



## **C Series Controllers**

# **C2000 and C4000 Hardware Guide**

*Release 4.0.x*

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## SRC Documentation and Release Notes

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

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

## Audience

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This documentation is intended for experienced system and network specialists working with routers running JUNOS® 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

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Table 1 on page xiv defines the notice icons used in this guide. Table 2 on page xiv 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
<b>Bold text like this</b>	<ul style="list-style-type: none"> <li>■ Represents keywords, scripts, and tools in text.</li> <li>■ Represents a GUI element that the user selects, clicks, checks, or clears.</li> </ul>	<ul style="list-style-type: none"> <li>■ Specify the keyword <b>exp-msg</b>.</li> <li>■ Run the <b>install.sh</b> script.</li> <li>■ Use the <b>pkgadd</b> tool.</li> <li>■ To cancel the configuration, click <b>Cancel</b>.</li> </ul>
<b>Bold text like this</b>	Represents text that the user must type.	user@host# <b>set cache-entry-age</b> cache-entry-age
<b>Fixed-width text like this</b>	Represents information as displayed on your terminal's screen, such as CLI commands in output displays.	<pre>nic-locators {   login {     resolution {       resolver-name /realms/       login/A1;       key-type LoginName;       value-type SaeId;     }   } }</pre>
Regular sans serif typeface	<ul style="list-style-type: none"> <li>■ Represents configuration statements.</li> <li>■ Indicates SRC CLI commands and options in text.</li> <li>■ Represents examples in procedures.</li> <li>■ Represents URLs.</li> </ul>	<ul style="list-style-type: none"> <li>■ system ldap server{ stand-alone;</li> <li>■ Use the request sae modify device failover command with the force option</li> <li>■ user@host# . . .</li> <li>■ <a href="http://www.juniper.net/techpubs/software/management/src/api-index.html">http://www.juniper.net/techpubs/software/management/src/api-index.html</a></li> </ul>
<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	user@host# <b>set local-address</b> 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.
<i>Italic typeface</i>	<ul style="list-style-type: none"> <li>■ Emphasizes words.</li> <li>■ Identifies book names.</li> <li>■ Identifies distinguished names.</li> <li>■ Identifies files, directories, and paths in text but not in command examples.</li> </ul>	<ul style="list-style-type: none"> <li>■ There are two levels of access: <i>user</i> and <i>privileged</i>.</li> <li>■ <i>SRC PE Getting Started Guide</i></li> <li>■ <i>o = Users, o = UMC</i></li> <li>■ The <i>/etc/default.properties</i> file.</li> </ul>
Backslash	At the end of a line, indicates that the text wraps to the next line.	Plugin.radiusAcct-1.class = \net.juniper.srmt.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

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- 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**

# **Product Overview**

- C Series Controller Overview on page 3



## Chapter 1

# C Series Controller Overview

This chapter provides introductory information about the C Series Controller. Topics include:

- System Description on page 3
- C Series Controller Models on page 3
- C Series Model Components on page 5
- Network Management Tools on page 6

## System Description

---

The C Series Controller enables you to easily install, configure, and support Juniper Networks Session and Resource Control-Policy Engine (SRC PE) 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 C2000 model and the C4000 model. Each model is composed of two hard drives, fans, redundant power supplies, two USB ports, a console management port, and four Ethernet ports. The main difference between the two models is the number of service session licenses and concurrent subscribers allowed on each unit.

## C Series Controller Models

---

Two C Series Controller models are available:

- C2000
- C4000

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
C2000	200,000

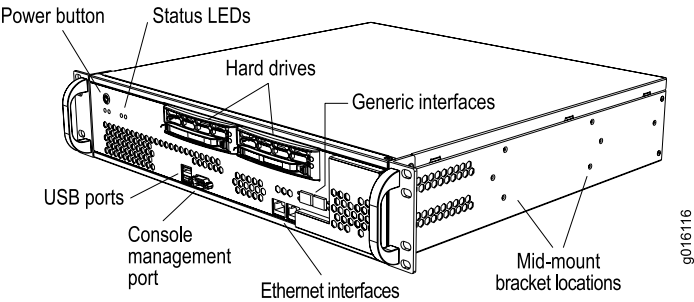
**Table 3: C Series Model Differences** *(continued)*

Model	Concurrent Subscribers
C4000	400,000

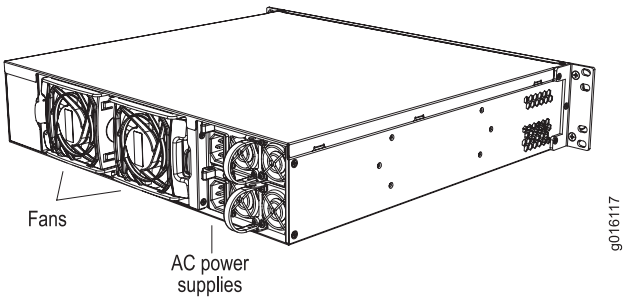


**NOTE:** The models illustrated in this book might look different from your model because of configuration variations.

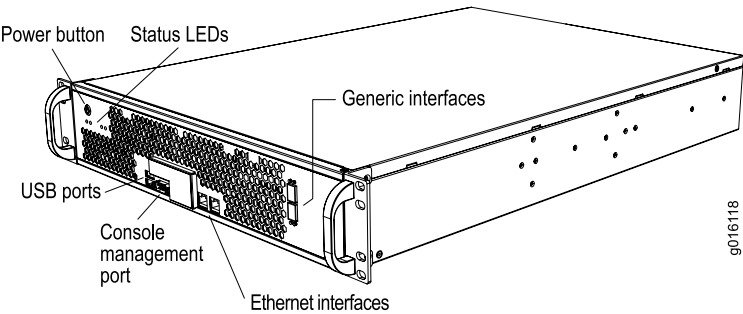
**Figure 1: C2000, Front View**

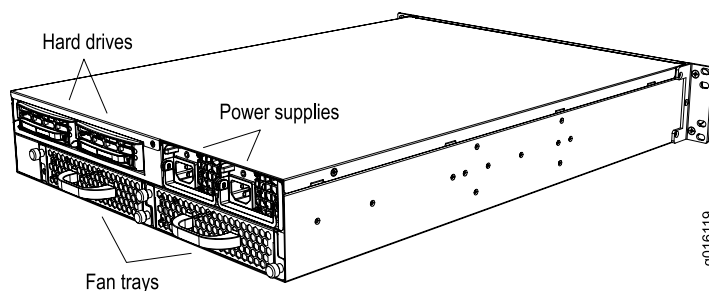


**Figure 2: C2000, Rear View**



**Figure 3: C4000, Front View**



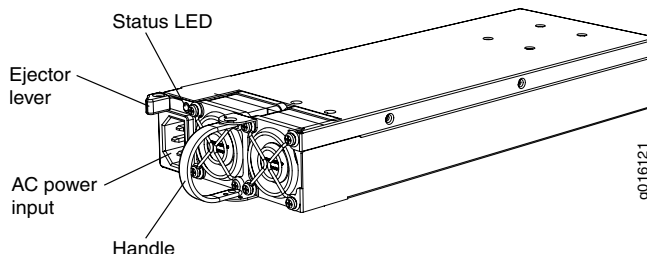
**Figure 4: C4000, Rear View**

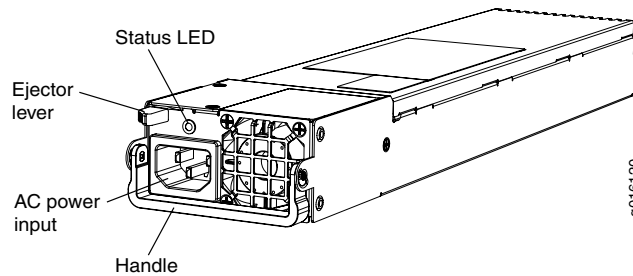
## C Series Model Components

The C2000 model and C4000 model contain the following components:

- Internal memory
- CPU
- Hard drive—Each model has two hot-swappable, redundant drives in a redundant array of independent disks (RAID) 1 (mirror) configuration. The C2000 model has two hard drives located in the front, and the C4000 model has two hard drives located in the rear.
- Fans—The C2000 model has two hot-swappable fans located in the rear. The C4000 model has two hot-swappable fan trays located in the rear. Each fan tray contains three fans.
- Power supply—Each model has two hot-swappable, redundant AC-power supplies located in the rear. Depending on the model, each power supply module has either two (C2000 model) or one (C4000 model) associated fan.

Optional DC power supplies are also available for both the C2000 and C4000. The DC power supplies are field-replaceable units (FRUs) that can be replaced at the customer site.

**Figure 5: C2000 Power Supply**

**Figure 6: C4000 Power Supply**

- 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 two ports that can be used for memory storage devices.
- Ethernet interfaces—Each model has two 10/100/1000Base-T Ethernet ports (ETH0 and ETH1) that accept an RJ-45 (male) connector, providing an out-of-band connection for LAN access through a Telnet session, SSH, or SNMP. ETH0 provides access from a network that is behind a firewall. ETH1 provides access for applications on an external network, such as the Internet.
- Generic interfaces—Each model has two generic ports (ETH2 and ETH3) that enable you to use standard connectors, such as small form-factor pluggable transceivers (SFPs), to create fiber-optic or Gigabit Ethernet connections and provide additional LAN connectivity. The following SFPs are available:
  - 1000Base-SX—Duplex LC connector, multimode, rated for 500 m over 10-micron core cable, 850-nm laser transmitter
  - 1000Base-LX—Duplex LC connector, single-mode, rated for 10 m over 10-micron core cable, 1310-nm laser transmitter
  - 1000Base-T—RJ-45 connector, rated for up to 100 m on CAT5 cable
- Status LEDs—Each model has LEDs that provide information about hard drive, power supply, and interface status.
- USB storage device—Contains the latest system software, including the operating system for the C Series Controller. The device is read-only and should be used to recover from a major software failure. See the *SRC Release Notes* for more information about recovering from a software failure.
- Rack-mount and rail kit.

## Network Management Tools

---

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

### 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 *SRC PE Monitoring and Troubleshooting Guide*.





## **Part 2**

# **Initial Installation**

- Unpacking and Inspecting the C Series Controller on page 11
- Installing and Cabling the C Series Controller on page 13
- Powering Up the C Series Controller on page 19
- Setting the Initial Configuration on page 21



## Chapter 2

# Unpacking and Inspecting the C Series Controller

This chapter reviews shipping contents and unpacking procedures for the C Series Controller. Topics include:

- Before You Begin on page 11
- Unpacking the Units on page 11
- Inspecting System Components and Accessories on page 11
- If You Detect or Suspect Damage on page 12
- Contacting Juniper Networks on page 12
- The Next Step on page 12

## Before You Begin

---

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

- A No. 2 Phillips screwdriver
- A utility knife
- A mechanical lift, or at least one person to assist in lifting

## Unpacking the Units

---

The systems are delivered boxed. For your convenience, we recommend that you unpack the system in the location where you want to install it.



**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.

---

## Inspecting System Components and Accessories

---

After you remove the equipment from the shipping containers:

- Confirm the contents of each container.
- Inspect all external surfaces and external connectors for visible signs of damage.

- Inspect all accessories shipped with each unit.
- Document any damage noted during your inspection.
- Confirm that the system has the correct number and type of components for your ordered configuration.

## **If You Detect or Suspect Damage**

---

If you detect or suspect damage to any equipment:

- Contact the shipper responsible for delivery, and formally report the damage.
- Contact your Juniper Networks sales representative or reseller.

