		16-Sep-10

Michael J. Azar
Homologation Manager
1194 N. Mathilda Ave
Sunnyvale, CA 94089 USA

DoC: 10- 0005

C3000 and C5000 Cabling Recommendations

Comply with the following recommendations:

- Use only shielded cables.
- Ensure that cable distance and rate limits meet IEEE-recommended maximum distances and speeds for signaling purposes. For information about attenuation and power loss in optical fiber cables see:

  - ANSI T1.646a-1997 Telecommunications – Broadband ISDN - Physical Layer Specification for User-Network Interfaces Including DS1/ATM (1997)
  - ANSI T1.646-1995 Telecommunications – Broadband ISDN - Physical Layer Specification for User-Network Interfaces Including DS1/ATM (1995)
- Ensure that power cables deliver sufficient power to the system.
- Attach laser fiber connectors only to Class 1 laser devices in accordance with IEC 60825-1, Safety of Laser Products - Part 1.
- Route cables so that they do not restrict ventilation or airflow.
- Route cables so that modules and field-replaceable units are easily accessible.
- Route cables in a logical direction to prevent loss of connectivity to other equipment in the rack, to associated equipment in adjacent racks, or to the backbone network.

For additional cable recommendations, consult the document GR-63–CORE: Network Equipment Building System (NEBS) Requirements: Physical Protection, Issue 2, April 2002.

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19

APPENDIX B

C3000 and C5000 Controller Physical Specifications

C3000 and C5000 Controller Physical Specifications

Table 12 on page 73 summarizes the physical specifications for the chassis.

Table 12: C3000 and C5000 Controller Physical Specifications

Description	Weight	Width	Depth	Height
Chassis dimension	43.31 lb (19.65 kg)	17.26 in. (43.7 cm)	23.5 in. (59.7 cm)	3.5 in. (8.8 cm)
Hard Disk	0.6 lb (265 g)	2.9 in. (7.4 cm)	4.9 in. (12.5 cm)	0.6 in. (1.5 cm)
Fan module	0.6 lb (300 g)	4.3 in. (11 cm)	1.63 in. (4.13 cm)	3.25 in. (8.25 cm)
DC power supply	2.6 lb (1.2 kg)	3 in. (7.62 cm)	12 in. (30.48 cm)	1.56 in. (3.96 cm)
AC power supply	2.6 lb (1.2 kg)	3 in. (7.62 cm)	12 in. (30.48 cm)	1.56 in. (3.96 cm)

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- C3000 and C5000 Controller Environmental Specifications on page 75

APPENDIX C

C3000 and C5000 Controller Environmental Specifications

C3000 and C5000 Controller Environmental Specifications

Table 13 on page 75 indicates the environmental specifications required for normal controller operation. In addition, the site should be as dust-free as possible.

Table 13: C3000 and C5000 Controller Environmental Specifications

Description	Value
Altitude	No performance degradation to 10,000 ft (3048 m)
Relative humidity	Normal operation ensured in relative humidity range of 5% to 95%, noncondensing
Temperature	Normal operation ensured in temperature range of 41ºF (5ºC) to 104ºF (40ºC) Nonoperating storage temperature in shipping container: –40ºF (–40ºC) to 158ºF (70ºC) 1909 BTU/hour (560 W)

NOTE: Install the controller only in restricted areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.

Related Documentation

- C3000 and C5000 Site Preparation Checklist on page 19
- Cleaning C Series Components Overview on page 47
- C3000 and C5000 Controller Physical Specifications on page 73

APPENDIX D

Power Guidelines, Requirements, and Specifications for the C3000 and C5000 Controller

C3000 and C5000 AC Power Specifications and Requirements

AC Power Electrical Specifications for the C Series Controller

Table 14 on page 77 lists the AC power supply electrical specifications.

Table 14: AC Power Electrical Specifications

Item	Specification
AC power supply output power	560 W
AC system input power	350 W
AC input voltage	Operating range: 100 to 240 VAC
AC input line frequency	50 to 60 Hz (nominal)
AC system current rating	5A @ 110 VAC
Efficiency	80% minimum at full load

Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Connecting Power to an AC-Powered C3000 or C5000 Controller on page 33
- C3000 and C5000 AC Power Cord Specifications on page 78

C3000 and C5000 AC Power Cord Specifications

Each AC power supply has a single AC appliance inlet located on the power supply that requires a dedicated AC power feed. Most sites distribute power through a main conduit that leads to frame-mounted power distribution panels, one of which can be located at the top of the rack that houses the controller. An AC power cord connects each power supply to the power distribution panel.

