



C-series Platforms

C2000 and C4000 Hardware Guide

Release 1.0.x

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About This Guide

This preface provides the following guidelines for using the *Hardware Guide*:

- Objectives on page ix
- Audience on page ix
- Documentation Conventions on page x
- Related Juniper Networks Documentation on page xi
- Obtaining Documentation on page xiii
- Documentation Feedback on page xiii
- Requesting Support on page xiv

Objectives

This guide provides the information you need to install, start, maintain, and troubleshoot a C-series Controller.



NOTE: If the information in the latest *SRC Release Notes* differs from the information in this guide, follow the *SRC Release Notes*.

Audience

This guide is intended for experienced system and network specialists working with JUNOSe routers and JUNOS routing platforms in an Internet access environment. We assume that readers know how to use the routing platforms, directories, and RADIUS servers that they will deploy in their SRC networks. For users who deploy the SRC software on a Solaris platform, we also assume that readers are familiar with the Lightweight Directory Access Protocol (LDAP) and the UNIX operating system.

If you are using the SRC software in a cable network environment, we assume that you are familiar with the PacketCable Multimedia Specification (PCMM) as defined by Cable Television Laboratories, Inc. (CableLabs) and with the Data-over-Cable Service Interface Specifications (DOCSIS) 1.1 protocol. We also assume that you are familiar with operating a multiple service operator (MSO) multimedia-managed IP network.

Documentation Conventions

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

Table 2: Text Conventions

Convention	Description	Examples
Bold typeface	<ul style="list-style-type: none"> ■ Represents keywords, scripts, and tools in text. ■ Represents a GUI element that the user selects, clicks, checks, or clears. 	<ul style="list-style-type: none"> ■ Specify the keyword exp-msg. ■ Run the install.sh script. ■ Use the pkgadd tool. ■ To cancel the configuration, click Cancel.
Bold sans serif typeface	Represents text that you must type.	<code>user@host# set cache-entry-age</code> <code>cache-entry-age</code>
Monospace sans serif typeface	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"> ■ Represents configuration statements. ■ Indicates SRC CLI commands and options in text. ■ Represents examples in procedures. ■ Represents URLs. 	<ul style="list-style-type: none"> ■ <code>system ldap server {</code> <code>stand-alone;</code> ■ Use the <code>request sae device failover</code> command with the <code>force</code> option. ■ <code>user@host# . . .</code> ■ http://www.juniper.net/techpubs/software/management/sdx/api-index.html

Table 2: Text Conventions (continued)

Convention	Description	Examples
<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	user@host# set local-address <i>local-address</i>
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.
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"> ■ Emphasizes words. ■ Identifies chapter, appendix, and book names. ■ Identifies distinguished names. ■ Identifies files, directories, and paths in text but not in command examples. 	<ul style="list-style-type: none"> ■ There are two levels of access: <i>user</i> and <i>privileged</i>. ■ <i>Chapter 2, Services</i>. ■ <i>o = Users, o = UMC</i> ■ The <i>/etc/default.properties</i> file
Backslash	At the end of a line, indicates that the text wraps to the next line.	Plugin.radiusAcct-1.class = \net.juniper.smgt.sae.plugin\RADIUSTrackingPluginEvent
Words separated by the symbol	Represent a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable may be either optional or required.)	diagnostic line

Related Juniper Networks Documentation

With each SRC software release, we provide the *SRC Documentation CD*, which contains the documentation described in Table 3 on page xii.

With each SRC Application Library release, we provide the *SRC Application Library CD*. This CD contains both the software applications and the *SRC Application Library Guide*.

The C-Web interface, which is based on the J-Web interface, is available for monitoring the C-series platforms and the SRC software. For general information about the J-Web interface, see the *J-Web Interface User Guide*.

A complete list of abbreviations used in this document set, along with their spelled-out terms, is provided in the *SRC Getting Started Guide*.