## **Contacting Juniper Networks**

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Please contact Juniper Networks at 1-888-314-JTAC (from the United States, Canada, or Mexico) or 1-408-745-9500 (from elsewhere), or contact your sales representative if you have any questions or concerns. See “Contacting Customer Support and Returning Hardware” on page 85 for complete contact information.

## **The Next Step**

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- To familiarize yourself with the electrical, environmental, and other guidelines and requirements for installing the system, see “Installation Guidelines and Requirements” on page 73.
- If you are familiar with these guidelines and requirements, see “Installing and Cabling the C Series Controller” on page 13.

## Chapter 3

# Installing and Cabling the C Series Controller

This chapter describes how to install the C Series Controller and attach cables. Topics include:

- Before You Begin on page 13
- Freestanding Installation on page 13
- Rack-Mounted Installation on page 14
- Cabling the System on page 15
- The Next Step on page 17

## Before You Begin

---

Before installing the system, be sure you:

- Have a plan for installing the system that takes into consideration future expansion.
- Have the tools and accessories needed to complete the installation.
- Read and understand the clearance requirements for the front and back of the chassis for cable routing and other unit access. See “Environmental Requirements” on page 73 for more information.
- Read and understand the clearance requirements for the top and bottom of the chassis to ensure adequate ventilation.
- Prepare the equipment racks by measuring and marking space for each system you plan to install.

## Freestanding Installation

---

When installing the system on a table top or in any other freestanding mode, be sure to leave enough space around the system for adequate ventilation. Position the system with easy access to the connections that it needs for power, local communications, and remote communications.



**WARNING:** Two people are required to lift the system.

---



**CAUTION:** To prevent electrostatic damage to the system and its components, make sure persons handling the system wear an antistatic device.

---

## Rack-Mounted Installation

---

We recommend that you use a standard EIA distribution rack. See “Equipment Rack Requirements” on page 77 for rack information. You can install the system using the front or mid-mount brackets.

### Installation Guidelines

Before installing the systems in a rack, consider the following guidelines:

- You can install several models in a single 7-ft. (2.1-m) rack. Installing multiple systems in a single rack enables you to maximize your available space.
- Install heavier systems on the bottom of the rack. Mount lighter systems higher in the rack.

### Preparing the Equipment Racks

Following your installation plan, use a tape measure and marking pen to measure and mark space on each equipment rack for each system component. For horizontal spacing follow Network Equipment Building System (NEBS) requirements.

### Installing the System

To complete the installation of the system in a rack, you need:

- A Phillips screwdriver
- Eight 10-32 x 3/8 Phillips screws (provided) for each model to be installed

To install the system in the rack:

1. If you are installing the system with the mid-mount brackets, use the provided screws to attach the brackets to the chassis. Use one bracket on each side. (See Figure 1 on page 4.)
2. With one person standing on the left side of the chassis and another standing on the right side, lift the unit into the rack.
3. Position the system in its designated location in the equipment rack. Make sure the holes of the mounting brackets align evenly with the holes of the equipment rack on both sides.

4. Starting at the bottom of the system, have the third person secure the system in the equipment rack by using the 10-32 x 3/8 Phillips screws.
5. Connect the necessary cables.

## Cabling the System

---

Cabling the system requires the following main tasks:

1. Familiarize yourself with the ports, and ensure that you have the cables and wires needed to complete each cabling procedure.
2. Read and understand all safety warnings. (See “Installation Guidelines and Requirements” on page 73.)
3. Connect the system to the network and to a management console.
4. Connect the other interfaces to their appropriate network interface.
5. Connect the power cables from the power source to the system's power supply.



**NOTE:** We recommend that you use shielded cables where appropriate.

---

See “System Specifications” on page 53 for more information about system specifications.

## Cabling the Management Console

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

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

### Management Ports

The management section of the system has three ports for management access (see Figure 7 on page 17 and Figure 9 on page 17):

- Two 10/100Base-T Ethernet ports—Each accepts an RJ-45 (male) connector, providing an out-of-band connection for LAN access through a Telnet session, SSH, or SNMP.
- One RS-232 management port—Accepts a DB-9 (female) connector. This port provides direct CLI access from a console terminal.

The management port is considered a data terminal equipment (DTE) interface. Direct connection to a terminal or PC (which also has DTE interfaces) requires a crossover cable.

See “Setting the Initial Configuration” on page 21 for more information about management access.

### **Connecting to the Network**

To connect the system to the network:

1. Insert an Ethernet cable (RJ-45) connector into the 10/100Base-T (RJ-45) port on the system until it clicks into place.
2. Connect the other end of the cable to the appropriate Ethernet network for an out-of-band connection.

### **Connecting to a Console Terminal**

When you connect a console directly to the system, use a cable appropriate for 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 console:

1. Insert the female DB-9 connector into the RS-232 port, and tighten the screws.
2. Connect the other end of the cable to your terminal's serial port (VT100/ANSI).

## **Cabling Ethernet Interfaces**

Port ETH0 and ETH1 on the C2000 model and the C4000 model accept RJ-45 10/100/1000Base-T Ethernet (copper) interfaces. Port ETH2 and port ETH3 on the C2000 model and the C4000 model accept SFPs.

## **Cabling the System for AC Power**

After you have correctly cabled the system, you can then attach the AC power cord. See Figure 8 on page 17 and Figure 10 on page 17. See “System Specifications” on page 53 for the power requirements for the system.

To cable the system for AC power:

1. Insert the power cord into the AC power IEC receptacle.
2. Insert the other end of the power cord into an appropriate AC power source.



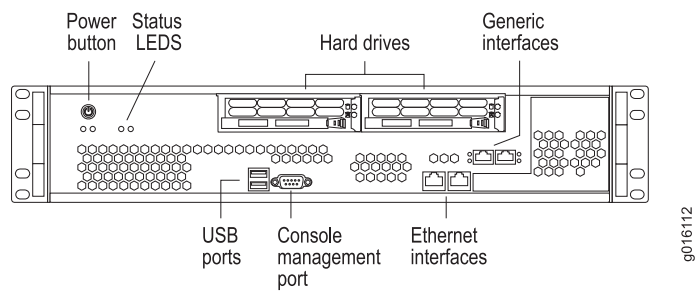
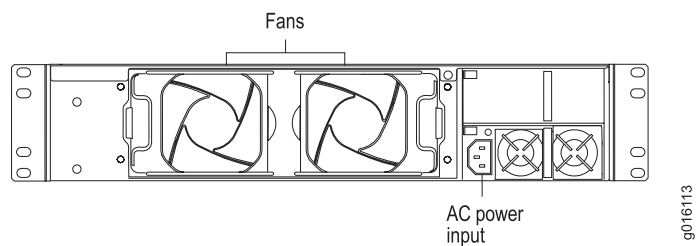
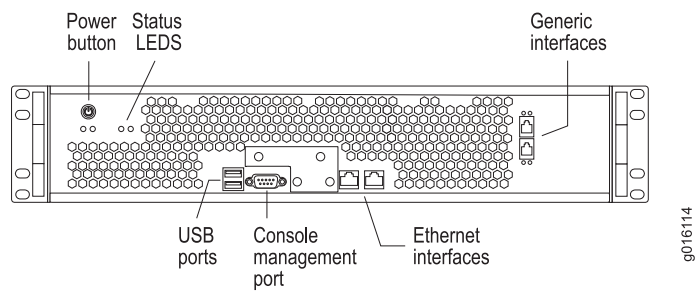
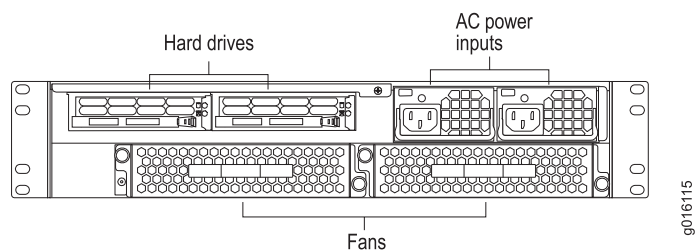
**NOTE:** We suggest that you use an uninterruptible power supply (UPS) with your C Series Controller.



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

---



**Figure 7: C2000, Front View****Figure 8: C2000, Rear View****Figure 9: C4000, Front View****Figure 10: C4000, Rear View**

## The Next Step

After you finish installing and cabling the system:

- See “Powering Up the C Series Controller” on page 19.



## Chapter 4

# Powering Up the C Series Controller

This chapter describes how to power up the C Series Controller. Topics include:

- Powering Up on page 19
- Status LEDs on page 19
- The Next Step on page 20

## Powering Up

---



**NOTE:** In this procedure we assume that the system is already connected to a power source.

---

For specifications of the electrical requirements for the system, see “System Specifications” on page 53.

---



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

---

To power up the system:

1. Verify that the power source is operational and turned on.
2. Inspect all grounding and power connections to the system.
3. Confirm that all connections are secure.
4. Push the PWR button.
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.

See the “Setting the Initial Configuration” on page 21 and *SRC PE CLI User Guide* for more information.

## Status LEDs

---

The LEDs listed in Table 4 on page 20 are used on both models.

**Table 4: Model LEDs**

LED Label	LED Indicator	LED Color	OFF to ON	ON to OFF
PWR	Power	Green	Power on	Power off
HD	Hard drive		Hard drive is functioning	Hard drive failure detected
TEMP	Temperature	Red	Temperature error exists; fan failure	Fan okay
PS FAIL	Power supply failure	Red	Failure detected	Fan okay
LINK	Ethernet	Green	Ethernet link up	Ethernet link down
TX/RX	Ethernet	Green	Blinks when Ethernet traffic on link	No Ethernet traffic on link

## The Next Step

See “Setting the Initial Configuration” on page 21.

## Chapter 5

# Setting the Initial Configuration

This chapter discusses how to set up the C Series Controller after powering it on. For basic information on the management of the system, see the *SRC PE Getting Started Guide*. Topics include:

- Configuration Overview on page 21
- Setting Up Management Access and Logging In on page 21
- Configuring the Juniper Networks Database on page 22
- Configuring Hostname and Domain Parameters on page 23
- Configuring the System for Remote Access on page 24
- Configuring the System to Accept SSH and Telnet Connections on page 25
- Adding an Admin User Account on page 25
- The Next Step on page 27

### Configuration Overview

---

After powering on the system, there are six main steps required to get it ready to work with:

1. Connect a management console to the system, configure it, and log in.
2. Configure the Juniper Networks Database.
3. Configure hostname and domain information.
4. Configure the system for remote access.
5. Configure the system to accept SSH and Telnet connections.
6. Add an Admin user account.

### Setting Up Management Access and Logging In

---

Before you power up the system, you must set up a management console. (See “Connecting to a Console Terminal” on page 16.)

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 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-PE Release 3.2 [V.3.2.0.R-0]
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 3.2 build CLI.R.3.2.0.000
(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. For more information about community mode, see *SRC PE Getting Started Guide, Chapter 10, Managing the Juniper Networks Database*.

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.

```
user@host# edit system ldap server
```

2. Enable standalone mode.

```
[edit system ldap server]
user@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 *SRC PE Getting Started Guide, Chapter 7, Configuring Remote Access to a C Series Controller*.

To configure the generic interfaces:

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

```
user@host# edit interfaces eth0
```

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

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

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

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

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

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

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



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

4. Verify the interface configuration.

```
[edit interfaces eth0]
user@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 *SRC PE Getting Started Guide, Chapter 7, Configuring Remote Access to a C Series Controller with the 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]
user@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]
user@host# set system services telnet
```

## Adding an Admin User Account

---

Although **root** access is used for initial configuration of the system, user accounts are used 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]
user@host # edit system login user user
```

For example:

```
[edit]
user@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]
user@host # set class class
```

For example:

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

3. Specify the name of the administrative user.

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

4. Set the CLI editing level to expert.

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

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

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

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

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

## **The Next Step**

---

See “Maintaining the System” on page 31.