The controller ships with detachable AC power cords, each approximately 8 ft (2.5 m) long that supply AC power to the controller. The C13 appliance coupler at the female end of the cord inserts into the AC appliance inlet coupler, type C14 (right angle) as described by International Electrotechnical Commission (IEC) standard 60320. The plug at the male end of the power cord fits into the power source receptacle that is standard for your geographical location. Table 15 on page 78 provides specifications for the AC power cord provided for each country or region.

Table 15: AC Power Cord Specifications

Country	Model Number	Electrical Specification	Plug Type
Australia	CBL-GP-JX-PWR-AU	250 VAC, 10 A, 50 Hz	AS/NZ 3112–1993
China	CBL-GP-JX-PWR-CH	250 VAC, 10 A, 50 Hz	GB2099.1 1996 and GB1002 1996 (CH1-10P)
Europe (except Italy and United Kingdom)	CBL-GP-JX-PWR-EU	250 VAC, 10 A, 50 Hz	CEE (7) VII
Italy	CBL-GP-JX-PWR-IT	250 VAC, 10 A, 50 Hz	IEC60884-1
Japan	CBL-GP-JX-PWR-JP	125 VAC, 12 A, 50 Hz or 60 Hz	JIS 8303 and 8306
Korea	CBL-GP-JX-PWR-KR	250 VAC, 10 A, 50 Hz	KSC8305 and EN 60320 C13
North America	CBL-GP-JX-PWR-US	125 VAC, 10 A, 60 Hz	NEWA 5-15P
Switzerland	CBL-GP-JX-PWR-SZ	250 VAC, 10 A, 50 Hz	SEV 1011,1991, and EN 60320 C13
United Kingdom	CBL-GP-JX-PWR-UK	250 VAC, 10 A, 50 Hz	BS1363

WARNING: **The AC power cord for the controller is intended for use with the controller only and not for any other use.**

Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Connecting Power to an AC-Powered C3000 or C5000 Controller on page 33
- AC Power Electrical Specifications for the C Series Controller on page 77

C3000 and C5000 DC Power Specifications and Requirements

DC Power Electrical Specifications for the C Series Controller

Table 16 on page 79 lists the DC power electrical specifications.

Table 16: DC Power Electrical Specifications

Item	Specification
Maximum power supply output power	560 W
DC system input power	350 W
DC input voltage	–38 VDC to –72 VDC
DC input current rating	10 A @ –48 VDC
Efficiency	80% minimum at full load

Related Documentation

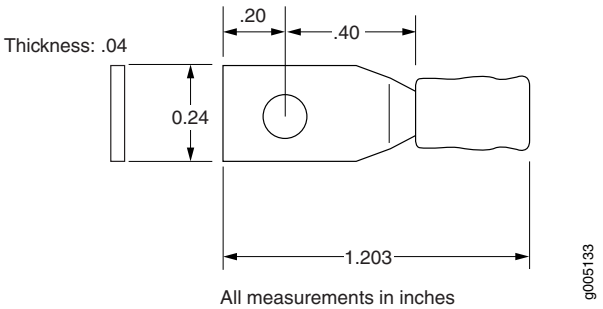
- C3000 and C5000 Power Supply Description on page 10
- Connecting a C3000 or C5000 DC Power Cable on page 60
- DC Power Cable Specifications for C Series Controllers on page 79

DC Power Cable Specifications for C Series Controllers

DC Power Cable Lug Specifications

To connect the DC power cables to the controller, you must use cable lugs that have the specifications shown in Figure 30 on page 79.

Figure 30: DC Power Cable Lug



CAUTION: Before you install a C Series Controller, a licensed electrician must attach a cable lug to the power cables. A cable with an incorrectly attached lug can damage the controller.

DC Power Cable Specifications

You must use DC power cables that meet the following specifications: 14-12 AWG (1.9 mm^2 minimum) wire, or as required by the local code.

Related Documentation

- C3000 and C5000 Power Supply Description on page 10
- Connecting a C3000 or C5000 DC Power Cable on page 60
- DC Power Electrical Specifications for the C Series Controller on page 79

APPENDIX E

C3000 and C5000 Controller Cable Connector Pinouts

C3000 and C5000 RJ-45 Console Connector Pinouts

Table 17 on page 81 shows the pinouts for the RJ-45 console connector pinouts.

