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**Documentation and Release Notes**

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at [https://www.juniper.net/documentation/](https://www.juniper.net/documentation/)

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at [https://www.juniper.net/books](https://www.juniper.net/books).

**Documentation Conventions**

Table 1 on page xiv defines notice icons used in this guide.
Table 1: Notice Icons

<table>
<thead>
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<th>Icon</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![i]</td>
<td>Informational note</td>
<td>Indicates important features or instructions.</td>
</tr>
<tr>
<td>![!]</td>
<td>Caution</td>
<td>Indicates a situation that might result in loss of data or hardware damage.</td>
</tr>
<tr>
<td>![A]</td>
<td>Warning</td>
<td>Alerts you to the risk of personal injury or death.</td>
</tr>
<tr>
<td>![L]</td>
<td>Laser warning</td>
<td>Alerts you to the risk of personal injury from a laser.</td>
</tr>
<tr>
<td>![L]</td>
<td>Tip</td>
<td>Indicates helpful information.</td>
</tr>
<tr>
<td>![L]</td>
<td>Best practice</td>
<td>Alerts you to a recommended use or implementation.</td>
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Table 2 on page xiv defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

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<th>Description</th>
<th>Examples</th>
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<tr>
<td><strong>Bold text like this</strong></td>
<td>Represents text that you type.</td>
<td>To enter configuration mode, type the <code>configure</code> command: user@host&gt; configure</td>
</tr>
<tr>
<td><strong>Fixed-width text like this</strong></td>
<td>Represents output that appears on the terminal screen.</td>
<td>user@host&gt; show chassis alarms No alarms currently active</td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.</td>
<td>• A policy term is a named structure that defines match conditions and actions. • <em>Junos OS CLI User Guide</em> • RFC 1997, <em>BGP Communities Attribute</em></td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>Represents variables (options for which you substitute a value) in commands or configuration statements.</td>
<td>Configure the machine’s domain name: [edit] root@# set system domain-name domain-name</td>
</tr>
</tbody>
</table>
### Table 2: Text and Syntax Conventions (continued)

<table>
<thead>
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<th>Convention</th>
<th>Description</th>
<th>Examples</th>
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</table>
| Text like this        | Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components. | • To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.  
                           |                                                                                                                                  | • The console port is labeled CONSOLE                                                   |
|                       |                                                                                                                                |                                                                                           |
| < > (angle brackets)  | Encloses optional keywords or variables.                                                                                     | stub <default-metric metric >;                                                             |
|                       |                                                                                                                                |                                                                                           |
| | (pipe symbol)        | Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity. | broadcast | multicast (string1 | string2 | string3) |
|                       |                                                                                                                                |                                                                                           |
| # (pound sign)        | Indicates a comment specified on the same line as the configuration statement to which it applies.                            | rsvp [ # Required for dynamic MPLS only                                                   |
|                       |                                                                                                                                |                                                                                           |
| [ ] (square brackets) | Encloses a variable for which you can substitute one or more values.                                                          | community name members [ community-ids ]                                                  |
|                       |                                                                                                                                |                                                                                           |
| Indentation and braces ( { } ) | Identifies a level in the configuration hierarchy.                                                                            | [edit] routing-options { static { nexthop address; retain; } }                          |
|                       |                                                                                                                                |                                                                                           |
| ; (semicolon)         | Identifies a leaf statement at a configuration hierarchy level.                                                                |                                                                                           |
|                       |                                                                                                                                |                                                                                           |
| **GUI Conventions**   |                                                                                                                                 |                                                                                           |
| **Bold text like this** | Represents graphical user interface (GUI) items you click or select.                                                            |                                                                                                                                                  |
|                       |                                                                                                                                | • In the Logical Interfaces box, select All Interfaces.  
                           |                                                                                                                                  | • To cancel the configuration, click Cancel.                                               |
|                       |                                                                                                                                |                                                                                           |
| > (bold right angle bracket) | Separates levels in a hierarchy of menu selections.                                                                          | In the configuration editor hierarchy, select Protocols>Osfp.                            |

### Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- **Online feedback rating system**—On any page of the Juniper Networks TechLibrary site at [https://www.juniper.net/documentation/index.html](https://www.juniper.net/documentation/index.html), simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at [https://www.juniper.net/documentation/feedback/](https://www.juniper.net/documentation/feedback/).
Requesting Technical Support

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

- **Product warranties**—For product warranty information, visit [https://www.juniper.net/support/warranty/](https://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**: [https://www.juniper.net/customers/support/](https://www.juniper.net/customers/support/)
- **Search for known bugs**: [https://prsearch.juniper.net/](https://prsearch.juniper.net/)
- **Find product documentation**: [https://www.juniper.net/documentation/](https://www.juniper.net/documentation/)
- **Find solutions and answer questions using our Knowledge Base**: [https://kb.juniper.net/](https://kb.juniper.net/)
- **Download the latest versions of software and review release notes**: [https://www.juniper.net/customers/csc/software/](https://www.juniper.net/customers/csc/software/)
- **Search technical bulletins for relevant hardware and software notifications**: [https://kb.juniper.net/InfoCenter/](https://kb.juniper.net/InfoCenter/)
- **Join and participate in the Juniper Networks Community Forum**: [https://www.juniper.net/company/communities/](https://www.juniper.net/company/communities/)
- **Open a case online in the CSC Case Management tool**: [https://www.juniper.net/cm/](https://www.juniper.net/cm/)

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

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 [https://www.juniper.net/cm/](https://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 https://www.juniper.net/support/requesting-support.html.
PART 1

Overview

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• Interface Module Description on page 27
• Cooling System Description on page 31
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CHAPTER 1

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- SRX650 Services Gateway Features and Functions on page 3
- SRX650 Services Gateway Software Features and Licenses on page 4
- SRX650 Services Gateway Power over Ethernet Overview on page 8
- Accessing the SRX650 Services Gateway on page 10

SRX650 Services Gateway Description

The SRX650 is a mid-range dynamic services gateway that consolidates network infrastructure and security applications for regional offices, large branch offices, and small to medium enterprises. The services gateway provides cost-effective, scalable integration of routing, security, and other mid-range applications for these sites.

The SRX650 Services Gateway has a modular 2U chassis that fits a 19-inch rack with a depth of approximately 18.1 inches. It contains a rear-pluggable Services and Routing Engine (SRE) module that provides robust performance for mid-range applications, particularly routing and security services.