## **Part 3**

# **Hardware Maintenance Procedures and Specifications**

- Maintaining the System on page 31
- Installing the Optional DC Power Supply Module on page 39
- System Specifications on page 53
- Managing RAID Disks on a C Series Controller on page 57
- Configuring IPMI on a C Series Controller (SRC CLI) on page 61
- Configuring IPMI on a C Series Controller (C-Web Interface) on page 69
- Installation Guidelines and Requirements on page 73
- Contacting Customer Support and Returning Hardware on page 85
- Declaration of Conformity on page 89



## Chapter 6

# Maintaining the System

This chapter lists the tools, items, and steps needed for installing and uninstalling components. Other maintenance procedures must be performed by an authorized Juniper Networks technician. Topics include:

- Required Tools and Items on page 31
- Storing Modules and Components on page 31
- Cleaning the System on page 32
- Installing or Replacing an SFP on page 32
- Removing and Installing a Fan on page 35
- Removing and Installing an AC Power Supply Module on page 35
- Removing and Installing a Hard Drive on page 36

### Required Tools and Items

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You need the following tools and other items 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

### Storing Modules and Components

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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.

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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.

## Cleaning the System

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.



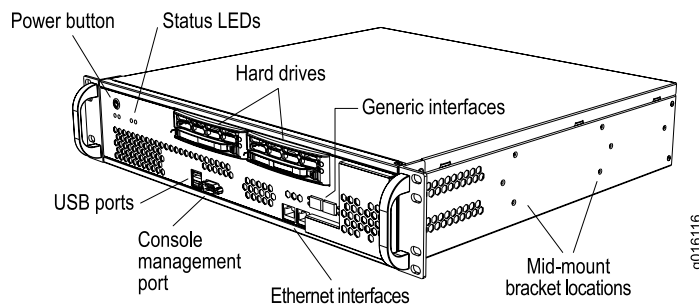
**CAUTION:** When cleaning the system, wear an antistatic device. This action helps to protect components from damage by electrostatic discharge.

## Installing or Replacing an SFP

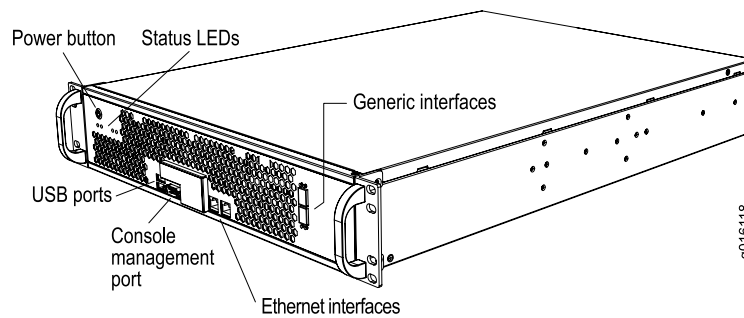
This section describes how to install or replace an SFP. SFPs can be installed in either generic interface port (ETH2 or ETH3). See Figure 11 on page 32 and Figure 12 on page 33 for generic interface port locations.

When replacing an SFP, make sure that you open the ejector handle completely before gently pulling it out of the interface.

**Figure 11: C2000, Front View**





**Figure 12: C4000, Front View**

### Tools and Parts Required

To remove and replace an SFP, you need the following tools and parts:

- Electrostatic bag or antistatic mat, one for each SFP removed
- ESD grounding wrist strap
- Rubber safety caps to cover each unused cable and SFP

### Removing an SFP

To remove an SFP:

1. Have a replacement SFP or a transceiver slot plug ready, as well as an antistatic mat and a rubber safety cap for the SFP.
2. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to an appropriate grounding point.
3. Label the cables connected to the SFP so that you can reconnect them correctly later.



**WARNING:** Do not look directly into a fiber-optic transceiver or into the end of a fiber-optic cable. Fiber-optic transceivers contain laser light sources that can damage your eyes.

4. Remove the cable connector plugged into the SFP.



**CAUTION:** Avoid bending fiber-optic cable beyond its minimum bend radius. An arc smaller than a few inches in diameter can damage the cable and cause problems that are difficult to diagnose.

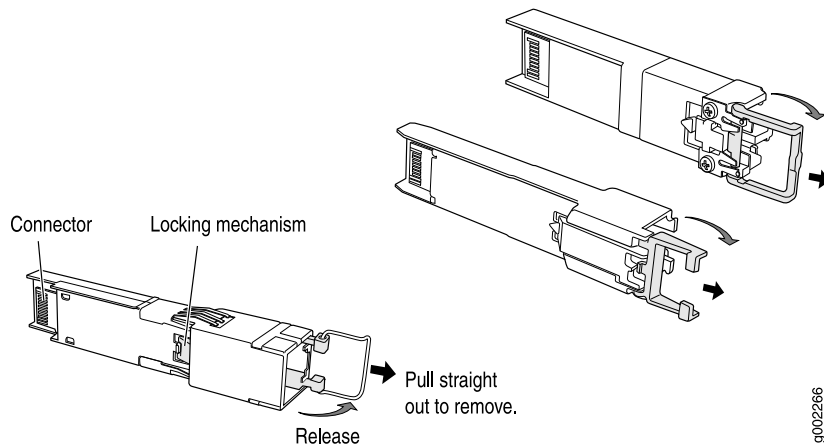
5. Pull the ejector handle out from the SFP to unlock the SFP.



**CAUTION:** Make sure that you open the ejector handle completely (you will hear it click). This prevents damage to the SFP.

6. Grasp the SFP ejector handle, and pull the SFP approximately 0.5 in (1.3 cm) out of the interface port.
7. Using your fingers, grasp the body of the SFP, and pull it the rest of the way out.

**Figure 13: Removing SFPs**



8. Place a rubber safety cap over the transceiver.
9. Place the removed SFP on an antistatic mat or in an electrostatic bag.

## Installing an SFP

To install an SFP:

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to an appropriate grounding point.
2. Take each SFP to be installed out of its electrostatic bag, and identify the interface where it will be installed.
3. Verify that each transceiver is covered by a rubber safety cap. If it is not, cover the transceiver with a safety cap.
4. Carefully align the SFP with the interface. The connectors should face the chassis.
5. Slide the SFP until the connector is seated in the interface. If you are unable to fully insert the SFP, make sure the connector is facing the right way.
6. Remove the rubber safety cap from the transceiver and the end of the cable. Insert the cable into the transceiver.

## Removing and Installing a Fan

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Both C Series models have two cooling fans that provide forced air cooling for components in the system. Each fan is hot-swappable; you can replace it without powering down the system. You can monitor fan status by observing the TEMP LED.



**NOTE:** If the red TEMP LED is illuminated, either a critical or noncritical failure exists.

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**CAUTION:** If the TEMP LED is illuminated and none of the fans is spinning, quickly power down the system until a new set of fans is available. Operating a system with inadequate air circulation can damage the components.

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To remove a fan:

1. Unlock or loosen the fan from the system.
    - For the C2000 model, press the locking tab and rotate the fan away from the system.
    - For the C4000 model, loosen the thumb screw in the top-left and lower-right of the fan.
  2. Pull the fan out and remove it from the system.
 

Use two hands to hold the fan after it comes out of the chassis.
- 



**WARNING:** Do not place your fingers near the fans when removing the unit. The blades might still be moving.

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**CAUTION:** Do not use the fan tray handle to carry the fan. Use the handle only to push the tray into the chassis or pull it out.

---

To install a fan, reverse the steps taken to remove the fan.

## Removing and Installing an AC Power Supply Module

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**NOTE:** If your system is powered on, see the *SRC PE CLI User Guide, Chapter 5, Using the SRC CLI Operational Commands to Monitor the SRC Software* for commands to run before performing these steps.

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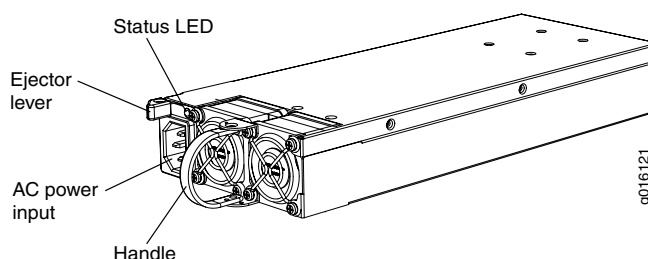
To remove an AC power supply module:

1. Unplug the AC power cord.
2. Slide the locking tab (ejector button) to the left to release the module. See Figure 14 on page 36 and Figure 15 on page 36.
3. Hold the tab to the left, and using the handle, slowly pull the power supply module out.

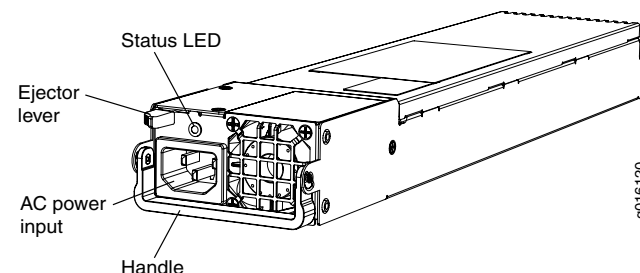
To install an AC power supply module:

1. Hold the locking tab (ejector button) to the left, and slowly slide the module into the chassis until it clicks into place.
2. Insert the power cord into the AC power IEC receptacle.

**Figure 14: C2000 AC Power Supply**



**Figure 15: C4000 AC Power Supply**



## Removing and Installing a Hard Drive



**NOTE:** If your system is powered on, see the *SRC PE Getting Started Guide* for commands to run before performing these steps.

To remove a hard drive:

1. Slide the locking tab in the bottom-right corner to the right to release the hard drive.
2. Hold the tab to the right and slowly pull the unit out.

To install a hard drive, hold the locking tab to the right and slowly slide the unit into the chassis until it clicks into place.



## Chapter 7

# Installing the Optional DC Power Supply Module

This chapter provides information about installing the optional DC power supply available for C Series Controllers. Please read this entire section before proceeding with operations on DC power supplies. Topics include:

- Overview of Installing the DC Power Supply Module on page 39
- Shutting Down the System and Removing the AC Power Supplies on page 40
- Installing the DC Power Supply into the C Series Controller Chassis on page 40
- Grounding the Power Supply and Connecting the DC Power Inputs on page 41
- Powering Up the System on page 42
- Replacing a DC Power Supply in a Redundant System on page 43
- Replacing a DC Power Supply in a Nonredundant System on page 44
- Status LEDs for the Optional DC Power Supply on page 45
- DC Power Specifications on page 45
- DC Power Circuit Breaker Requirements for the C Series Controller on page 47
- DC Power Electrical Safety Guidelines for C Series Controller on page 47
- DC Power Disconnection Warning for C Series Controllers on page 48
- DC Power Grounding Requirements and Warnings for C Series Controllers on page 49
- DC Power Wiring Warnings on page 50

## Overview of Installing the DC Power Supply Module

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By default, all C Series Controllers are equipped with two AC power supplies. Optional DC power supplies may be ordered separately for both the C2000 model and C4000 model. In a DC power configuration, the C Series Controller contains one or two DC power supplies. When two power supplies are installed, they provide power redundancy. If one power supply fails or is removed, the remaining power supply redistributes the electrical load without interruption. The C2000 model uses a 500-W supply and the C4000 model uses a 710-W supply. Both supplies are hot-swappable. Each DC power supply has a single DC input (–48 VDC and return) that requires a dedicated 20-A (–48 VDC) circuit breaker

Installing an optional DC power supply requires the following main tasks:

1. Shut down the system and remove all AC power supplies.
2. Install each DC power supply into the chassis.
3. Ground the power supply and connect the DC power source to each supply.
4. Power up the system and log in.