Table 17: RJ-45 Console Connector Pinouts

Pin	Signal	Description
1	RTS output	Request to send
2	DTR output	Data terminal ready
3	TxD output	Transmit data
4	GND	Chassis ground
5	GND	Chassis ground
6	RxD input	Receive data
7	DSR Input	Data set ready
8	CTS Input	Clear to send

Related Documentation

- Connecting the C Series Controllers to External Devices on page 36

APPENDIX F

Contacting Customer Support and Returning C3000 and C5000 Hardware

Locating C Series Component Serial Numbers

Displaying C Series Component Serial Numbers

Before contacting Juniper Networks to request a Return Materials Authorization (RMA), you must find the serial number on the chassis or component. To list all the chassis components and their serial numbers, enter the following command:

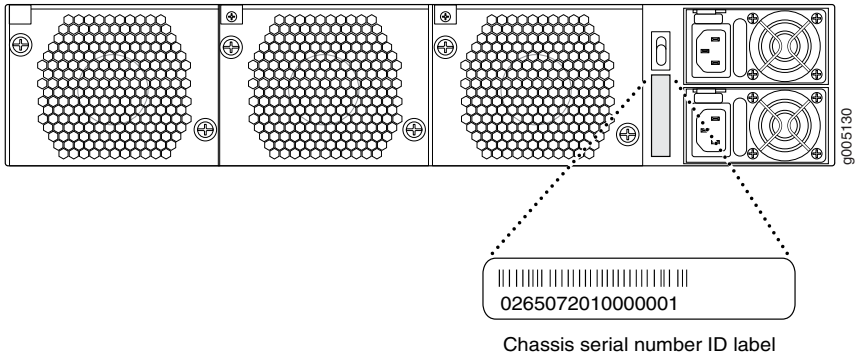
```
user@host> show system information
```

You can also find the serial numbers on the components.

C Series Chassis Serial Number Label

The chassis serial number is located on the rear of the chassis (see Figure 31 on page 84).

Figure 31: C Series Chassis Serial Number Label



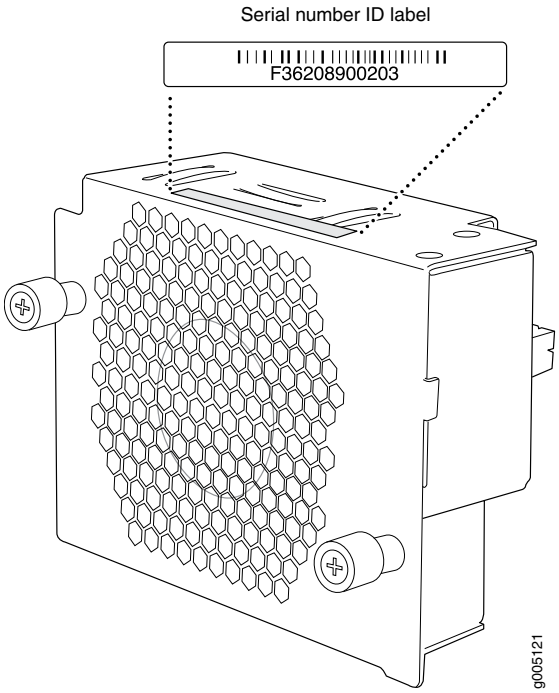
Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

C Series Fan Module Serial Number Label

For replacement fan modules only, the serial number is located on the top of the fan module (see Figure 32 on page 84).

Figure 32: C Series Fan Module Serial Number Label



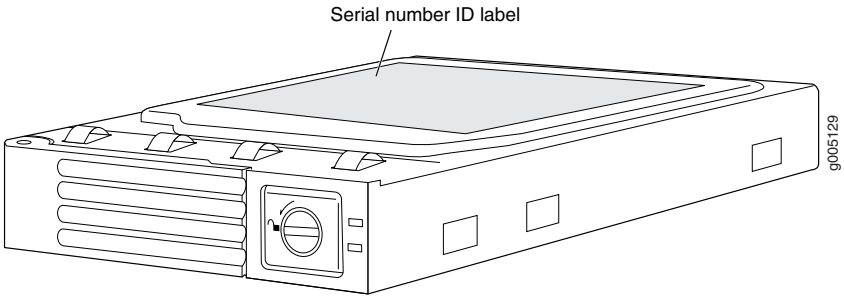
Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

C Series Hard Disk Serial Number Label

The hard disk serial number is located on the top of the hard disk (see Figure 33 on page 85).