Related Documentation
- SRX650 Services Gateway Chassis on page 17
- Accessing the SRX650 Services Gateway on page 10
- SRX650 Services Gateway Software Features and Licenses on page 4

SRX650 Services Gateway Features and Functions

The SRX650 Services Gateway provides the following features:

- Symmetric Multiprocessing (SMP)-based data forwarding.
- Hardware-based control and data plane separation.
- Four on-board 10/100/1000Base-T Gigabit Ethernet ports.
- A Services and Routing Engine (SRE) with 2 GB DRAM memory configuration, which contains the management ports (console and USB) for the services gateway.
• Support for dual AC and DC power supplies with a redundant configuration in the chassis. The AC and DC power supplies are hot-swappable. The following power supplies are supported:
  • 645 W AC power supply with or without Power over Ethernet (PoE) support
  • 645 W DC power supply with or without PoE support

• Support for 2 GB CompactFlash (CF) storage devices. The SRE contains a hot-pluggable CF storage device used to upload and download files, and the chassis contains a CF storage device used to store the operating system. The services gateway supports the following CF storage devices:
  • STEC 2 GB
  • Wintec 2 GB

• Junos support for advanced security and routing services on the SRE.

• The SRX650 Services Gateway supports Gigabit-Backplane Physical Interface Modules (GPIMs). For more details about the supported GPIMs, see the *SRX Series Services Gateway for the Branch Physical Interface Modules Hardware Guide*.

### Related Documentation
- SRX650 Services Gateway Description on page 3
- Accessing the SRX650 Services Gateway on page 10
- SRX650 Services Gateway Software Features and Licenses on page 4
- SRX650 Services Gateway Chassis on page 17

### SRX650 Services Gateway Software Features and Licenses

The services gateway provides the software features listed in Table 3 on page 5.

NOTE: Some software features require the purchase of a separate license.

For information about features that require a license on this services gateway, see the *Installation and Upgrade Guide for Security Devices*.
### Table 3: Software Features and Licenses

<table>
<thead>
<tr>
<th>Feature Category</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routing</strong></td>
<td><strong>OSPF</strong></td>
</tr>
<tr>
<td></td>
<td><strong>BGP</strong></td>
</tr>
<tr>
<td></td>
<td>Routing Information Protocol version 1 (RIPv1) and version 2 (RIPv2)</td>
</tr>
<tr>
<td></td>
<td>Static routes</td>
</tr>
<tr>
<td></td>
<td>Intermediate System-to-Intermediate System (IS-IS)</td>
</tr>
<tr>
<td></td>
<td><strong>Connectionless Network Service (CLNS):</strong></td>
</tr>
<tr>
<td></td>
<td>• End System-to-Intermediate System (ES-IS) protocol</td>
</tr>
<tr>
<td></td>
<td>• IS-IS extensions</td>
</tr>
<tr>
<td></td>
<td>• BGP extensions</td>
</tr>
<tr>
<td></td>
<td>• Static routes</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> CLNS is available only in packet-based mode.</td>
</tr>
<tr>
<td><strong>MPLS:</strong></td>
<td><strong>Layer 2 and Layer 3 virtual private networks (VPNs)</strong></td>
</tr>
<tr>
<td></td>
<td>• VPN routing and forwarding (VRF) table labels</td>
</tr>
<tr>
<td></td>
<td>• Traffic engineering protocols such as LDP and RSVP</td>
</tr>
<tr>
<td></td>
<td>• Virtual private LAN service (VPLS)</td>
</tr>
<tr>
<td></td>
<td>• Multicast VLAN</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> MPLS is available in both packet-based mode and selective packet mode.</td>
</tr>
<tr>
<td><strong>Internet protocols</strong></td>
<td><strong>IPv4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>IPv6 routing and forwarding</strong></td>
</tr>
<tr>
<td><strong>IP address management</strong></td>
<td><strong>Static addresses</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Dynamic Host Configuration Protocol (DHCP) 8</strong></td>
</tr>
<tr>
<td>Feature Category</td>
<td>Feature</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| Encapsulation    | Ethernet:  
  • Media access control (MAC) encapsulation  
  • 802.1p tagging  
  • Point-to-Point Protocol over Ethernet (PPPoE)  
  • Circuit cross-connect (CCC)  
  • Translational cross-connect (TCC) |
<p>|                  | Synchronous Point-to-Point Protocol (PPP) |
|                  | Frame Relay |
|                  | High-Level Data Link Control (HDLC) |
|                  | 802.1Q filtering and forwarding |
|                  | Multilink Frame Relay (MLFR) |
|                  | Multilink PPP |
| Ethernet switching | Line-rate Ethernet switching provided by XPIMs, including support for VLANs, spanning tree, link aggregation, and authentication |</p>
<table>
<thead>
<tr>
<th>Feature Category</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>IPsec VPN for site-to-site or remote access encrypted tunneling</td>
</tr>
<tr>
<td></td>
<td>Antivirus filtering, including full antivirus file-based scanning or Express-AV packet-based scanning</td>
</tr>
<tr>
<td></td>
<td>Antispam and anti-phishing filtering</td>
</tr>
<tr>
<td></td>
<td>Web filtering</td>
</tr>
<tr>
<td></td>
<td>Content filtering based on file types and types of files within HTTP and HTTPS</td>
</tr>
<tr>
<td></td>
<td>Unified threat management (UTM)</td>
</tr>
<tr>
<td></td>
<td>Network attack detection</td>
</tr>
<tr>
<td></td>
<td>Denial of service (DoS) and distributed denial of service (DDoS) protection</td>
</tr>
<tr>
<td></td>
<td>Generic routing encapsulation (GRE), IP-over-IP, and IP Security (IPsec) tunnels</td>
</tr>
<tr>
<td></td>
<td>Advanced Encryption Standard (AES) 128-bit, 192-bit, and 256-bit</td>
</tr>
<tr>
<td></td>
<td>56-bit Data Encryption Standard (DES) and 168-bit 3DES encryption</td>
</tr>
<tr>
<td></td>
<td>MD5 and Secure Hash Algorithm 1 (SHA-1) authentication</td>
</tr>
<tr>
<td></td>
<td>Stateful firewall and stateless packet filters</td>
</tr>
<tr>
<td></td>
<td>Network Address Translation (NAT)</td>
</tr>
<tr>
<td>System management</td>
<td>Junos XML protocol XML application programming interface (API)</td>
</tr>
<tr>
<td></td>
<td>The J-Web browser interface—For services gateway configuration and management</td>
</tr>
<tr>
<td></td>
<td>Junos OS command-line interface (CLI)—For services gateway configuration and management through the console through Telnet, or SSH</td>
</tr>
<tr>
<td></td>
<td>Simple Network Management Protocol version 1 (SNMPv1), SNMPv2, and SNMPv3</td>
</tr>
<tr>
<td></td>
<td>Network and Security Manager (NSM)</td>
</tr>
<tr>
<td></td>
<td>J-Flow flow monitoring and accounting</td>
</tr>
</tbody>
</table>
### Table 3: Software Features and Licenses (continued)