## Shutting Down the System and Removing the AC Power Supplies

---

Before you can install the optional DC power supply, you must first shut down the system and remove all AC power supplies by performing the following tasks:

1. Gracefully shut down the SRC software by entering the following command:

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

This command stops all system components, halts the operating system, and powers down the C Series Controller.

2. Press the power button on the front of the system.
3. Remove all AC power supplies from the chassis by following the procedure described in “Removing and Installing an AC Power Supply Module” on page 35.

## Installing the DC Power Supply into the C Series Controller Chassis

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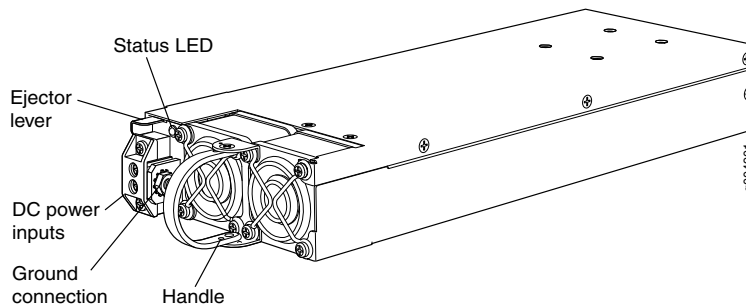
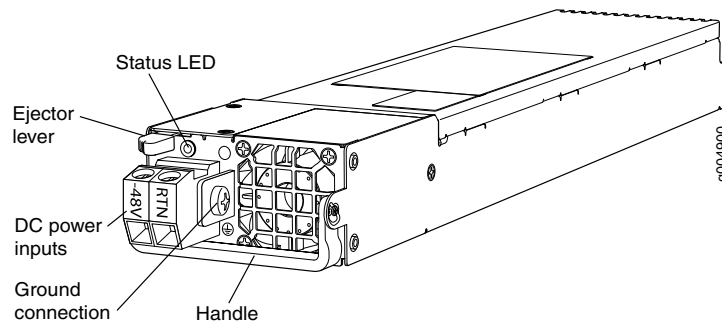
**CAUTION:** Do not mix AC and DC power supplies within the same chassis. Make sure that you are installing the correct DC power supply for your chassis. The C2000 model uses a 500-W supply and the C4000 model uses a 710-W supply. The supplies are not interchangeable.

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To install a DC power supply into the C Series Controller chassis (see Figure 16 on page 41 and Figure 17 on page 41):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to an appropriate grounding point.
2. Hold the locking tab (ejector lever) on the DC power supply to the left, and slowly slide the power supply straight into the chassis until it clicks into place.
3. Repeat Steps 1–2 for each DC power supply.



**Figure 16: C2000 Optional DC Power Supply****Figure 17: C4000 Optional DC Power Supply**

## Grounding the Power Supply and Connecting the DC Power Inputs



**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 source circuit, switch the circuit breaker to the off position, and tape the switch handle of the circuit breaker in the off position.



**NOTE:** For redundant systems, we recommend that you use a dedicated power source for each power supply so that the system can remain operational if a power supply fails and must be replaced.

You ground the device by connecting a grounding cable to earth ground and then attaching it to the grounding point on the DC power supply. You must provide the grounding cables. The cable lug used on the grounding cable should have a #10 stud hole and accommodate a minimum of 12-AWG wire. We recommend using the PANDUIT® LCB8-10H-L lug, which accommodates 8-AWG wire. See Table 9 on page 47 for the specifications of the grounding lug and cables.

You connect DC power to the power supply by attaching power cables from the external DC power source to the terminal block on the DC power supply. You must provide the power cables. You must use a minimum of 12-AWG wire for the power cables. See Table 8 on page 46 for the specifications of the power cables.

To connect the ground and DC power source cables to the power supply:

1. Ensure that the voltage across the DC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.
2. Ground the power supply:
  - a. Loosen the ground connection on the power supply.
  - b. Connect the grounding cable to a proper earth ground.
  - c. Secure the grounding cable to the power supply grounding point.
3. Connect the DC power source input to the power supply:
  - a. Loosen the **–48V** (input) and **RTN** (return) screws on the power supply terminal block.
  - b. Secure the positive ( + ) DC power source cable to the **RTN** (return) terminal on the power supply.
  - c. Secure the negative ( – ) DC power source cable to the **–48V** (input) terminal on the power supply.



**CAUTION:** You must ensure that power connections maintain the proper polarity. The power source cables might be labeled (+) and (–) to indicate their polarity. 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 power cables that attach to the terminal studs on each power supply.

---

4. If you are installing multiple power supplies, repeat Steps 1–3 for each power supply in the chassis.
5. Route and secure the power cables with plastic cable ties, which you must provide.
6. Verify that the power cabling is correct, that the cables are not touching or blocking access to other chassis components, and that they do not drape where people could trip on them.
7. Switch on the DC power source circuit breaker. Follow your site's procedures for safety and ESD.

## Powering Up the System

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After the DC power inputs have been connected and the circuit breaker has been turned on, power up the C Series Controller by performing the following tasks:

1. Press the power button on the front of the chassis.
2. Verify the LED status on each power supply in the chassis. See Table 5 on page 45 for description of the LED status.
3. When the prompt appears on the system console, log in to the system.

## Replacing a DC Power Supply in a Redundant System



**NOTE:** This procedure assumes you have a dedicated power source connected to each power supply. The DC power supplies are hot-swappable; so as long as you have a dedicated power source connected to each supply, the system remains operational.



**WARNING:** Before performing DC power procedures, ensure that power is removed from the DC circuit supplying power to the DC supply you want to replace. 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.



**WARNING:** Do not mix AC and DC power supplies within the same chassis. Make sure that you are installing the correct DC power supply for your chassis. The C2000 model uses a 500-W supply and the C4000 model uses a 710-W supply. The supplies are not interchangeable.

To remove a DC power supply from the C Series Controller:

1. Switch off the dedicated circuit breaker supplying power to the power supply being removed. Follow your site's procedures for ESD.
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. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to an appropriate grounding point.
4. Disconnect the power source cables and ground connection from the power supply in the following order:
  - a. Disconnect the negative (–) DC power source cable –48V (input) from the power supply.
  - b. Disconnect the positive (+) DC power source cable RTN (return) from the power supply.
  - c. Disconnect the ground cable from the grounding point on the power supply.
5. Carefully move the power cables and ground cable out of the way.
6. Slide the locking tab (ejector lever) to the left to release the module. (See Figure 16 on page 41 and Figure 17 on page 41.)
7. Hold the tab to the left, and using the handle, slowly pull the power supply module out of the chassis.

8. Install the replacement power supply by following the steps described in “Installing the DC Power Supply into the C Series Controller Chassis” on page 40.
9. Reconnect the power source cables by following the steps described in “Grounding the Power Supply and Connecting the DC Power Inputs” on page 41.
10. Verify the LED status on both power supplies. See Table 5 on page 45 for description of the LED status.

## Replacing a DC Power Supply in a Nonredundant System

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**WARNING:** Before performing DC power procedures, ensure that power is removed from the DC circuit supplying power to the DC supply you want to replace. 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.

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**WARNING:** Do not mix AC and DC power supplies within the same chassis. Make sure that you are installing the correct DC power supply for your chassis. The C2000 model uses a 500-W supply and the C4000 model uses a 710-W supply. The supplies are not interchangeable.

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To replace a power supply in a nonredundant system:

1. Gracefully shut down the SRC software by entering the following command:

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

This command stops all system components, halts the operating system, and powers down the C Series Controller.

2. Press the power button on the front of the system.
3. Switch off the dedicated circuit breaker supplying power to the power supply being removed. Follow your site's procedures for ESD.
4. 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.
5. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to an appropriate grounding point.
6. Disconnect the power source cables and earth ground connection from the power supply in the following order:
  - a. Disconnect the negative (–) DC power source cable –48V (input) from the power supply.
  - b. Disconnect the positive (+) DC power source cable RTN (return) from the power supply.

- c. Disconnect the ground cable from the grounding point on the power supply.
7. Carefully move the power cables and ground cable out of the way.
8. Slide the locking tab (ejector lever) to the left to release the module. (See Figure 16 on page 41 and Figure 17 on page 41.)
9. Hold the tab to the left, and using the handle, slowly pull the power supply module out of the chassis.
10. Install the replacement power supply by following the steps described in “Installing the DC Power Supply into the C Series Controller Chassis” on page 40.
11. Reconnect the power source cables by following the steps described in “Grounding the Power Supply and Connecting the DC Power Inputs” on page 41.
12. Power up the system and log in; see “Powering Up the System” on page 42.

## Status LEDs for the Optional DC Power Supply

There is a single LED on the DC power supply located above the power source terminal block. The LED descriptions listed in Table 5 on page 45 apply to both the C2000 model 500-W supply and the C4000 model 710-W supply.

**Table 5: DC Power Supply LEDs**

LED Color	Description
Green	The supply is receiving input power and is actively powering the system.
Yellow	The supply is receiving input power.
Off	No power is being supplied to the module.

## DC Power Specifications

- DC Power Supply Electrical Specifications on page 45
- DC Power Cable Specifications for the C Series Controller on page 46
- C Series Controller Grounding Cable and Lug Specifications on page 47

## DC Power Supply Electrical Specifications

Table 6 on page 45 lists the DC power supply electrical specifications for the C2000 DC supply.

**Table 6: C2000 DC Power Supply Electrical Specifications**

Item	Specification
Maximum output power	500 W

**Table 6: C2000 DC Power Supply Electrical Specifications** *(continued)*

Item	Specification
DC input voltage	Minimum: –48 VDC
	Nominal: –48 VDC
	Operating range: –48 to –60 VDC
DC input current rating	10 A @ –48 V nominal operating voltage

Table 7 on page 46 lists the DC power supply electrical specifications for the C4000 DC supply.

**Table 7: C4000 DC Power Supply Electrical Specifications**

Item	Specification
Maximum output power	710 W
DC input voltage	Minimum: –48 VDC
	Nominal: –48 VDC
	Operating range: –48 to –60 VDC
DC input current rating	20 A @ –48 V nominal operating voltage

### **DC Power Cable Specifications for the C Series Controller**

You connect DC power to the power supply by attaching power cables from the external DC power source to the terminal block on the DC power supply. You must provide the power cables. You must use a minimum of 12-AWG wire for the power cables.

Table 8 on page 46 summarizes the specifications for the power cables, which you must supply.

**Table 8: DC Power Cable Specifications**

Cable Type	Specification
Power	12-AWG minimum wire, or as required by the local code.

## C Series Controller Grounding Cable and Lug Specifications



**CAUTION:** Before installation begins, a licensed electrician must attach a cable lug to the grounding cables that you supply. A cable with an incorrectly attached lug can damage the C Series Controller.

You ground the device by connecting a grounding cable to earth ground and then attaching it to the grounding point on the DC power supply. You must provide the grounding cables. The cable lug used on the grounding cable should have a #10 stud hole and accommodate a minimum of 12-AWG wire. We recommend using the PANDUIT® LCB8-10H-L lug, which accommodates 8-AWG wire. The grounding cable that you provide must meet the specifications in Table 9 on page 47.

**Table 9: Grounding Cable Specifications**

Cable Type	Specification
Grounding	12-AWG minimum wire, or as required by the local code.