Table 3: Juniper Networks C-series and SRC Technical Publications

Document	Description
Core Documentation Set	
<i>C-series Hardware Guide</i>	Describes the hardware platforms and how to install, maintain, replace, and troubleshoot them. The guide also includes specifications.
<i>SRC-PE Getting Started Guide</i>	Describes the SRC software and explains how to set up an initial configuration and manage a C-series platform. The guide describes how to set up and start the SRC CLI and C-Web, as well as other SRC configurations. It provides information about setting up an initial SRC configuration on a Solaris platform. The guide also describes how to upgrade the SRC software and how to use the SRC configuration tools. It includes reference material for the SRC documentation.
<i>SRC-PE CLI User Guide</i>	Describes how to use the SRC CLI, configure and monitor the platform with the CLI, and control the CLI environment. The guide also describes how to manage SRC components with the CLI.
<i>SRC-PE Network Guide: SAE, Juniper Networks Routers, and NIC</i>	Describes how to use and configure the SAE and the NIC. This guide also provides detailed information for using JUNOS routers and JUNOS routing platforms in the SRC network.
<i>SRC-PE Integration Guide: Network Devices, Directories, and RADIUS Servers</i>	Describes how to integrate external components—network devices, directories, and RADIUS servers—into the SRC network. The guide provides detailed information about integrating specific models of the external components.
<i>SRC-PE Services and Policies Guide</i>	Describes how to work with services and policies. The guide provides an overview, configuration procedures, and management information. The guide also provides information about the SRC tools for configuring policies.
<i>SRC-PE Subscribers and Subscriptions Guide</i>	Describes how to work with residential and enterprise subscribers and subscriptions. The guide provides an overview, configuration procedures, and management information. This guide also provides information about the sample residential portals and enterprise service portals, including the Enterprise Manager Portal.
<i>SRC-PE Monitoring and Troubleshooting Guide</i>	Describes how to use logging, the SNMP agent, the SRC CLI, and the C-Web interface to monitor and troubleshoot SRC components. This guide also describes the SNMP traps.
<i>SRC-PE Solutions Guide</i>	Provides high-level instructions for SRC implementations. The guide documents the following scenarios: managing QoS services on JUNOS routers; managing subscribers in a wireless roaming environment; providing voice over IP (VoIP) services; integrating the SRC software in a PCMM environment, including the use of the Juniper Policy Server (JPS); mirroring subscriber traffic on JUNOS routers; demonstrating network resource management features in a sample IP television (IPTV) application; and demonstrating the integration of prepaid services in a sample application.
<i>SRC-PE CLI Command Reference, Volume 1</i> <i>SRC-PE CLI Command Reference, Volume 2</i>	Together provide information about command and statement syntax; descriptions of commands, configuration statements, and options; editing level of statement options; and a history of when a command was added to the documentation.

Table 3: Juniper Networks C-series and SRC Technical Publications (continued)

Document	Description
<i>SRC-PE Comprehensive Index</i>	Provides a complete index of the SRC guides, excluding the <i>C-series Hardware Guide</i> and the <i>SRC-PE Command Reference</i> .
<i>J-Web User Interface Guide</i>	Provides general information about the J-Web interface.
Application Library	
<i>SRC Application Library Guide</i>	Describes how to install and work with applications that you can use to extend the capabilities of the SRC software. The guide documents the following applications: SRC-SG (SOAP Gateway) Web applications, applications to integrate the Juniper Networks Intrusion Detection and Protection (IDP) software into an SRC-managed environment, an application to provide endpoint security by integrating Juniper Networks Instant Virtual Extranet (IVE) Host Checker, a traffic-mirroring Web application, an application to integrate IP address managers with the SAE, an application to provide tracking and QoS control at the application level by integrating the SRC software with the Ellacoya deep packet inspection (DPI) platform, an application to control volume usage, and the SRC-ACP (Admission Control Plug-In) application.
Release Notes	
<i>SRC-PE Release Notes</i>	In the <i>Release Notes</i> , you will find the latest information about features, changes, known problems, resolved problems, supported platforms and network devices (such as Juniper Networks routers and CMTS devices), and third-party software. If the information in the <i>Release Notes</i> differs from the information found in the documentation set, follow the <i>Release Notes</i> . Release notes are included in the corresponding software distribution and are available on the Web.
<i>SRC Application Library Release Notes</i>	

Obtaining Documentation

To obtain the most current version of all Juniper Networks technical documentation, see the products documentation page on the Juniper Networks Web site at <http://www.juniper.net/>.