<table>
<thead>
<tr>
<th>Feature Category</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic analysis</td>
<td>Packet capture</td>
</tr>
<tr>
<td></td>
<td>Real-time performance monitoring (RPM)</td>
</tr>
<tr>
<td></td>
<td>System log</td>
</tr>
<tr>
<td>Activity logging and monitoring</td>
<td>The J-Web interface event viewer</td>
</tr>
<tr>
<td></td>
<td>Traceroute</td>
</tr>
<tr>
<td></td>
<td>Supports the following external administrator databases:</td>
</tr>
<tr>
<td></td>
<td>• RADIUS/AAA</td>
</tr>
<tr>
<td></td>
<td>• TACACS+</td>
</tr>
<tr>
<td>Administration</td>
<td>Autoinstallation</td>
</tr>
<tr>
<td></td>
<td>Configuration rollback</td>
</tr>
<tr>
<td></td>
<td>Button-operated configuration rescue (the CONFIG button)</td>
</tr>
<tr>
<td></td>
<td>Confirmation of configuration changes</td>
</tr>
<tr>
<td></td>
<td>Software upgrades</td>
</tr>
<tr>
<td></td>
<td>Supports the following features for automating network operations and troubleshooting:</td>
</tr>
<tr>
<td></td>
<td>• Commit scripts</td>
</tr>
<tr>
<td></td>
<td>• Operation scripts</td>
</tr>
<tr>
<td></td>
<td>• Event policies</td>
</tr>
<tr>
<td>Hot-swappable</td>
<td>GPIMs and XPIMs are hot-swappable on the SRX650 Services Gateway.</td>
</tr>
<tr>
<td>Bypass ports</td>
<td>LAN bypass ports are not supported on the SRX Series Services Gateways.</td>
</tr>
</tbody>
</table>

**Related Documentation**
- SRX650 Services Gateway Description on page 3
- SRX650 Services Gateway Features and Functions on page 3

**SRX650 Services Gateway Power over Ethernet Overview**

Power over Ethernet (PoE) supports the implementation of the IEEE802.3 af and IEEE802.3 at standards, which allow both data and electric power to pass over a copper Ethernet LAN cable.
The SRX650 Services Gateway provides PoE ports, which supply electric power over the same ports that are used to connect network devices. PoE ports allow you to plug in devices that require both network connectivity and electric power, such as Voice over IP (VoIP) and IP phones and wireless access points.

The PoE ports for the SRX650 Services Gateway reside on the individual XPIMs. The SRX650 Services Gateway supports the following XPIMs with PoE:

- 16-Port Gigabit Ethernet XPIM
- 24-Port Gigabit Ethernet XPIM

The active Services and Routing Engine (SRE) manages the overall system PoE power. You can configure the services gateway to act as power sourcing equipment to supply the power to the GPIMs connected on the designated PoE ports.

Table 4 on page 9 lists the SRX650 Services Gateway PoE specifications.

**Table 4: SRX650 Services Gateway PoE Specifications**

<table>
<thead>
<tr>
<th>Power Management Schemes</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported standards</td>
<td>• IEEE802.3 af</td>
</tr>
<tr>
<td></td>
<td>• IEEE802.3 at</td>
</tr>
<tr>
<td></td>
<td>• Legacy</td>
</tr>
<tr>
<td>Supported slots</td>
<td>PoE is supported on the following front panel slots:</td>
</tr>
<tr>
<td></td>
<td>• 2</td>
</tr>
<tr>
<td></td>
<td>• 4</td>
</tr>
<tr>
<td></td>
<td>• 6</td>
</tr>
<tr>
<td></td>
<td>• 8</td>
</tr>
<tr>
<td>Total PoE power sourcing capacity</td>
<td>The 645 W AC and 645 W DC power supplies support the following capacities:</td>
</tr>
<tr>
<td></td>
<td>• 255 W @PoE on a single power supply, or with redundancy using the two power supply option</td>
</tr>
<tr>
<td></td>
<td>• 510 W @PoE using the two power supply option operating as nonredundant</td>
</tr>
<tr>
<td>Per-port power limit</td>
<td>31.2 W</td>
</tr>
<tr>
<td>Power management modes</td>
<td>• Static: Power allocated for each interface can be configured</td>
</tr>
<tr>
<td></td>
<td>• Class: Power allocation for interfaces is decided based on the class of powered device connected</td>
</tr>
</tbody>
</table>

For more details about the GPIMs and XPIMs, see the *SRX Series Services Gateway for the Branch Physical Interface Modules Hardware Guide*. 
Accessing the SRX650 Services Gateway

You can use two user interfaces to monitor, configure, troubleshoot, and manage the Juniper Networks Services Gateway:

- The J-Web interface: A Web-based graphical interface that allows you to operate a services gateway without commands. The J-Web interface provides access to all Junos OS functionality and features.
- Junos OS command-line interface (CLI): Juniper Networks command shell that runs on top of a UNIX-based operating system kernel. The CLI is a straightforward command interface. On a single line, you type commands that are executed when you press the Enter key. The CLI provides command help and command completion.

Related Documentation
- SRX650 Services Gateway Gigabit-Backplane Physical Interface Modules on page 27
- SRX650 Services Gateway Power Supply on page 33
- SRX650 Services Gateway Back Panel on page 24

Related Documentation
- SRX650 Services Gateway Description on page 3
- SRX650 Services Gateway Features and Functions on page 3
- SRX650 Services Gateway Software Features and Licenses on page 4
CHAPTER 2

Hardware Component Overview

- SRX650 Services Gateway Services and Routing Engine 6 on page 11
- SRX650 Services Gateway Boot Devices and Dual-Root Partitioning Scheme on page 14

SRX650 Services Gateway Services and Routing Engine 6

The Services and Routing Engine (SRE) module provides processing power for security services, routing protocol processes, and other software processes that control the services gateway interfaces, some of the chassis components, system management, and user access to the device.