## DC Power Circuit Breaker Requirements for the C Series Controller

Each DC power supply has a single DC input (–48 VDC and return) that requires a dedicated circuit breaker. For full redundancy and maintenance purposes, we recommend that you use a dedicated site circuit breaker rated for 20 A (–48 VDC) minimum, or as required by local code.

## DC Power Electrical Safety Guidelines for C Series Controller

The following electrical safety guidelines apply to a DC-powered C Series Controller:

- A DC-powered C Series Controller is equipped with a DC power supply which includes a DC terminal block that is rated for the power requirements of a maximally configured system. To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 58 A @ –48 VDC for the system. The 48 VDC facility DC source should be equipped with a circuit breaker rated at 20 A (–48 VDC) minimum. Incorporate an easily accessible disconnect device into the facility wiring. In the United States and Canada, the 48 VDC facility should be equipped with a circuit breaker rated 20 A (–48 VDC) or a minimum of 125% of the power provisioned for the input in accordance with the National Electrical Code in the US and the Canadian Electrical Code in Canada. Be sure to connect the ground wire or conduit to a solid earth ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.
- Run two wires from the circuit breaker box to a source of 48 VDC. Use appropriate gauge wire to handle up to 50 A.

- A DC-powered controller that is equipped with a DC terminal block is intended for installation only in a restricted access location. In the United States, a restricted access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.



**NOTE:** Primary overcurrent protection is provided by the building circuit breaker. This breaker should protect against excess currents, short circuits, and earth faults in accordance with NEC ANSI/NFPA70.

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- Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.
- For personal safety, connect the green and yellow wire to safety (earth) ground at both the C Series Controller and the supply side of the DC wiring.
- The marked input voltage of –48 VDC for a DC-powered C Series Controller is the nominal voltage associated with the battery circuit, and any higher voltages are to be associated only with float voltages for the charging function.
- Because the C Series Controller is a positive ground system, you must connect the positive lead to the terminal labeled **RETURN**, the negative lead to the terminal labeled **–48V**, and the earth ground to the chassis grounding points.

## DC Power Disconnection Warning for C Series Controllers

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**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.

**Waarschuwing** Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroomcircuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom is uitgeschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroomcircuit bedient, draait u de stroomverbreker naar de uit-stand en plakt u de schakelaarhendel van de stroomverbreker met plakband in de uit-stand vast.

**Varoitus** Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

**Attention** Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.



**Warnung:** Vor Ausführung der folgenden Vorgänge ist sicherzustellen, dass der Gleichstromschaltung kein Strom zugeführt wird. Um sicherzustellen, dass der gesamte Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und befestigen Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Position.

**Avvertenza** Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

**Advarsel** Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

**Aviso:** antes de ligar em uma fonte de corrente CC, desligue a fonte do circuito CC. Para garantir que toda fonte de alimentação tenha sido desligada, localize o disjuntor na placa do painel que serve o circuito CC, coloque o disjuntor na posição off (desligado) e fixe a alavanca da chave do disjuntor do circuito com fita adesiva na posição off (desligado).

**Advertencia:** Antes de realizar cualquier procedimiento con la alimentación de CC, asegúrese de desconectar la alimentación del circuito de CC. Para asegurarse de que toda la alimentación esté desconectada, localice el disyuntor en el cuadro de instrumentos que alimenta al circuito de CC, cambie el disyuntor a la posición de apagado, y fije el asa del disyuntor en la posición de apagado.

**Warning!** Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

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## DC Power Grounding Requirements and Warnings for C Series Controllers

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An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors, but is identifiable by green and yellow stripes, is installed as part of the branch circuit that supplies the unit. The grounding conductor is a separately derived system at the supply transformer or motor generator set.



**WARNING:** When you install the device, the ground connection must always be made first and disconnected last.

**Waarschuwing** Bij de installatie van het toestel moet de aardverbinding altijd als eerste worden gemaakt en als laatste worden verbroken.

**Varoitus** Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

**Attention** Lors de l'installation de l'appareil, le fil de mise à la terre doit toujours être branché en premier et débranché en dernier.

**Warnung:** Der Erdanschluss muss bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

**Avvertenza** In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

**Advarsel** Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

**Aviso:** ao instalar o dispositivo, a conexão terra deve ser sempre a primeira a ser ligada, e a última a ser desligada.

**Advertencia:** Al instalar el equipo, la conexión a tierra debe ser la primera en establecerse y la última en desconectarse.

**Warning!** Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

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## DC Power Wiring Warnings

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- DC Power Wiring Sequence Warning for C Series Controllers on page 50
- DC Power Wiring Terminations Warning for C Series Controllers on page 52

### DC Power Wiring Sequence Warning for C Series Controllers

---



**WARNING:** Wire the DC power supply using the appropriate lugs. When you connect the power, the proper wiring sequence is ground to ground, + RTN to + RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, + RTN to + RTN, then ground to ground. Note that the ground wire should always be connected first and disconnected last.

**Waarschuwing** Sluit de gelijkstroomvoedingseenheid aan met behulp van de geschikte aansluitpunten. De juiste bedradingsvolgorde verbonden is aarde naar aarde, + RTN naar + RTN, en –48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en –48 V naar –48 V, + RTN naar + RTN, aarde naar aarde. Denk eraan dat bij de installatie van het toestel de aardverbinding altijd als eerste moet worden gemaakt en als laatste moet worden verbroken.

**Varoitus** Kytke tasavirtalähde käyttäen asianmukaisia kaapelikenkiä. Oikea yhdistettävä kytkentäjäjestys on maaajohto maaajohtoon, + RTN varten + RTN, –48 V varten – 48 V. Oikea irrotettava kytkentäjäjestys on –48 V ja – 48 V, + RTN ja

+ RTN, maajohto maajohdosta. Huomaa, että maajohto on aina kytkettävä ensimmäiseksi ja irrotettava viimeiseksi.

**Attention** Raccordez le bloc d'alimentation CC en utilisant les œillets appropriés. Pour raccorder l'unité à l'alimentation, l'ordre de câblage approprié est terre à terre, + RTN à + RTN, puis -48 V à -48 V. Pour couper l'alimentation, l'ordre de câblage approprié est -48 V à -48 V, + RTN à + RTN puis terre à terre. Notez que le fil de mise à la terre doit toujours être branché en premier et débranché en dernier.

**Warnung:** Schließen Sie das Gleichstromnetzteil nur mit geeigneten Anschlussklemmen an. Korrekte Anschlussreihenfolge: Erdanschluss zu Erdanschluss, + RTN zu + RTN und dann -48V zu -48V. Die richtige Reihenfolge zum Trennen der Stromzufuhr ist -48V zu -48V, + RTN zu + RTN und dann Erdanschluss zu Erdanschluss. Der Erdleiter muss immer zuerst angeschlossen und als letztes getrennt werden.

**Avvertenza** Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio. Per la connessione dell'alimentazione, la corretta sequenza di cablaggio è da massa a massa, da + RTN a + RTN e da -48 V a -48 V. Per la disconnessione, la corretta sequenza è da -48 V a -48 V, da + RTN a + RTN e da massa a massa. Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

**Advarsel** Bruk egnede kabelsko for tilkopling av likestrømmen. Riktig tilkoplet tilkopplingssekvens er jord til jord, + RTN til + RTN, -48 V til -48 V. Riktig frakoplet tilkopplingssekvens er -48 V til -48 V, + RTN til + RTN, jord til jord. Merk at jordledningen alltid må koples til først og koples fra sist.

**Aviso:** ligue a fonte de alimentação CC com os terminais apropriados. Ao conectar a fonte de alimentação, a sequência correta é terra para terra, + RTN para + RTN, e em seguida -48 V para -48 V. Ao desligar a fonte, a sequência correta é -48 V para -48 V, + RTN para + RTN, e em seguida terra para terra. Observe que a ligação terra deve ser sempre conectada primeiro e desligada por último.

**Advertencia:** Realice el cableado de la fuente de alimentación de CC con los terminales apropiados. Al conectar la alimentación, la secuencia de cableado apropiada es de tierra a tierra, + RTN a + RTN, luego -48 V a -48 V. Al desconectar la alimentación, la secuencia de cableado apropiada es -48 V a -48 V, + RTN a + RTN, luego tierra a tierra. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el cable a tierra siempre debe ser el primero en conectarse y el último en desconectarse.

**Varning!** Använd lämpliga tappar vid påkoppling av likströmskretsen. När man kopplar på ström är korrekt kopplingssekvens jord till jord, + RTN till + RTN, -48 V till -48 V. När man kopplar ur ström är korrekt kopplingssekvens -48 V till -48 V, + RTN till + RTN, jord till jord. Observera att jordledningen alltid måste anslutas först och kopplas bort sist.

## DC Power Wiring Terminations Warning for C Series Controllers



**WARNING:** When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor.

**Waarschuwing** Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

**Varoitus** Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetty kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

**Attention** Lorsqu'un raccordement torsadé est requis, utilisez des fiches de câbles homologuées, de type boucle fermée ou cosse à fourche. La taille de ces fiches doit être adaptée aux câbles et doit recouvrir l'isolant et le conducteur.

**Warnung:** Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Anschlussklemmen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

**Avvertenza** Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcilla con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

**Advarsel** Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og ledaren.

**Aviso:** quando for necessário usar fiação trançada, use terminais aprovados para fiação, tipo faston ou espada, virados para cima. Esses terminais devem ter o tamanho apropriado para os fios, além de fixarem o isolamento e o condutor.

**Advertencia:** Cuando sea necesario emplear un cable trenzado, utilice terminadores de cables aprobados, tales como los de bucle cerrado o planos, con las lengüetas hacia arriba. Estos terminadores deben tener el tamaño apropiado para los cables y deben sujetar tanto el aislante como el conductor.

**Varning!** När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

## Chapter 8

# System Specifications

This chapter lists the system specifications, requirements, and certifications for the system. Topics include:

- C2000 Model Specifications on page 53
- C4000 Model Specifications on page 54

### C2000 Model Specifications

**Table 10: C2000 Model Specifications**

Category	Specification
<b>Weight</b>	33 lb (15 kg)
<b>Dimensions</b>	3.5 (H) x 16.7 (W) x 16.2 (D) inches 8.89 (H) x 42.42 (W) x 41.15 (D) cm
<b>Environmental Requirements</b>	
Temperature	<ul style="list-style-type: none"><li>■ Operating: 50° to 104° F (10° to 40° C)</li><li>■ Storage: -40° to 158° F (-40° ° to 70° C)</li></ul>
Relative humidity	<ul style="list-style-type: none"><li>■ Operating: 8 % to 90 % (noncondensing)</li><li>■ Storage: 5 % to 95 % (noncondensing)</li></ul>
<b>Heat Dissipation</b>	500 W, 1706 BTU/hour maximum
<b>AC Input</b>	
Power required	<ul style="list-style-type: none"><li>■ 90-132 VAC (115V Nominal), 47-63 Hz</li><li>■ 180-264 VAC (230V Nominal), 47-63 Hz</li></ul>
Power	500 W
Efficiency	65 % minimum at full load
<b>DC Input</b>	
Voltage	-48 to -60 VDC
Current	-48 V nominal
Power	500 W