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Part 1

Product Overview

- C-series Platform Overview on page 3

Chapter 1

C-series Platform Overview

This chapter provides introductory information about the C-series platform. It contains the following topics:

- System Description on page 3
- C-series Platform Models on page 3
- C-series Model Components on page 5
- Network Management Tools on page 6

System Description

The C-series platform 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 platform 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 Platform Models

Two C-series platform 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 4 on page 4.)

Table 4: C-series Model Differences

Model	Service Session Licenses	Concurrent Subscribers
C2000	50,000	200,000
C4000	100,000	500,000



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

Figure 1: C2000, Front View

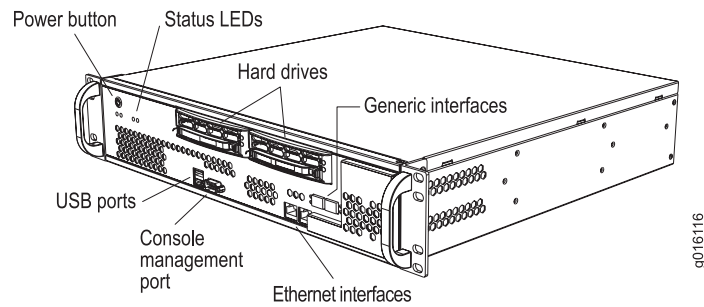


Figure 2: C2000, Rear View

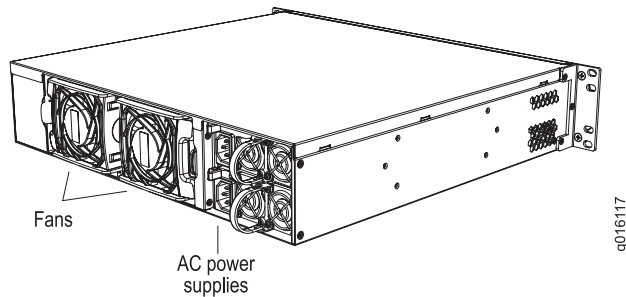


Figure 3: C4000, Front View

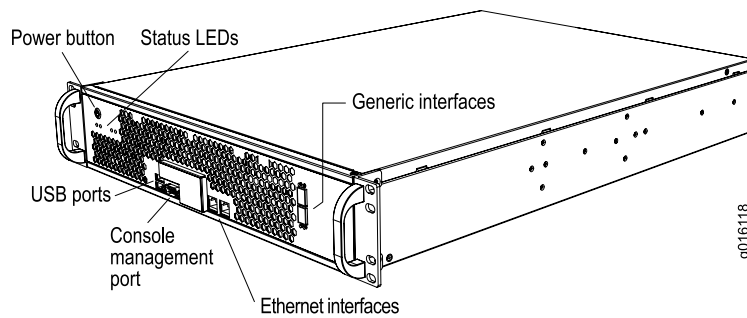
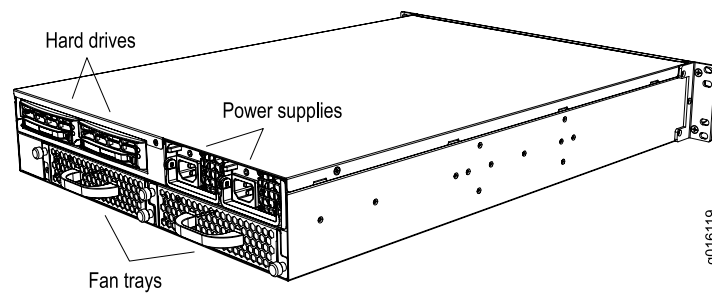


Figure 4: C4000, Rear View

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.