The services gateway must have one SRE installed.

CAUTION: The SRE is not hot-swappable. You must power off the services gateway before removing or inserting an SRE.

The SRE installs horizontally in the back of the chassis in slots SRE0 or SRE1/SRE1.1. An SRE weighs 3 lb 13.6 oz (1.75 kg).

NOTE: Slot SRE0 is a full-length slot capable of holding a full slot module such as an SRE. The SRE1 and SRE1.1 slots are capable of holding either two half slot modules or one full slot module.

If a slot is not occupied by a card, a blank panel must be installed to shield the empty slot and to maintain proper cooling of the services gateway.

Figure 1 on page 12 shows the front of the SRE.
Figure 1: Services and Routing Engine

Table 5: Services and Routing Engine Component Descriptions

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFFLINE button</td>
<td>NOTE: The OFFLINE button is not supported on the SRE for this release. Gracefully shuts down the SRE for removal when pressed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NOTE: As of release 10.0, you can only have one SRE installed.</td>
</tr>
<tr>
<td>2</td>
<td>RESET CONFIG button</td>
<td>Returns the services gateway to the rescue configuration or the factory default configuration. For more information, see “Resetting the SRX650 Services Gateway” on page 136.</td>
</tr>
<tr>
<td>3</td>
<td>ALARM LED</td>
<td>The ALARM LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates a critical alarm, such as failure of a hardware component or software module, or detection of a firewall attack.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates a major alarm, such as low memory (less than 10% remaining), session full, maximum number of VPN tunnels reached, HA status change, or redundant group member not found.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates that the device is starting up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NOTE: When the system is up and running, if the ALARM LED is off, it indicates that no alarms are present on the device.</td>
</tr>
<tr>
<td>4</td>
<td>POWER LED</td>
<td>The POWER LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates that the SRE is powered on and functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates a power supply unit (PSU) has failed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates that the OFFLINE button on the SRE has been pressed and released. The services gateway will gracefully shut down. When the LED goes off, the SRE can be safely removed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NOTE: The OFFLINE button is not supported on the SRE for this release.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates that the SRE is not receiving power.</td>
</tr>
</tbody>
</table>
### Table 5: Services and Routing Engine Component Descriptions (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>STATUS LED</td>
<td>The STATUS LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates that the SRE is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates that the SRE is starting up, running</td>
</tr>
<tr>
<td></td>
<td></td>
<td>diagnostics, or shutting down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates that the SRE has failed.</td>
</tr>
<tr>
<td>6</td>
<td>HA SRE LED</td>
<td>NOTE: Dual SREs are not supported in this release.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The HA LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates that this SRE is the primary SRE and is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates that this SRE is the secondary SRE and is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates SRE high availability is not enabled.</td>
</tr>
<tr>
<td>7</td>
<td>AUX port</td>
<td>NOTE: The Auxiliary port is not supported on the SRX650 Services Gateway.</td>
</tr>
<tr>
<td>8</td>
<td>CONSOLE port</td>
<td>Connects a laptop to the services gateway for CLI management. The port uses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>an RJ-45 serial connection, is configured as data terminal equipment (DTE),</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and supports the RS-232 (EIA) standard.</td>
</tr>
<tr>
<td>9</td>
<td>CF ACT LED</td>
<td>The CF ACT LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates that a CompactFlash is inserted and functioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and blinking indicates that the CompactFlash is being accessed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates no CompactFlash is inserted.</td>
</tr>
<tr>
<td>10</td>
<td>CompactFlash port</td>
<td>Slot that accepts removable type I or II CompactFlash cards, as defined in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the CompactFlash Specifications published by the CompactFlash Association.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When the removable CompactFlash card is installed and configured, it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>automatically acts as the secondary boot device if the primary CompactFlash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>card fails on startup.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depending on the capacity of the removable CompactFlash card, you can also</td>
</tr>
<tr>
<td></td>
<td></td>
<td>configure it to receive any core files generated during a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The services gateway supports the following CompactFlash cards:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• STEC 2 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wintec 2 GB</td>
</tr>
</tbody>
</table>
Table 5: Services and Routing Engine Component Descriptions (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11,12  | USB 0 and USB 1 ports | The SRE has two USB ports, labeled USB 0 and USB 1, that accept a USB storage device. When the USB drive is installed and configured, it automatically acts as the secondary boot device if the primary CompactFlash card fails on startup.  

**NOTE:** You must install Junos on the USB storage device to use it as the secondary boot device. The services gateway supports the following USB devices:  
- Sandisk Micro Cruzer 2 GB  
- Lexar 2 GB  

Depending on the capacity of the USB drive, you can also configure it to receive core files generated during a failure. |
| 13     | Ejector handles | Small handles on each side of the SRE used to eject it from the chassis (loosen captive screws first). When installing the SRE into the chassis, use the handles to ensure a firm connection with the SRE into the backplane receptor. |
| 14     | Captive screws  | Secures the SRE to the chassis.                                                                                                                                                                           |

**Related Documentation**  
- Removing the SRE from the SRX650 Services Gateway on page 143  
- Installing the SRE on the SRX650 Services Gateway on page 75  
- SRX650 Services Gateway Back Panel on page 24

**SRX650 Services Gateway Boot Devices and Dual-Root Partitioning Scheme**

The SRX650 Services Gateway can boot from the following storage media (in order of priority):  

1. Internal CompactFlash card (default; always present)  
2. External CompactFlash card (alternate)  
3. USB storage key (alternate)

**NOTE:** If you explicitly boot the services gateway using the CLI and the services gateway has two USBs installed (one in slot 0 and the second in slot 1), if the USB in slot 0 fails, the booting sequence will not boot from the second USB installed in slot 1. Instead, the device will boot using the next storage media in its storage media booting priority list: Internal CompactFlash card, then External CompactFlash card.

The dual-root partitions allow the SRX650 Services Gateways to remain functional if there is file system corruption and facilitates easy recovery of the corrupted file system.
The dual-root partitioning scheme keeps the primary and backup Junos OS images in two independently bootable root partitions. If the primary root partition becomes corrupted, the system will be able to boot from the backup Junos OS image located in the other root partition and remain fully functional.