Figure 33: C Series Hard Disk Serial Number Label



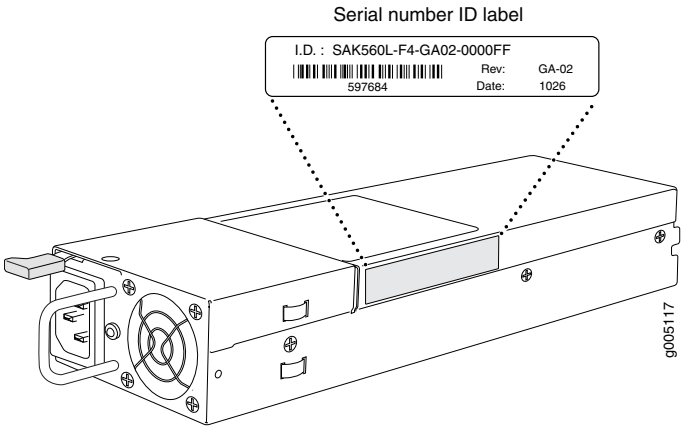
Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

C Series Power Supply Serial Number Label

The power supply serial number is located on the side of the power supply (see Figure 34 on page 86).

Figure 34: C Series Power Supply Serial Number Label



Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

Contacting Customer Support

You can contact Juniper Networks Technical Assistance Center (JTAC) 24 hours a day, 7 days a week in one of the following ways:

- On the Web, using the Case Manager link at:

  http://www.juniper.net/support/

- By telephone:

  From the US and Canada: 1-888-314-JTAC

  From all other locations: 1-408-745-9500

  If contacting JTAC by phone, enter your 11-digit case number followed by the # key if this is an existing case, or press the * key to be routed to the next available support engineer.

When requesting support from JTAC by telephone, be prepared to provide the following information:

- Your existing case number, if you have one
- Details of the failure or problem
- Type of activity being performed on the controller when the problem occurred
- Configuration data using one or more of the **show** commands

Related Documentation

- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

Returning a Hardware Component to Juniper Networks, Inc.

If a problem cannot be resolved by the JTAC technician, a Return Materials Authorization (RMA) is issued. This number is used to track the returned material at the factory and to return repaired or new components to the customer as needed.

NOTE: **Do not return any component to Juniper Networks, Inc. unless you have first obtained an RMA number. Juniper Networks, Inc. reserves the right to refuse shipments that do not have an RMA. Refused shipments will be returned to the customer via collect freight.**

For more information about return and repair policies, see the customer support Web page at http://www.juniper.net/support/guidelines.html.

For product problems or technical support issues, contact the Juniper Networks Technical Assistance Center (JTAC) using the Case Manager link at http://www.juniper.net/support/ or at 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).

To return a hardware component:

1. Determine the part number and serial number of the component.
2. Obtain an RMA number from the Juniper Networks Technical Assistance Center (JTAC). You can send e-mail or telephone as described above.
3. Provide the following information in your e-mail message or during the telephone call:
   - Part number and serial number of component
   - Your name, organization name, telephone number, and fax number
   - Description of the failure
4. The support representative validates your request and issues an RMA number for return of the component.
5. Pack the chassis or component for shipment.

Related Documentation

- Contacting Customer Support on page 86
- Packing the C Series Controller for Shipment on page 88
- Guidelines for Packing C Series Components for Shipment on page 89

Packing the C Series Controller for Shipment

To pack the chassis for shipment:

1. Ground yourself by using an antistatic wrist strap or other device.
2. Retrieve the shipping box and packing materials in which the controller was originally shipped. If you do not have these materials, contact your Juniper Networks representative about approved packaging materials.
3. On the console or other management device connected to the controller, enter CLI operational mode and issue the **request system halt** command to halt your system.

   ```
   user@host> request system halt
   ```

   Wait until a message appears on the console confirming that the operating system has halted.

   For more information about the command, see the *SRC PE CLI Command Reference*.
4. Shut down power to the controller by holding down the power input switch.
5. Disconnect power from the controller.
6. Remove the cables that connect to all external devices.
7. Remove all field-replaceable units (FRUs) from the controller.
8. Remove the controller from the rack. One person should grasp the controller while a second person unscrews and removes the mounting screws from the rack. One lifter can then move the controller to the shipping container.
9. Place the controller in the shipping container.
10. Cover the controller with an ESD bag, and place the packing foam on top of and around the controller.
11. Replace the accessory box on top of the packing foam.
12. Securely tape the box closed.
13. Write the RMA number on the exterior of the box to ensure proper tracking.

Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Guidelines for Packing C Series Components for Shipment on page 89

Guidelines for Packing C Series Components for Shipment

To pack and ship individual components:

- When you return components, make sure they are adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Use the original shipping materials if they are available.
- Place individual components in electrostatic bags.
- Write the RMA number on the exterior of the box to ensure proper tracking.

CAUTION: **Do not stack any of the controller components.**

Related Documentation

- Contacting Customer Support on page 86
- Returning a Hardware Component to Juniper Networks, Inc. on page 87
- Packing the C Series Controller for Shipment on page 88

PART 5

Index

Index