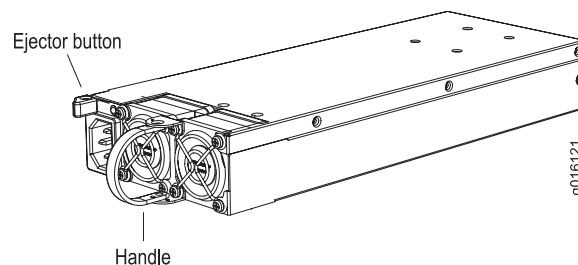
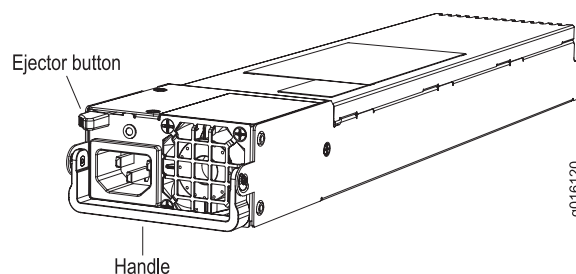
Figure 5: C2000 Power Supply

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.
- 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 platform. 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 Platform on page 11
- Installing and Cabling the C-series Platform on page 13
- Powering Up the C-series Platform on page 19
- Setting the Initial Configuration on page 21

Chapter 2

Unpacking and Inspecting the C-series Platform

This chapter reviews shipping contents and unpacking procedures for the C-series platform. It contains the following topics:

- Before You Begin on page 11
- Unpacking the Units on page 12
- Inspecting System Components and Accessories on page 12
- 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

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 53 for complete contact information.

The Next Step

- To familiarize yourself with the electrical, environmental, and other guidelines and requirements for installing the system, see *Installation Guidelines and Requirements* on page 43.
- If you are familiar with these guidelines and requirements, see *Installing and Cabling the C-series Platform* on page 13.

Chapter 3

Installing and Cabling the C-series Platform

This chapter describes how to install the C-series platform and attach cables. It contains the following topics:

- 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 18

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 44 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 46 for rack information.

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. With one person standing on the left side of the chassis and another standing on the right side, lift the unit into the rack.
2. 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.
3. 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.
4. 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 43.)
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 35 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 and Figure 9):

- 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 Power

After you have correctly cabled the system, you can then attach the power cord. See Figure 8 and Figure 10. See “System Specifications” on page 35 for the power requirements for the system.