When the SRX650 Services Gateway powers up, it tries to boot the Junos OS from the default storage media. If the device fails to boot from the default storage media, it tries to boot from the alternate storage media. With the dual-root partitioning scheme, the SRX650 Services Gateway first tries to boot the Junos OS from the primary root partition and then from the backup root partition on the default storage media. If both primary and backup root partitions of a media fail to boot, then the device tries to boot from the next available type of storage media. The SRX650 Services Gateway remains fully functional even if it boots the Junos OS from the backup root partition of storage media.

**NOTE:** SRX Series devices that ship from the factory with Junos OS Release 10.0 are formatted with the dual-root partitioning scheme.

Existing SRX650 Services Gateway that are running Junos OS Release 9.6 or earlier use the single-root partitioning scheme. While upgrading these devices to Junos OS Release 10.0, you can choose to format the storage media with dual-root partitions (strongly recommended) or retain the existing single-root partitioning.

For instructions on upgrading to Junos OS Release 10.0, see the *Juniper Networks Junos 10.0 Software Release Notes*.

### Related Documentation
- Installation Overview for the SRX650 Services Gateway on page 63
- Required Tools and Parts for Installing the SRX650 Services Gateway on page 63
- SRX650 Services Gateway Software Configuration Overview on page 97
CHAPTER 3

Chassis Description

- SRX650 Services Gateway Chassis on page 17
- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Back Panel on page 24

SRX650 Services Gateway Chassis

The SRX650 Services Gateway chassis is a rigid sheet metal structure that houses all the other hardware components.

Table 6 on page 17 provides information about the physical specifications for the services gateway.

Table 6: Physical Specifications for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Physical Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis height</td>
<td>2 rack units (U)</td>
</tr>
<tr>
<td>Chassis width</td>
<td>17.5 in. (44.4 cm)</td>
</tr>
<tr>
<td>Chassis depth</td>
<td>18.2 in. (46.2 cm)</td>
</tr>
<tr>
<td>Chassis weight (includes one power supply and one SRE 6 without any GPs)</td>
<td>24.96 lb (11.32 kg)</td>
</tr>
</tbody>
</table>

CAUTION: Before removing or installing components of a functioning services gateway, attach an electrostatic discharge (ESD) strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the device.

The services gateway must be connected to earth ground during normal operation. The protective earthing terminal on the side of the chassis is provided to connect the services gateway to ground. Additional grounding is provided to an AC-powered services gateway when you plug its power supply into a grounded AC power receptacle.
SRX650 Services Gateway Front Panel

The front panel of the SRX650 Services Gateway includes the following components:

- Front panel LEDs
- Electrostatic discharge (ESD) wrist strap outlet
- Power button
- Four Gigabit Ethernet ports
- Eight Gigabit-Backplane Physical Interface Module (GPIM) slots

Figure 2 on page 18 shows the front panel of the SRX650 Services Gateway.

Figure 2: SRX650 Services Gateway Front Panel

Figure 3 on page 18 shows how the slots on the front panel of the SRX650 Services Gateway are numbered.

Figure 3: SRX650 Services Gateway Slot Numbers
Table 7 on page 19 provides information about the front panel components of the services gateway.

Table 7: SRX650 Services Gateway Front Panel Components

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounting brackets</td>
<td>Sides of chassis</td>
<td>Rack-mounting brackets attached when the services gateway is mounted on a rack. The mounting brackets are used to attach the services gateway to a rack or cabinet.</td>
</tr>
<tr>
<td>2</td>
<td>ALARM LED</td>
<td>Left side of the front chassis panel</td>
<td>The ALARM LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Red and steadily on indicates a critical alarm, such as a failure of a hardware component or software module, or detection of a firewall attack.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Amber and steadily on indicates a major alarm, such as low Services Processing Unit (SPU) memory (less than 10% remaining), session full, maximum number of VPN tunnels reached, HA status changed, or redundant group member not found.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Off indicates that the device is starting up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NOTE: When the system is up and running, if the ALARM LED is off, it indicates that no alarms are present on the device.</td>
</tr>
<tr>
<td>3</td>
<td>FAN LED</td>
<td>Left side of the front chassis panel</td>
<td>The FAN LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Green and steadily on indicates that the fan is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Red and steadily on indicates that the fan tray has failed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Off indicates that there is no fan tray.</td>
</tr>
</tbody>
</table>
### Table 7: SRX650 Services Gateway Front Panel Components (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>SRE/ACE LED 1.0</td>
<td>Left side of the front chassis panel</td>
<td>The SRE/ACE 1.0 LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Green and steadily on indicates:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• SRE1 is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• ACE 1.0 half slot is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• ACE 1 full slot is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Amber and steadily on indicates SRE1/ACE1 (full slot) or ACE 1.0 (half slot) is initializing, performing diagnostics, or going down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Red and on steadily indicates SRE1/ACE1 (full slot) or ACE 1.0 (half slot) failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Off indicates SRE/ACE1 slot is empty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>NOTE:</strong> ACE modules will be supported in a future release.</td>
</tr>
<tr>
<td>5</td>
<td>Electrostatic discharge (ESD) outlet</td>
<td>Left side of the front chassis panel</td>
<td>For personal safety, while working on the services gateway, use the ESD outlet to plug in an ESD grounding strap to prevent your body from sending static charges to the services gateway.</td>
</tr>
<tr>
<td>6</td>
<td>4 fixed Gigabit Ethernet ports:</td>
<td>Left side of the front chassis panel</td>
<td>The Gigabit Ethernet ports have the following characteristics:</td>
</tr>
<tr>
<td></td>
<td>• labeled Port 0/0</td>
<td></td>
<td>• Use an RJ-45 connector.</td>
</tr>
<tr>
<td></td>
<td>• labeled Port 0/1</td>
<td></td>
<td>• Operate in full-duplex and half-duplex modes.</td>
</tr>
<tr>
<td></td>
<td>• labeled Port 0/2</td>
<td></td>
<td>• Support flow control.</td>
</tr>
<tr>
<td></td>
<td>• labeled Port 0/3</td>
<td></td>
<td>• Support autonegotiation.</td>
</tr>
<tr>
<td></td>
<td>Provides link speeds of 10/100/1000 Mbps.</td>
<td></td>
<td>The Gigabit Ethernet ports can be used to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Function as front-end network ports.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Provide LAN and WAN connectivity to hubs, switches, local servers, and workstations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Forward incoming data packets to the services gateway.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Receive outgoing data packets from the services gateway.</td>
</tr>
</tbody>
</table>
Table 7: SRX650 Services Gateway Front Panel Components (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
</table>
| 7      | 8 GPIM slots: | Left side of the front chassis panel | • All slots support GPIMs.  
• Slots 2 and 6 support XPIMs.  
• Slots 5 and 7 support SATA High-Disk (RAID).  
• Slots 2, 4, 6, and 8 support PoE.  
For more information about PoE, see “SRX650 Services Gateway Power over Ethernet Overview” on page 8.  