**Table 10: C2000 Model Specifications** *(continued)*

Category	Specification
Efficiency	70 % minimum at full load
<b>Space Requirements</b>	<ul style="list-style-type: none"> <li>■ 3 feet (90 cm) behind system or rack.</li> <li>■ Do not block air vents on front or back of the system.</li> </ul>
<b>Safety Agency Certification</b>	<ul style="list-style-type: none"> <li>■ CAN/CSA-C22.2 No. 60950-1-03</li> <li>■ EN 60950-1:2001 + A11</li> <li>■ EN 60825-1:1994 + A1 + A2</li> <li>■ Low Voltage Directive 73/23/EEC</li> <li>■ UL 60950-1:2003</li> </ul>
<b>Airflow</b>	<ul style="list-style-type: none"> <li>■ Air intake occurs in the front of the system.</li> <li>■ Air is exhausted out of the rear of the system.</li> </ul>
<b>Electromagnetic Emissions Agency Certification</b>	<ul style="list-style-type: none"> <li>■ AZ/NZS CISPR 22:2002</li> <li>■ EMC Directive (89/336/EEC)</li> <li>■ EN 300 386 V1.3.3:2005</li> <li>■ EN 300 386 V1.3.3:2005</li> <li>■ EN 55022:1998 + A1 (2000) + A2(2003) Class A</li> <li>■ EN 55024: 1998 + A1: 2001 + A2: 2003</li> <li>■ EN 61000-3-2:2001</li> <li>■ EN 61000-3-3:1995</li> <li>■ FCC Part 15 Subpart B</li> <li>■ VCCI (Voluntary Control Council for Interference by Information Technology Equipment)</li> </ul>

## C4000 Model Specifications

**Table 11: C4000 Model Specifications**

Category	Specification
<b>Weight</b>	48 lb (22 kg)
<b>Dimensions</b>	3.5 (H) x 16.7 (W) x 24 (D) inches 8.89 (H) x 42.42 (W) x 60.96 (D) cm
<b>Environmental Requirements</b>	
Temperature	<ul style="list-style-type: none"> <li>■ Operating: 50° to 104° F (10° to 40° C)</li> <li>■ Storage: -40° to 158° F (-40° ° to 70° C)</li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>■ Operating: 8 % to 90 % (noncondensing)</li> <li>■ Storage: 5 % to 95 % (noncondensing)</li> </ul>
Ambient storage temperature	-40° ° to 158° F (-40° ° to 70° C), 95 % relative humidity

**Table 11: C4000 Model Specifications** (continued)

Category	Specification
Ambient storage humidity	5 % to 95 % (noncondensing)
<b>Heat Dissipation</b>	700 W, 2389 BTU/hour maximum
<b>AC Input</b>	
Power required	90-264 VAC, 47–63 Hz
Power	700 W
Efficiency	80 % minimum at full load
<b>DC Input</b>	
Voltage	-48 to -60 VDC
Current	-48 V nominal
Power	500 W
Efficiency	70 % minimum at full load
<b>DC Input</b>	
Voltage	-48 to -60 VDC
Current	-48 V nominal
Power	500 W
Efficiency	70 % minimum at full load
<b>DC Input</b>	
Voltage	-48 to -60 VDC
Current	-48 V nominal
Power	710 W
Efficiency	89 % minimum at full load
<b>Space Requirements</b>	<ul style="list-style-type: none"> <li>■ 3 feet (90 cm) behind system or rack.</li> <li>■ Do not block air vents on or back of the system.</li> </ul>
<b>Airflow</b>	<ul style="list-style-type: none"> <li>■ Air intake occurs in the front of the system.</li> <li>■ Air is exhausted out of the rear of the system.</li> </ul>
<b>Safety Agency Certification</b>	<ul style="list-style-type: none"> <li>■ CAN/CSA-C22.2 No. 60950-1-03</li> <li>■ EN 60950-1:2001 + A1 1</li> <li>■ EN 60825-1:1994 + A1 + A2</li> <li>■ Low Voltage Directive 73/23/EEC</li> <li>■ UL 60950-1:2003</li> </ul>

**Table 11: C4000 Model Specifications** *(continued)*

Category	Specification
<b>Electromagnetic Emissions Agency Certification</b>	<ul style="list-style-type: none"> <li>■ AZ/NZS CISPR 22:2002</li> <li>■ EMC Directive (89/336/EEC)</li> <li>■ EN 55022:1998 + A1 (2000) + A2(2003) Class A</li> <li>■ EN 55024: 1998 + A1: 2001 + A2: 2003</li> <li>■ EN 61000-3-2:2001</li> <li>■ EN 61000-3-3:1995</li> <li>■ FCC Part 15 Subpart B</li> <li>■ VCCI (Voluntary Control Council for Interference by Information Technology Equipment)</li> </ul>



## Chapter 9

# Managing RAID Disks on a C Series Controller

This chapter describes how to manage and view status information for RAID disks on a C Series Controller. Topics include:

- C Series Controller Data Storage on page 57
- Managing Disks in a C Series Controller on page 57

## C Series Controller Data Storage

---

A C Series Controller provides data redundancy by supplying two hard drives (or disks) in a redundant array of independent disks (RAID). Both disks are configured as a RAID-1 mirror; this means that data is concurrently written to both disks. If one disk becomes inoperable, the remaining disk continues to be active, which allows the C Series Controller to continue to function.

When you replace a faulty disk and initialize it, or disable and then enable a disk, the RAID controller copies all the data from the active disk to the enabled or initialized disk and establishes mirroring for the two disks.

The location of the disk mount for the disks depends on the model of the C Series Controller:

- C2000 system—Front of chassis
- C4000 system—Back of chassis

When you access the disks in the disk mount:

- Disk 0 is to the left.
- Disk 1 is to the right.

You can also use the **request disk identify** command to make the LED for a specified disk blink to verify which disk is disk 0 and which is disk 1.

## Managing Disks in a C Series Controller

---

The SRC CLI provides commands to let you monitor disk status, replace faulty disks, and reinitialize disks in the system.

## Replacing or Swapping a Disk

You can replace a failed disk or swap a working disk in a C Series Controller. Note the following limitations:

- Replacing a disk— You can replace it while the other disk remains active.
- Swapping a disk—You cannot remove both disks in the C Series Controller at the same time. Do not power down the system or initialization errors may occur.

To replace or swap a disk:

1. Disable the disk.

```
user@host> request disk disable device 0 | 1
```



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

---

2. Remove the disk from the system.
3. Insert a new disk.
4. Enable the disk.

```
user@host> request disk enable device 0 | 1
```

5. Initialize the new disk.

```
user@host> request disk initialize device 0 | 1
```

The command generates data on the disk that enables the disk controller to manage the disk. The disk controller copies data from the other disk and establishes mirroring between the two disks.

6. Verify that the disk is initialized.

```
user@host> show disk status
```

## Reinitializing an Active Disk

You can reinitialize a disk that is already active in a C Series Controller.

To reinitialize a disk:

- Initialize the disk.

```
user@host> request disk initialize device 0 | 1 force
```

The command generates data on the disk that enables the disk controller to manage the disk. The disk controller copies data from the other disk and establishes mirroring between the two disks.

## Viewing Information About Disks on a C Series Controller

To view information about disks in the C Series Controller:

- Enter the show disk status command.

```
user@host> show disk status
```

### Controller information

```
Controller Status           : Optimal
Channel description         : SATA
Controller Model            : Adaptec 2020SA
Controller Serial Number    : BAD0
Physical Slot               : 2
Installed memory            : 64 MB
Copyback                   : Disabled
Background consistency check : Disabled
Defunct disk drive count    : 0
Logical devices/Failed/Degraded : 1/0/0
```

### Controller Version Information

```
BIOS                       : 4.2-1 (7387)
Firmware                   : 4.2-1 (7387)
Driver                     : 1.1-5 (2449)
Boot Flash                 : 0.0-0 (0)
```

### Controller Battery Information

```
Status                     : Not Installed
```

### Logical device information

#### Logical device number 1

```
Logical device name        : SRC-PE
RAID level                 : 1
Status of logical device   : Optimal
Size                      : 70857 MB
Read-cache mode           : Enabled
Write-cache mode          : Disabled (write-through)
Write-cache setting        : Disabled (write-through)
Number of chunks           : 2
Drive(s) (Channel,Device) : 0,1 0,0
```

### Physical device information

#### Channel #0:

```
Transfer Speed             : SATA 3.0 Gb/s
```

#### Device #0

```
Device is a Hard drive
```

```
State                     : Online
```

```
Transfer Speed            : SATA 1.5 Gb/s
```

```
Reported Channel,Device   : 0,0
```

```
Reported Enclosure,Slot   : 0,0
```

```
Vendor                    : WDC
```

```

Model                : WD740ADFD-00NLR5
Firmware             : 21.0
Serial number        : WD-WMANS1972929
Size                 : 70911 MB
Write Cache          : Unknown
FRU                  : None
S.M.A.R.T.           : No
Device #1
Device is a Hard drive
State                : Online
Transfer Speed       : SATA 1.5 Gb/s
Reported Channel,Device : 0,1
Reported Enclosure,Slot : 0,1
Vendor               : WDC
Model                : WD740ADFD-00NLR5
Firmware             : 21.0
Serial number        : WD-WMANS2000570
Size                 : 70911 MB
Model                : WD740ADFD-00NLR5
Firmware             : 21.0
Serial number        : WD-WMANS2000570
Size                 : 70911 MB
Write Cache          : Unknown
FRU                  : None
S.M.A.R.T.           : No
Device #14
Device is an Enclosure
Type                 : SAF-TE
Vendor               : QLogic
Model                : GEM424
Firmware             : 0101
Status of Enclosure
Temperature status    : Normal

```

Command completed successfully.

Current operation : None

Command completed successfully.

## Chapter 10

# Configuring IPMI on a C Series Controller (SRC CLI)

This chapter describes how to configure IPMI on a C Series Controller with the SRC CLI. Topics include:

- Overview of IPMI on page 61
- Commands to Manage an IPMI Interface on page 62
- Configuring IPMI with the SRC CLI on page 62
- Viewing IPMI Chassis Information on page 63
- Viewing Power Status of a Controller Using IPMI on page 64
- Powering a Controller On and Off Using IPMI on page 65
- Viewing IPMI User Accounts on page 66
- Creating IPMI User Accounts on page 66
- Connecting to a Serial Console Using IPMI Serial over LAN (SOL) on page 67
- Disconnecting from a Serial Console Using IPMI Serial over LAN (SOL) on page 67

## Overview of IPMI

---

Intelligent Platform Management Interface (IPMI) is a message-based hardware management interface that enables remote monitoring, management, and recovery capabilities, regardless of the status of the server. It defines a set of interfaces that are common to computer hardware and firmware that you can use to monitor system health and manage the system.

IPMI operates independently of the operating system (OS) and allows you to manage a system remotely even in the absence of the OS or the system management software, or even if the monitored system is not powered on. IPMI can also function when the OS has started.

IPMI version 1.5 and later can send out alerts by means of a direct serial connection, a LAN, or a serial over LAN (SOL) connection to a remote client. You can then query controller status, review hardware logs, or issue other requests from a remote console through the same connections.

## Commands to Manage an IPMI Interface

---

You can use the following operational mode commands to manage IPMI interfaces:

- `ipmisol open`
- `ipmisol close remote-session`
- `ipmisol close local-session`

For detailed information about each command, see the *SRC PE CLI Command Reference*.

## Configuring IPMI with the SRC CLI

---

For the C2000 model, an IPMI configuration includes an IP address assigned to the IPMI interface and a gateway IP address. For the C4000 model, only a gateway IP address is required because the IP address for the IPMI interface is the same as the IP address assigned to the eth0 interface on the C4000 model.

Use the following configuration statements to configure an IPMI interface on a C Series Controller:

```
system ipmi {
    address address;
    gateway gateway;
    user name;
}
```

To configure IPMI on an interface:

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

```
user@host# edit system ipmi
```

2. Set the IP address.

```
[edit system ipmi]
user@host# set address address/destination prefix
```

An IP address is required for a C2000 model but is set automatically to the address of the eth0 interface on a C4000 model.