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

Figure 7: C2000, Front View

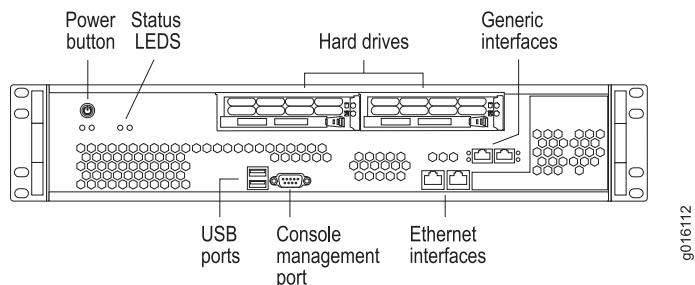


Figure 8: C2000, Rear View

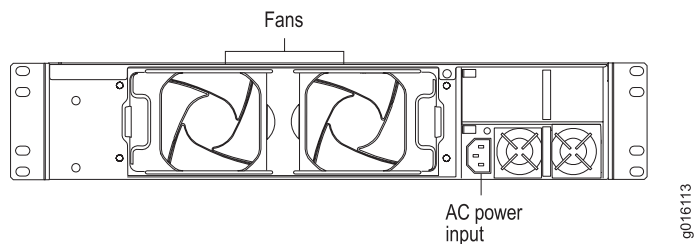


Figure 9: C4000, Front View

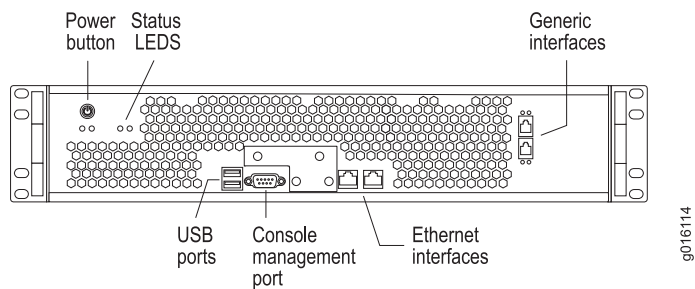
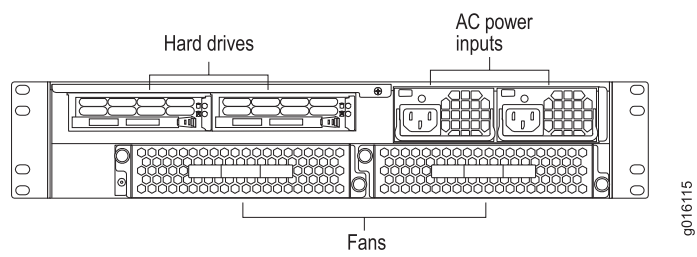


Figure 10: C4000, Rear View



The Next Step

After you finish installing and cabling the system:

- See [Powering Up the C-series Platform](#) on page 19.

Chapter 4

Powering Up the C-series Platform

This chapter describes how to power up the C-series platform. It contains the following topics:

- Powering Up on page 19
- Status LEDs on page 20
- 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 35.



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 5 on page 20 are used on both models.

Table 5: 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 platform after powering it on. For basic information on the management of the system, see the *SRC-PE Getting Started Guide*.

This chapter contains the following topics:

- 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 26
- 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 7.0 [B.7.0.0-12]
localhost login:root
```

3. Enter the password.