NOTE: GPIMs/XPIMs are hot-swappable.  

GPIM slots 1 through 4 are located at the first 1U high position starting from the left bottom of the chassis.  

GPIM slots 5 through 8 are located at the second 1U high position starting from the left middle of the chassis. For specific GPIM/XPIM slots, see Figure 3 on page 18. |
| 8      | POWER LED | Left side of the front chassis panel | The POWER LED has the following indicator colors:  
• Green and steadily on indicates that the services gateway is functioning normally and that the services gateway and all power supply units (PSUs) are receiving power.  
• Red and steadily on indicates that at least one PSU has failed.  
• Amber and steadily on indicates that the Power button has been pressed and that the services gateway is shutting down gracefully.  
• Off indicates that the services gateway is not receiving power. |
Table 7: SRX650 Services Gateway Front Panel Components (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
</table>
| 9      | HA SYS LED | Left side of the front chassis panel | The High Availability (HA SYS) LED has the following indicator colors:  
  - Green and steadily on indicates that all configured HA links are available.  
  - Red and steadily on indicates that the HA links are not working as expected and a cluster member might be missing or unreachable.  
  - Amber and steadily on indicates that some configured HA links are down, but enough links are still active for full HA functionality. In this situation, performance might be reduced, current bandwidth could cause packet drops, or a single point of failure might now exist.  
  - Off indicates that HA is not enabled. |
| 10     | SRE LED 0  | Left side of the front chassis panel | The Services and Routing Engine (SRE) 0 LED has the following indicator colors:  
  - Green and steadily on indicates SRE0 is functioning normally.  
  - Amber and steadily on indicates SRE0 is initializing, performing diagnostics, or going down.  
  - Red and steadily on indicates SRE0 failure.  
  - Off indicates SRE0 slot is empty. |
## Table 7: SRX650 Services Gateway Front Panel Components (continued)

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11     | SRE/ACE LED 1.1      | Left side of the front chassis panel | The SRE/ACE 1.1 LED has the following indicator colors:  
- Green and steadily on indicates ACE 1.1 half slot is functioning normally. Not applicable with SRE full slot module.  
- Amber and steadily on indicates ACE 1.1 half slot is initializing, performing diagnostics, or going down. Not applicable with SRE or ACE full slot modules.  
- Red and steadily on indicates ACE 1.1 half slot failure. Not applicable with SRE or ACE full slot modules.  
- Off indicates ACE 1.1 half slot is empty.  
**NOTE:** ACE modules will be supported in a future release. |
| 12     | Power button         | Left side of the front chassis panel | Use the Power button to gracefully shut down the services gateway and the SRE. The SRE shuts down other GPIMs first, then shuts itself down.  
On a services gateway that has been previously shut down using the Power button, when depressed the SRE will come back online. After the SRE comes back online, it will bring the other GPIMs online.  
**WARNING:** The Power button does not shut off power to the power supplies or the midplane. You must remove the power cables (DC PSU) and power cords (AC PSU) to completely shut down the services gateway. The DC OK LED light on the PSU changes from green to amber indicating that the software has stopped running. During this time, you can safely remove the SRE and any GPIMs from the services gateway. |
SRX650 Services Gateway Back Panel

The back panel of the SRX650 Services Gateway consists of the following components:

- Two power supply slots
- SRE slot
- Multi-use processing slot
- Fan tray
- Air filter (optional)

**NOTE:** The SRX650 Services Gateway does not ship with an air filter. An air filter must be purchased separately.

Figure 4 on page 24 illustrates the back panel of the SRX650 Services Gateway.

*Figure 4: SRX650 Services Gateway Back Panel*

Table 8 on page 25 provides details about components available on the back panel of the SRX650 Services Gateway.
Table 8: SRX650 Services Gateway Back Panel Components

<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
<th>Usage</th>
</tr>
</thead>
</table>
| 1      | 2 power supply slots. Each power supply contains a power cord outlet. One 645 W AC power supply is provided with the services gateway. | Left side of back panel       | The power supply provides power to the services gateway and its components. When the services gateway is equipped with the two power supply option, they work together to provide redundancy and load-sharing. The following power supplies are available:  
  • 645 W AC power supply with PoE power  
  • 645 W DC power supply with PoE power | Power supplies are hot-swappable and support single- or dual-redundant power supply versions.  
If you need to power off the services gateway after it finishes booting, first use the CLI to halt the device. |
| 2      | Multi-use processing slot number SRE 1 | Top center of the back panel | The multi-use processing slot can contain Application Co-processor (ACE) modules, which can support:  
  • Single full-width ACE processor modules  
  • Up to two half-width ACE processor modules | The multi-use processing slot is rear-pluggable.  

  **NOTE:** ACE modules will be supported in a future release. |
| 3      | Services and Routing Engine (SRE) slot number SRE 0 | Bottom center of the back panel | The SRE 0 slot can contain one SRE module. | The SRE 0 slot is rear-pluggable.  

  **NOTE:** The SRE is not hot-swappable. You must power off the services gateway before removing or inserting an SRE.  
For more details about the SRE 6 module, see “SRX650 Services Gateway Services and Routing Engine 6” on page 11. |
<table>
<thead>
<tr>
<th>Number</th>
<th>Component</th>
<th>Location</th>
<th>Description</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Fan tray (built-in component)</td>
<td>Right of the back panel</td>
<td>Contains four 80 mm fans.</td>
<td>Cools the services gateway and its components. The fan tray is hot-swappable.</td>
</tr>
<tr>
<td>5</td>
<td>Air filter</td>
<td>Right of the back panel, behind the fan tray</td>
<td>Contains one air filter.</td>
<td>Keeps the services gateway and its components free from dust particles. The air filter is hot-swappable.</td>
</tr>
</tbody>
</table>

**NOTE:** The SRX650 Services Gateway does not ship with an air filter. An air filter must be purchased separately.
CHAPTER 4

Interface Module Description

- SRX650 Services Gateway Gigabit-Backplane Physical Interface Modules on page 27

SRX650 Services Gateway Gigabit-Backplane Physical Interface Modules

A Gigabit-Backplane Physical Interface Module (GPIM) is a network interface card (NIC) that installs in the front slots of the services gateway to provide physical connections to a LAN or a WAN. The GPIM receives incoming packets from a network and transmits outgoing packets to a network. These modules will complement the onboard Ethernet interfaces to extend the types and port counts of network connections for the LAN or WAN.