3. Set the default gateway IP address. A default gateway is a node on a network that serves as an access point to another network.

```
[edit system ipmi]
user@host# set gateway gateway
```

4. Verify the configuration.

```
[edit system ipmi]
user@host# show
```

```
address 10.227.7.145/24;
gateway 10.227.7.1;
```

## Viewing IPMI Chassis Information

---

You can view IPMI chassis information for the controller you are currently logged in to and for a remote controller. You must be logged on as a root user.

To display the chassis information on the local controller using IPMI:

1. Log in as root user.

```
SRC-PE Release 3.1 [R.3.1.0-12]
login: root
```

2. Enter the password.

```
Password: password
```

You are now logged in as root user.

3. Access the CLI.

```
[root@host ~]# cli
```

```
— SRC CLI 3.1 build CLI.R.3.1.0.012
(c) 2005-2008 Juniper Networks Inc.
root@host>
```

4. Enter the `show ipmi chassis` command.

For example:

```
root@host>show ipmi chassis

System Power           : on
Power Overload          : false
Power Interlock         : inactive
Main Power Fault       : false
Power Control Fault    : false
Power Restore Policy   : always-off
Last Power Event       :
Chassis Intrusion      : inactive
Front-Panel Lockout    : inactive
Drive Fault            : false
Cooling/Fan Fault      : false

System Power           : on
Power Overload          : false
Power Interlock         : inactive
Main Power Fault       : false
Power Control Fault    : false
Power Restore Policy   : always-off
Last Power Event       :
Chassis Intrusion      : inactive
Front-Panel Lockout    : inactive
```

```
Drive Fault      : false
Cooling/Fan Fault : false
```

To display the IPMI chassis information on a remote controller:

1. Log in as root user.
2. Enter the `show ipmi host chassis` command.

```
user@host>show ipmi host host user user chassis
```

- host—IP address of remote host IPMI interface
- user—IPMI username configured in the remote host

For example:

```
root@host>show ipmi host 10.10.10.30 user johndoe chassis
```

## Viewing Power Status of a Controller Using IPMI

---

You can view IPMI power information for the controller you are currently logged on to and for a remote controller. You must be logged in as a root user.

To display power status (on or off) of the local controller using IPMI:

1. Log in as root user.

```
SRC-PE Release 3.1 [R.3.1.0-12]
login: root
```

2. Enter the password.

```
Password: password
```

You are now logged in as root user.

3. Access the CLI.

```
[root@host ~]# cli
```

```
— SRC CLI 3.1 build CLI.R.3.1.0.012
(c) 2005-2008 Juniper Networks Inc.
root@host>
```

4. Enter the `show ipmi power` command.

For example:

```
root@host>show ipmi power

Chassis Power is on
```

To display power status information on a remote controller using IPMI:

1. Log in as root user.



2. Enter the `show ipmi host power` command.

```
root@host>show ipmi host host user user power
```

- host—IP address of remote host IPMI interface
- user—IPMI username configured in the remote host

For example:

```
root@host>show ipmi host 10.10.10.30 user johndoe power
```

## Powering a Controller On and Off Using IPMI

---

You can power on or off, and reset a C Series Controller you are currently logged in to and for a remote controller. You must be logged on as a root user.

To execute a power command in the local controller using IPMI:

1. Log in as root user.

```
SRC-PE Release 3.1 [R.3.1.0-12]
login: root
```

2. Enter the password.

```
Password: password
```

You are now logged in as root user.

3. Access the CLI.

```
[root@host ~]# cli

— SRC CLI 3.1 build CLI.R.3.1.0.012
(c) 2005-2008 Juniper Networks Inc.
root@host>
```

4. Enter the `request ipmi power` command.

```
user@host>request ipmi power (on | off | soft-off | reset| cycle)
```

- on—Power on a C Series Controller
- off—Power off a C Series Controller. This command does not initiate a clean shutdown of the operating system before powering off the system.
- soft-off—Power off a C Series Controller softly. This command initiates a soft shutdown of the operating system before powering off the system.
- reset—Perform a hard reset on a C Series Controller.
- cycle—Power off and then power on a C Series Controller.

For example:

```
user@host>request ipmi power off
```

To execute a power command on a remote controller using IPMI:

1. Log in as root user.
2. Enter the `request ipmi host user power` command.

```
root@host>request ipmi host host user user power (on | off | soft-off | reset|
cycle)
```

For example:

```
root@host>request ipmi host 10.10.10.30 user johndoe power reset
```

## Viewing IPMI User Accounts

---

To display the IPMI user accounts:

- From configuration mode, enter the `show` command to display all IPMI user accounts.

```
[edit system ipmi]
admin@gnome# show
address 10.227.1.145/24;
gateway 10.227.7.1;
user admin {
    encrypted-password *****;
}
user jdoe {
    encrypted-password *****;
}
```

## Creating IPMI User Accounts

---

An IPMI username and password are required to connect to a remote IPMI interface. You can define new IPMI user accounts using the CLI.

To create an IPMI user account:

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

```
user@host# edit system ipmi
```

2. Set a plain-text password that is autoencrypted by the CLI.

```
[edit system ipmi]
user@host# set user name plain-text-password
```

For example:

```
user@host#set user johndoe plain-text password
```

New password: **xyz123** (text will not appear)  
 Re-type new password: **xyz123** (text will not appear)

3. Verify the configuration.

```
[edit system ipmi]
admin@gnome# show
address 10.227.1.145/24;
gateway 10.227.7.1;
user admin {
    encrypted-password *****;
}
user jdoe {
    encrypted-password *****;
}
```

## Connecting to a Serial Console Using IPMI Serial over LAN (SOL)

---

IPMI SOL enables a remote user to monitor and manage a C Series Controller through a serial console by means of an IPMI session. IPMI SOL redirects the C Series Controller's serial port input and output over IP. To connect to a remote serial console using IPMI SOL, the remote system must have IPMI configured. Only one IPMI SOL connection is allowed per IPMI interface.

To connect to a serial host using IPMI SOL:

- From operational mode, enter the `ipmisol open` command to connect to a serial console.

```
user@host>ipmisol open host host user user
```

- `host`—IP address of remote host IPMI interface
- `user`—IPMI user name configured in the remote host

For example:

```
user@host>ipmisol open host 10.10.10.30 user johndoe
```

To exit from the current IPMI SOL session, enter `~`.

## Disconnecting from a Serial Console Using IPMI Serial over LAN (SOL)

---

Only one IPMI SOL connection is allowed per IPMI interface. You can close the active IPMI connection to a local host or to a remote host.

To disconnect from a local host using IPMI SOL:

- From operational mode, enter the `ipmisol close local-session` command to close the active IPMI connection to a local host.

```
user@host>ipmisol close local-session host
```

To disconnect from a remote host using IPMI SOL:

- From operational mode, enter the `ipmisol close remote-session host` command to close the active IPMI connection to a remote host.

```
user@host>ipmisol close remote-session host host user user
```

- `host`—IP address of remote host IPMI interface
- `user`—IPMI user name configured in the remote host

For example:

```
user@host>ipmisol close remote-session host 10.10.10.30 user johndoe
```

## Chapter 11

# Configuring IPMI on a C Series Controller (C-Web Interface)

This chapter describes how to configure IPMI on a C Series Controller with the C-Web interface. Topics include:

- Overview of IPMI on page 69
- Configuring IPMI with the C-Web Interface on page 69
- Viewing IPMI User Accounts with the C-Web Interface on page 70
- Creating an IPMI User Account with the C-Web Interface on page 70
- Deleting an IPMI User Account with the C-Web Interface on page 70
- Renaming an IPMI User Account with the C-Web Interface on page 71

## Overview of IPMI

---

Intelligent Platform Management Interface (IPMI) is a message-based hardware management interface that enables remote monitoring, management, and recovery capabilities, regardless of the status of the server. It defines a set of interfaces that are common to computer hardware and firmware that you can use to monitor system health and manage the system.

IPMI operates independently of the operating system (OS) and allows you to manage a system remotely even in the absence of the OS or the system management software, or even if the monitored system is not powered on. IPMI can also function when the OS has started.

IPMI version 1.5 and later can send out alerts by means of a direct serial connection, a LAN, or a serial over LAN (SOL) connection to a remote client. You can then query controller status, review hardware logs, or issue other requests from a remote console through the same connections.

## Configuring IPMI with the C-Web Interface

---

For the C2000 model, an IPMI configuration includes an IP address assigned to the IPMI interface and a gateway IP address. For the C4000 model, only a gateway IP address is required because the IP address for the IPMI interface is the same as the IP address assigned to the eth0 interface on the C4000 model.

To configure IPMI on an interface:

1. Click **Configure**, expand **System**, and then click **IPMI**.  
The IPMI pane appears.
2. In the Address box, enter an IP address.
  - An IP address is required for a C2000 model but is set automatically to the address of the eth0 interface on a C4000 model.
  - **address** is in the format IP address/destination prefix, such as 10.227.7.145/24.
3. In the Gateway box, enter the default gateway IP address.  
A default gateway is a node on a network that serves as an access point to another network.
4. Click **Apply**.  
The IPMI pane displays the new attributes.

## Viewing IPMI User Accounts with the C-Web Interface

---

To display the IPMI user accounts:

- Click **Configure**, expand **System**, and then click **IPMI > User**.  
IPMI user accounts are listed in the main pane.

## Creating an IPMI User Account with the C-Web Interface

---

An IPMI username and password are required to connect to an IPMI interface. You can create new IPMI user accounts so that IPMI authentication can occur.

To create an IPMI user account:

1. Click **Configure**, expand **System**, and then click **IPMI**.  
The IPMI pane appears.
2. Select **User** from the drop-down list, enter the name of the user in the pop-up dialog box, and click **OK**.  
The IPMI / User pane appears.
3. Enter a password. When the user account is created, the password is encrypted with a Base64 encoding scheme.
4. Click **Apply**.  
The IPMI user appears in the side pane under IPMI.

## Deleting an IPMI User Account with the C-Web Interface

---

To delete an IPMI user account:

1. Click **Configure**, expand **System**, and then click **IPMI**.

2. In the side pane under IPMI, select the user account you want to delete.  
The IPMI / User: (username) pane appears.
3. Click the user account and then click **Delete** in the IPMI / User: (username) pane.  
The user account is deleted.

## Renaming an IPMI User Account with the C-Web Interface

---

To rename an IPMI user account:

1. Click **Configure**, expand **System**, and then click **IPMI**.
2. In the navigation tree under IPMI, select the user account you want to rename.  
The IPMI / User: (username) pane appears.
3. Click the user account and then click **Rename** in the IPMI / User: (username) pane.  
The user account is deleted.
4. Type a new name and click **OK**.  
The user account is renamed.





## Chapter 12

# Installation Guidelines and Requirements

This chapter reviews preinstallation considerations such as electrical, environmental, and safety compliances for the C Series Controllers. For complete system specifications, see “System Specifications” on page 53. Topics include:

- Your Preinstallation Responsibilities on page 73
- Environmental Requirements on page 73
- Regulatory Compliances on page 74
- Safety Notices on page 74
- Safety Guidelines on page 76
- Equipment Rack Requirements on page 77
- Cabling Recommendations on page 78
- Product Reclamation and Recycling Program on page 79
- Hardware Compliance on page 80

### Your Preinstallation Responsibilities

---

Complete the following tasks before installing the system:

- Verify that the electrical supply meets all AC and DC power requirements. See “System Specifications” on page 53.
- Verify that the site meets all environment specifications. See “Environmental Requirements” on page 73 and “System Specifications” on page 53.
- Verify that the cables you plan to use meet the specifications, and review the cabling recommendations. See “Cabling Recommendations” on page 78.
- Verify the operation of all telephone circuits, digital services, and T1 facilities required for installation.
- Ensure that all IP requirements are met, such as IP addresses, subnet masks, and any specific routing protocol information.