```
localhost password:password
— SRC CLI 7.0 build CLI.B.7.0.0.012
(c) 2005-2007 Juniper Networks Inc.
root@localhost>
```

You are now logged in as root user.

Configuring the Juniper Networks Database

Each C-series platform 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 platforms, 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 Starting 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 Starting Guide, Chapter 7, Configuring Remote Access to an SRC Platform*.

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 Starting Guide, Chapter 7, Configuring Remote Access to a C-series Platform*.

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 platform 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
- System Specifications on page 35
- Managing RAID Disks on a C-series Platform on page 39
- Installation Guidelines and Requirements on page 43
- Contacting Customer Support and Returning Hardware on page 53
- Declaration of Conformity on page 57

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.

This chapter contains the following sections:

- Required Tools and Items on page 31
- Storing Modules and Components on page 32
- Cleaning the System on page 32
- Removing and Installing a Fan on page 32
- Removing and Installing a Power Supply Module on page 33
- Removing and Installing a Hard Drive on page 34

Required Tools and Items

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

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



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

Follow these guidelines for storing components:

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

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.

Removing and Installing a Fan

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.



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.

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.



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 a Power Supply Module



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

To remove a power supply module:

1. Unplug the power cord.

- Slide the locking tab (ejector button) to the left to release the module. See Figure 11 and Figure 12.
- Hold the tab to the left, and using the handle, slowly pull the power supply module out.

To install a power supply module:

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

Figure 11: C2000 Power Supply

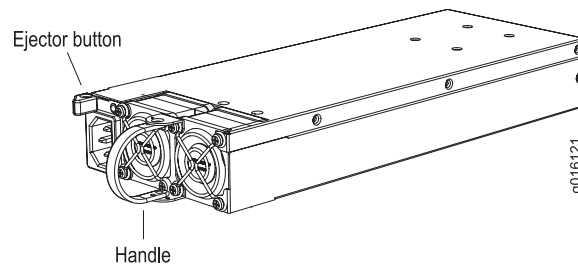
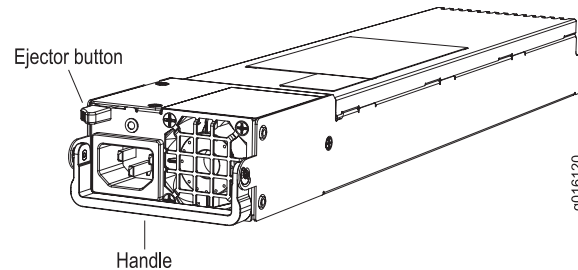


Figure 12: C4000 Power Supply



Removing and Installing a Hard Drive



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

To remove a hard drive:

- Slide the locking tab in the bottom-right corner to the right to release the hard drive.
- 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

System Specifications

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

- C2000 Model Specifications on page 35
- C4000 Model Specifications on page 36

C2000 Model Specifications

Table 6: C2000 Model Specifications

Category	Specification
Weight	33 lb (15 kg)
Dimensions	3.5 (H) x 16.7 (W) x 16.2 (D) inches 8.89 (H) x 42.42 (W) x 41.15 (D) cm
Environmental Requirements	
Temperature	<ul style="list-style-type: none">■ Operating: 50° to 104° F (10° to 40° C)■ Storage: -40° to 158° F (-40° ° to 70° C)
Relative humidity	<ul style="list-style-type: none">■ Operating: 8% to 90% (noncondensing)■ Storage: 5% to 95% (noncondensing)
Heat Dissipation	500 W, 1706 BTU/hour maximum
AC Input	
Power required	100-240 VAC @ -5 A
AC line frequency	50-60 Hz
Power	500 W
Space Requirements	<ul style="list-style-type: none">■ 3 feet (90 cm) behind system or rack.■ Do not block air vents on front or back of the system.
Safety Agency Certification	<ul style="list-style-type: none">■ <i>Pending</i>

Table 6: C2000 Model Specifications (continued)

Category	Specification
Airflow	<ul style="list-style-type: none"> ■ Air intake occurs in the front of the system. ■ Air is exhausted out of the rear of the system.
Electromagnetic Emissions Agency Certification	■ <i>Pending</i>

C4000 Model Specifications

Table 7: C4000 Model Specifications

Category	Specification
Weight	48 lb (22 kg)
Dimensions	3.5 (H) x 16.7 (W) x 24 (D) inches 8.89 (H) x 42.42 (W) x 60.96 (D) cm
Environmental Requirements	
Temperature	<ul style="list-style-type: none"> ■ Operating: 50° to 104° F (10° to 40° C) ■ Storage: -40° to 158° F (-40° ° to 70° C)
Relative humidity	<ul style="list-style-type: none"> ■ Operating: 8% to 90% (noncondensing) ■ Storage: 5% to 95% (noncondensing)
Ambient storage temperature	-40° ° to 158° F (-40° ° to 70° C), 95% relative humidity
Ambient storage humidity	5% to 95% (noncondensing)
Heat Dissipation	700 W, 2389 BTU/hour maximum
AC Input	
Power required	100-240 VAC @ -5 A
AC line frequency	50-60 Hz
Power	700 W
Space Requirements	<ul style="list-style-type: none"> ■ 3 feet (90 cm) behind system or rack. ■ Do not block air vents on or back of the system.
Airflow	<ul style="list-style-type: none"> ■ Air intake occurs in the front of the system. ■ Air is exhausted out of the rear of the system.
Safety Agency Certification	■ <i>Pending</i>

Table 7: C4000 Model Specifications *(continued)*

Category	Specification
Electromagnetic Emissions Agency Certification	■ <i>Pending</i>

Chapter 8

Managing RAID Disks on a C-series Platform

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

- C-series Platform Data Storage on page 39
- Managing Disks in a C-series Platform on page 40

C-series Platform Data Storage

A C-series platform 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 platform 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 platform:

- 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 Platform

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

Replacing a Disk

If a disk in the C-series platform fails, you can replace it while the other disk remains active.

To replace a disk:

1. Disable the disk.

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

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
```

C:ID:L	Device Type	Blocks	Bytes/Block	Usage	Shared	Rate
0:00:0	Disk	145226112	512	Initialized	NO	150
0:01:0	Disk	145226112	512	Initialized	NO	150

C:ID:L	Device	Smart Capable	Method of Informational Exceptions(MRIE)	Enable Control	Performance Enabled	Error Count
0:00:0	Y	Y	6	Y	N	0
0:01:0	Y	Y	6	Y	N	0

Controller Tasks

TaskId	Function	Done%	Container	State	Specific1	Specific2
100	Rebuild	0.3%	0	RUN	00000000	00000000

Reinitializing an Active Disk

You can reinitialize a disk that is already active in a C-series platform.