Interface Module Terminology:

- GPIM—The Gigabit-Backplane Interface Module (GPIM) includes standard GPIMs that are installed in a single-high, single-wide GPIM slot that has gigabit connectivity to the system backplane.
- XPIM—The XPIM can be installed only in the 20-gigabit GPIM slots (slots 2 and 6 on the front panel). It may be:
  - A single-high, single-wide LAN switch GPIM that uses one slot
  - A double-high, single-wide LAN switch GPIM that uses two standard slots vertically
  - A double-high, double-wide LAN switch GPIM that uses two standard slots vertically and two standard slots horizontally

NOTE: When installing the 24-Port Gigabit Ethernet XPIM, which uses four slots, you must install it in the 20-gigabit GPIM slots 2 and 6, which refer to the bottom four slots 1 to 4, or the top four slots 5 to 8.

Figure 5 on page 28 shows how the slots on the front panel of the SRX650 Services Gateway are numbered.
Figure 5: SRX650 Services Gateway Slot Numbers

[Diagram of SRX650 Services Gateway Slot Numbers]

CAUTION: GPIMs are hot-swappable.

For more details about the supported GPIMs and XPIMs, and the minimum supported Junos OS release, see the SRX Series Services Gateway Interface Modules and Compatibility.

For more information about how to install and configure GPIMs, refer to the SRX Series Services Gateways for the Branch Physical Interface Modules Hardware Guide.

Figure 6 on page 28, Figure 7 on page 28, and Figure 8 on page 28 show the three form factors for the services gateway GPIMs.

Figure 6: Example of a Standard GPIM (Installs in One Standard Slot)

[Diagram of a Standard GPIM]

Figure 7: Example of a Double-High, Single-Wide XPIM

[Diagram of a Double-High, Single-Wide XPIM]

Figure 8: Example of a Double-High, Double-Wide XPIM

[Diagram of a Double-High, Double-Wide XPIM]

Since the services gateway GPIMs communicate with the backplane at various performance levels, you must install them in the correct slots.

Related Documentation:
- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Power over Ethernet Overview on page 8
- Installing a Double-High, Double-Wide Gigabit-Backplane Physical Interface Module on the SRX Series Services Gateway
- Interface Modules Reference for Branch SRX Series
CHAPTER 5

Cooling System Description

- SRX650 Services Gateway Cooling System on page 31

SRX650 Services Gateway Cooling System

The fan controller is the cooling system component provided in the SRX650 Services Gateway to keep all components within the acceptable temperature range.

The services gateway has a single fan tray that contains four 80 mm fans.

The fan controller constantly monitors the temperature of the services gateway and all modules (SRE or GPIMs) installed in the device at any given time. Under normal operating conditions, the fans function at lower than full speed.

If any one of the four fans fails, the services gateway generates a warning but keeps the system running. If the temperature keeps rising, the services gateway lowers the power consumption by reducing the performance or shutting down some of the chassis components. However, if the ambient maximum temperature specification exceeds the warning limit and the system cannot be adequately cooled, then the services gateway shuts down the system and hardware components completely.

- Related Documentation
  - SRX650 Services Gateway Chassis on page 17
  - SRX650 Services Gateway Front Panel on page 18
  - SRX650 Services Gateway Back Panel on page 24
  - SRX650 Services Gateway Power Supply on page 33
Power System Description

- SRX650 Services Gateway Power Supply on page 33

SRX650 Services Gateway Power Supply

The SRX650 Services Gateway uses either one AC or one DC power supply unit (PSU). The services gateway is equipped with one AC power supply (see Figure 9 on page 33). A second PSU is optional (sold separately). A second PSU can be used to meet power requirements exceeding the wattage provided by a single PSU in a nonredundant configuration by using two power supplies in a system using more power than a single PSU provides. A second AC or DC power supply can be used with its matching type of power supply to provide redundancy and load-sharing to the services gateway and its components. If one power supply fails or is removed, the remaining power supply redistributes the electrical load without interruption. The services gateway reassesses the power required to support its configuration and issues errors if the available power is insufficient. See Figure 10 on page 34 for a diagram of the DC power supply.

CAUTION: Do not mix AC and DC power supplies within the same services gateway. Damage to the device might occur.

All power supplies are hot-swappable and support single or dual redundant power supply versions. Each power supply is cooled by the system’s fans.

Figure 9: Single AC Power Supply for the SRX650 Services Gateway
The power supplies produce and distribute different output voltages to the services gateway components according to their voltage requirements.

The available power supply components are listed in Table 9 on page 34.

Table 9: Component Power Output/Consumption

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Output/Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>645 W AC power supply</td>
<td>This power supply can provide:</td>
</tr>
<tr>
<td></td>
<td>• 390 W @12 V</td>
</tr>
<tr>
<td></td>
<td>• 255 W @PoE on a single power supply, or with redundancy using the two power supply option</td>
</tr>
<tr>
<td></td>
<td>• 510 W @PoE using the two power supply option operating as nonredundant</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Using the two power supply option operating as nonredundant for up to 510 W @PoE power, the administrator has the ability to prioritize the PoE ports that will receive power if an outage should occur to either the power source or to one of the power supplies.</td>
</tr>
<tr>
<td>645 W DC power supply</td>
<td>This power supply can provide:</td>
</tr>
<tr>
<td></td>
<td>• 390 W @12 V</td>
</tr>
<tr>
<td></td>
<td>• 255 W @PoE on a single power supply, or with redundancy using the two power supply option</td>
</tr>
<tr>
<td></td>
<td>• 510 W @PoE using the two power supply option operating as nonredundant</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Using the two power supply option operating as nonredundant for up to 510 W @PoE power, the administrator has the ability to prioritize the PoE ports that will receive power if an outage should occur to either the power source or to one of the power supplies.</td>
</tr>
</tbody>
</table>
Chapter 6: Power System Description

Related Documentation

- SRX650 Services Gateway Chassis on page 17
- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Back Panel on page 24
- SRX650 Services Gateway Cooling System on page 31
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132
PART 2

Site Planning and Specifications

- Planning and Preparing the Site on page 39
- Rack Requirements on page 43
- Cabinet Requirements on page 51
- Power Requirements and Specifications on page 53
- Cable Specifications and Pinouts on page 59
CHAPTER 7

Planning and Preparing the Site

- Site Preparation Checklist for the SRX650 Services Gateway on page 39
- General Site Installation Guidelines for the SRX650 Services Gateway on page 41
- SRX650 Services Gateway Environmental Specifications on page 42

Site Preparation Checklist for the SRX650 Services Gateway

The checklist in Table 10 on page 39 summarizes the tasks you need to perform when preparing a site for installing the SRX650 Services Gateway.