### Environmental Requirements

---

See “System Specifications” on page 53 for complete environmental specifications.

Choose a location for the system that is dry, relatively dust free, well ventilated, and air conditioned. If you install equipment in a rack, be sure that the floor is capable of supporting the combined weight of the rack and the installed equipment. Place the system in a location with sufficient access to power and network cables.

Like other network devices, the system generates a significant amount of heat. You must provide a balanced environment so that the system performs properly and safely. See “System Specifications” on page 53 for acceptable ranges of temperature and humidity.

Be sure to allow enough space around the system for adequate ventilation. Inadequate ventilation can cause the system to overheat.



**CAUTION:** Do not block the air vents on the system. Otherwise, the system might overheat.

---

## Regulatory Compliances

---

See “System Specifications” on page 53 for a complete list of regulatory compliance requirements, including safety, EMC, and telecommunications.

## Safety Notices

---

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

### 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。

## Safety Guidelines

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



**WARNING:** The recommended maximum ambient temperature is 40° C (104° F). 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.

## Equipment Rack Requirements

When allocating equipment rack space, consider the following:

- Type of equipment racks recommended for the system
- Number of equipment racks required to hold your current system configuration
- Future expansion

Make sure that your distribution rack meets basic mechanical and space requirements and complies with conventional standards. In the United States, use the EIA-310-D Cabinets, Racks, Panels, and Associated Equipment, September 1992 standard.

## Mechanical Requirements

Follow these mechanical requirements for your rack:

- Select from the following rack options:
  - Two-post rack—A freestanding enclosed cabinet with two mounting posts in the front
  - Telco-type rack—Two adjacent mounting posts that you must secure to the floor or an overhead structure
  - Four-post rack—A freestanding open rack, either open or closed
- The rack must have at least two mounting posts.
- The distance between the mounting holes in the two posts must be 18.31 inches  $\pm$  .063 inch, as specified in EIA-310-D.
- An optional mounting kit is available for midchassis mounting. Contact your Juniper Networks sales representative for more information.

### **Space Requirements**

If you use an enclosed rack for the system, ensure that there is a minimum of 3 inches of clearance between the inner side wall and the system. This clearance space ensures adequate air flow.

### **Proper Rack Installation**

To confirm proper equipment rack installation, verify the following:

- Racks are installed and electrically grounded according to manufacturer instructions.
- Equipment racks are anchored to the floor and, when possible, anchored to the ceiling as well.
- Equipment rack installations comply with applicable local, state, and national codes.

### **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.

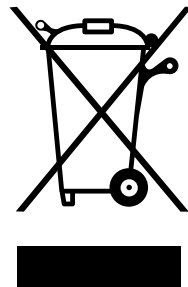
## Product Reclamation and Recycling Program

---

Juniper Networks is committed to environmentally responsible behavior. As part of this commitment, we continually work to comply with environmental standards such as the European Union's *Waste Electrical and Electronic Equipment* (WEEE) Directive and *Restriction of Hazardous Substances* (RoHS) Directive.

These directives and other similar regulations from countries outside the European Union regulate electronic waste management and the reduction or elimination of specific hazardous materials in electronic products. The WEEE Directive requires electrical and electronics manufacturers to provide mechanisms for the recycling and reuse of their products. The RoHS Directive restricts the use of certain substances that are commonly found in electronic products today. Restricted substances include heavy metals, including lead, and polybrominated materials. The RoHS Directive, with some exemptions, applies to all electrical and electronic equipment.

In accordance with Article 11(2) of Directive 2002/96/EC (WEEE), products put on the market after 13 August 2005 are marked with the following symbol or include it in their documentation: a crossed-out wheeled waste bin with a bar beneath.



Juniper Networks provides recycling support for our equipment worldwide to comply with the WEEE Directive. For recycling information, go to <http://www.juniper.net/environmental>, and indicate the type of Juniper Networks equipment that you wish to dispose of and the country where it is currently located, or contact your Juniper Networks account representative.

Products returned through our reclamation process are recycled, recovered, or disposed of in a responsible manner. Our packaging is designed to be recycled and should be handled in accordance with your local recycling policies.

## Hardware Compliance

---

C Series Controllers meet the hardware compliance requirements in this topic.

### ***Federal Communications Commission (FCC) Statement***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This equipment is designed for use with properly shielded and terminated cables. Refer to the installation sections of this manual before operation.

Reference: CFR 47, Part 15J, Sect 15.105 April 18, 1989

**Caution:** Changes or Modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### ***FCC Requirements for Consumer Products***

This equipment complies with FCC rules, Part 68. On the back side of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. If requested, provide this information to your telephone company.

If this equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

If you experience trouble with this equipment, please contact the manufacturer for warranty/repair information. The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

### ***Food and Drug Administration, Center for Devices and Radiological Health***

This equipment complies with 21 CFR 1040.10 and 1040.11 for the safe use of lasers.



### **Canadian Department of Communications Radio Interference Regulations**

This Class B (or Class A, if so indicated on the registration label) digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

### **Règlement sur le brouillage radioélectrique du ministère des communications**

Cet appareil numérique de la Classe B (ou Classe A, si ainsi indiqué sur l'étiquette d'enregistrement) respecte toutes les exigences du Règlement sur le Matériel Brouilleur du Canada.

### **Industry Canada Notice CS-03**

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**Caution:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

**Notice:** The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

### **Avis CS-03 d'Industrie Canada**

L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur. Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchement de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

**Attention:** Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

**Avis:** Veuillez prendre note que pour tout appareillage supportant des lignes de type “loopstart,” l'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5. Le REN figure sur l'étiquette “FCC Rules Part 68” située sur le support du module ou à l'arrière de l'unité.

### ***D.O.C. Explanatory Notes: Equipment Attachment Limitations***

The Canadian Department of Communications label identifies certified equipment. This certification meets certain telecommunication network protective, operational and safety requirements. The department does not guarantee the equipment will operate to the users satisfaction.

Before installing the equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**Caution:** Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

### **Notes explicatives du ministère des Communications: limites visant les accessoires**

L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service d'entretien canadien désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchement de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

**Attention:** Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

### **EC Declaration of Conformity**

The EC Declaration of Conformity is available in “Declaration of Conformity” on page 89.

### **Voluntary Control Council for Interference (VCCI) Statement for Japan**

この装置は、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。 VCCI-A

The preceding translates as:

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



## Chapter 13

# Contacting Customer Support and Returning Hardware

See the Juniper Networks Web site for complete customer service information:

- <http://www.juniper.net/support/guidelines.html>

Topics in this chapter include:

- Contacting Customer Support on page 85
- Return Procedure on page 85
- Locating Component Serial Numbers on page 86
- Information You Might Need to Supply to JTAC on page 86
- Tools and Parts Required on page 87
- Returning Products for Repair or Replacement on page 87

## Contacting Customer Support

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For your convenience, we provide multiple options for requesting and receiving technical support from the Juniper Networks Technical Assistance Center (JTAC):

- By the Web using Juniper Networks, Inc. Case Manager:  
<https://www.juniper.net/cm/index.jsp>
- By telephone:
  - From the US, Canada, and Mexico at 1-888-314-JTAC
  - From all other locations at 408-745-9500

## Return Procedure

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When you need to return a component, follow this procedure:

1. Determine the part number and serial number of the component. For instructions, see “Locating Component Serial Numbers” on page 86.
2. Obtain a Return Materials Authorization (RMA) number from the JTAC. See “Information You Might Need to Supply to JTAC” on page 86.

Provide the following information in your e-mail message or during the telephone call:

- Part number and serial number of the component
- Your name, organization name, telephone number, and fax number
- Shipping address for the replacement component, including contact name and phone number
- Description of the failure

The support representative validates your request and issues an RMA number for return of the component.

3. Pack the component for shipment, performing the procedure described in “Returning Products for Repair or Replacement” on page 87.

## Locating Component Serial Numbers

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Before contacting Juniper Networks to request a 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.

## Information You Might Need to Supply to JTAC

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

- Priority level
- Indication of what activity was being performed on the system when the problem occurred
- Problem detail and configuration data, obtained by this command:
  - show configuration
  - show system configuration

When a new request for technical support is submitted, the JTAC engineer:

1. Opens a case and assigns a number.
2. Begins troubleshooting, diagnostics, and problem replication (if appropriate).
3. Provides you with periodic updates on problem status and escalates the problem as appropriate according to escalation management guidelines.
4. Closes the case when you agree that the problem has been resolved.

## Tools and Parts Required

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To remove components from the chassis or the chassis from a rack before you return the chassis or components for repair or replacement, you need the following tools and parts:

- Mechanical lift, if available
- 3/8-inch wrench or nut driver
- Electrostatic bag or antistatic mat
- Electrostatic discharge (ESD) grounding device
- Flat-blade (—) screwdriver
- Phillips (+) screwdrivers, numbers 1 and 2
- Plastic boots or other protective cover for fiber-optic connectors
- Wire cutters

## Returning Products for Repair or Replacement

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In the event of a hardware failure, please contact Juniper Networks to obtain a Return Material Authorization (RMA) number. This number is necessary to ensure proper tracking and handling of returned material at the factory. Do not return any hardware until you have received an RMA. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the shipper via collect freight.

## *Packing Instructions for Returning a Chassis*

If possible, use the original shipping crate, pallet, and packing materials in which the chassis was originally shipped. If these materials are unavailable, use comparable shipping material, or contact your Juniper Networks representative for information on approved packaging material.

To pack the chassis for shipment:

1. Ground yourself by using an antistatic wrist strap or other device.
2. Issue the proper shutdown commands to halt your system.
3. Power the system down by pressing the PWR button.
4. Remove all cables from the chassis.
5. Remove the chassis from the rack.
6. Pack the chassis securely in a proper shipping container, covering the chassis with an ESD bag and placing packing foam on top of and around the chassis.





## Chapter 14

# Declaration of Conformity

This chapter contains the following topics:

- Declaration of Conformity – C2000 Controller on page 89
- Declaration of Conformity – C4000 Controller on page 90

### Declaration of Conformity – C2000 Controller

---

#### Declaration of Conformity

Juniper Networks, Inc.  
10 Technology Park Drive  
Westford, Massachusetts 01886 USA

declares that under our sole responsibility the product(s)

**Server**  
**Model C2000**

is in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

**Low Voltage Directive 73/23/EEC**  
**EMC Directive 89/336/EEC**

and that the following harmonized standards have been applied:

EN 60950-1:2000 + A1 1  
EN 60825-1:1994 + A1 + A2  
EN 300 386 V1.3.3:2005  
EN 55024:1998 + A1 + A2  
EN 55022:1998 + A1 (2000) + A2 (2003) Class A

Place  
Westford, MA

Signature  
Susanne Delisle

Date  
07/24/2007

## Declaration of Conformity – C4000 Controller

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### Declaration of Conformity

Juniper Networks, Inc.  
10 Technology Park Drive  
Westford, Massachusetts 01886 USA

declares that under our sole responsibility the product(s)

**Server**  
**Model C4000**

is in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

**Low Voltage Directive 73/23/EEC**  
**EMC Directive 89/336/EEC**

and that the following harmonized standards have been applied:

EN 60950-1:2000 + A1 1  
EN 60825-1:1994 + A1 + A2  
EN 55024:1998 + A1 + A2  
EN 61000-3-2, EN 61000-3-3  
EN 55022:1998 + A1 (2000) + A2 (2003) Class A

Place  
Westford, MA

Signature  
Susanne Delisle

Date  
07/24/2007

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## **Part 4**

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