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 Platform

To view information about disks in the C-series platform:

- Enter the **show disk status** command.

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

C:ID:L	Device Type	Blocks	Bytes/Block	Usage	Shared	Rate
0:00:0	Disk	145226112	512	Initialized	NO	150
0:01:0	Disk	145226112	512	Initialized	NO	150

C:ID:L	Device	Smart Capable	Method of Informational Exceptions(MRIE)	Enable Control	Performance Enabled	Error Count
0:00:0	Y	6	Y	N	0	
0:01:0	Y	6	Y	N	0	

Controller Tasks

```
TaskId Function Done% Container State Specific1 Specific2
```

```
-----
No tasks currently running on the controller
```

Table 8: show disk status Output Fields

Field Name	Field Description
C:ID:L	C indicates the channel number, ID the device ID, and L the device logical number
Device Type	Type of device; disk
Blocks	Number of blocks available on the disk
Bytes/Block	Number of bytes for each block
Usage	Status of disk: <ul style="list-style-type: none"> ■ Detached—Not available for use ■ Initialized—Prepared for use with arrays ■ Not initialized—Not prepared for use with arrays ■ Offline—Present at system boot, but the disk was removed or failed ■ Unowned—The controller does not control the disk
Shared	Whether or not the disk is on a shared channel
Rate	Disk speed in megabytes per second
Smart Capable Device	Whether or not the device is enabled for Specifies if Self-Monitoring, Analysis and Reporting Technology (SMART)
Methods of Informational Exceptions (MIE)	List of MIE exceptions
Enable Exception Control	Whether or not SMART exception reporting is enabled
Performance Enabled	Whether or not performance is enabled
Error Count	Number of errors that SMART found on the disk
Controller Tasks	The No tasks currently running on controller message indicates that no tasks are running, including initialization.

Chapter 9

Installation Guidelines and Requirements

This chapter reviews preinstallation considerations such as electrical, environmental, and safety compliances for the C-series platforms. For complete system specifications, see “System Specifications” on page 35.

This chapter contains the following topics:

- Your Preinstallation Responsibilities on page 43
- Environmental Requirements on page 44
- Regulatory Compliances on page 44
- Safety Guidelines on page 45
- Equipment Rack Requirements on page 46
- Cabling Recommendations on page 47
- Product Reclamation and Recycling Program on page 48
- Hardware Compliance on page 49

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 35.
- Verify that the site meets all environment specifications. See “Environmental Requirements” on page 44 and “System Specifications” on page 35.
- Verify that the cables you plan to use meet the specifications, and review the cabling recommendations. See Cabling Recommendations on page 47.
- 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 35 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 35 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 35 for a complete list of regulatory compliance requirements, including safety, EMC, and telecommunications.

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.

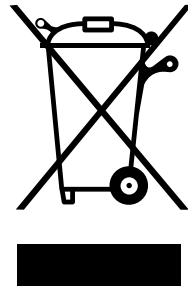
For additional cable recommendations, consult the document GR-63–CORE: Network Equipment Building System (NEBS) Requirements: Physical Protection, Issue 2, April 2002.

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 platforms 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.

Réglement 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 57.

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 10

Contacting Customer Support and Returning Hardware

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

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

This chapter contains the following topics:

- Contacting Customer Support on page 53
- Return Procedure on page 53
- Locating Component Serial Numbers on page 54
- Information You Might Need to Supply to JTAC on page 54
- Tools and Parts Required on page 55
- Returning Products for Repair or Replacement on page 55

Contacting Customer Support

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

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 54.

2. Obtain a Return Materials Authorization (RMA) number from the JTAC. See “Information You Might Need to Supply to JTAC” on page 54.

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 55.

Locating Component Serial Numbers

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

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

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

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 11

Declaration of Conformity

This chapter contains the following sections:

- Declaration of Conformity on page 57

Declaration of Conformity

Pending

Part 4

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- Index on page 61

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