Table 10: Site Preparation Checklist for SRX650 Services Gateway Installation

<table>
<thead>
<tr>
<th>Item or Task</th>
<th>Additional Information</th>
<th>Performed By</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure distance between external power sources and device installation site.</td>
<td>“SRX650 Services Gateway Electrical Wiring Guidelines” on page 53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locate sites for connection of system grounding.</td>
<td>“Grounding the SRX650 Services Gateway” on page 82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculate the power consumption and requirements.</td>
<td>“SRX650 Services Gateway AC Power Supply Electrical Specifications” on page 56 and “SRX650 Services Gateway DC Power Supply Electrical Specifications” on page 56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environment
<table>
<thead>
<tr>
<th>Item or Task</th>
<th>Additional Information</th>
<th>Performed By</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify that environmental factors such as temperature and humidity do not exceed device tolerances.</td>
<td>“SRX650 Services Gateway Environmental Specifications” on page 42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rack Installation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify that your rack meets the minimum requirements.</td>
<td>“SRX650 Services Gateway Rack Size and Strength Requirements” on page 47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan rack location, including required space clearances.</td>
<td>“SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes” on page 47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure the rack to the floor and building structure.</td>
<td>“Connecting the SRX650 Services Gateway to the Building Structure” on page 69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabinet Installation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify that your cabinet meets the minimum requirements.</td>
<td>“SRX650 Services Gateway Cabinet Size and Clearance Requirements” on page 51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan the cabinet location, including required space clearances.</td>
<td>“SRX650 Services Gateway Cabinet Airflow Requirements” on page 52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquire cables and connectors.</td>
<td>“Interface Cabling and Wiring Specifications for the SRX650 Services Gateway” on page 59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected.

Plan the cable routing and management.

Related Documentation

- SRX650 Services Gateway Chassis on page 17
- Installation Overview for the SRX650 Services Gateway on page 63
- General Site Installation Guidelines for the SRX650 Services Gateway on page 41

General Site Installation Guidelines for the SRX650 Services Gateway

The following precautions help you plan an acceptable operating environment for your SRX650 Services Gateway and avoid environmentally caused equipment failures:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. Allow sufficient clearance between the front and back of the chassis and adjacent equipment. Ensure that there is adequate circulation in the installation location.

- Follow the ESD procedures to avoid damaging equipment. Static discharge can cause components to fail completely or intermittently over time. For more information, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

- Ensure that the blank panels are installed into empty slots to prevent any interruption or reduction in the flow of air across internal components.

**NOTE:** Install the services gateway only in restricted areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110–16, 110–17, and 110–18 of the National Electrical Code, ANSI/NFPA 70.
SRX650 Services Gateway Environmental Specifications

Table 11 on page 42 provides the required environmental conditions for normal SRX650 Services Gateway operations. In addition, the site must be as dust-free as possible because dust can clog air intake vents and filters, reducing the efficiency of the cooling system.

**Table 11: SRX650 Services Gateway Environmental Specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude</td>
<td>No performance degradation to 13,000 ft (3962.4 m)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Normal operation ensured in relative humidity range of 5% to 90%, noncondensing</td>
</tr>
<tr>
<td>Temperature</td>
<td>Normal operation ensured in temperature range of 32°F (0°C) to 104°F (40°C) Nonoperating storage temperature in shipping container: −40°F (−40°C) to 158°F (70°C)</td>
</tr>
<tr>
<td>Seismic</td>
<td>Designed to meet Telcordia Technologies Zone 4 earthquake requirements</td>
</tr>
<tr>
<td>Maximum thermal output</td>
<td>AC power: 4400 BTU/hour DC power with one 645 W power supply unit: 2200 BTU/hour DC power with two 645 W power supply units, non-redundant: 4400 BTU/hour</td>
</tr>
</tbody>
</table>

**NOTE:** These specifications are estimates and subject to change.

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

Related Documentation

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Routine Maintenance Procedures for the SRX650 Services Gateway on page 123
CHAPTER 8

Rack Requirements

- Rack-Mounting Requirements and Warnings on page 43
- SRX650 Services Gateway Rack Size and Strength Requirements on page 47
- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48

Rack-Mounting Requirements and Warnings

Ensure that the equipment rack into which the services gateway is installed is evenly and securely supported to avoid hazardous conditions that could result from uneven mechanical loading.

**WARNING:** To prevent bodily injury when mounting or servicing the services gateway in a rack, take the following precautions to ensure that the system remains stable. The following directives help maintain your safety:

- The services gateway must be installed in a rack that is secured to the building structure.
- The services gateway should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the services gateway in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the services gateway in the rack.

Waarschuwing Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:
• De Juniper Networks services gateway moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.

• Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.

• Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.

• Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

Varoitus Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

• Juniper Networks services gateway on asennettava telineeseen, joka on kiinnitetty rakennukseen.

• Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.

• Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.

• Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

Attention Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

• Le rack sur lequel est monté le Juniper Networks services gateway doit être fixé à la structure du bâtiment.

• Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.

• Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l’élément le plus lourd dans le bas.

• Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l’unité en casier.

Warnung Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:
• Der Juniper Networks services gateway muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.

• Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.

• Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.

• Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

Avvertenza Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:

• Il Juniper Networks services gateway deve essere installato in un telaio, il quale deve essere fissato alla struttura dell’edificio.

• Questa unità deve venire montata sul fondo del supporto, se si tratta dell’unica unità da montare nel supporto.

• Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all’alto, con il componente più pesante sistemato sul fondo del supporto.

• Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell’unità nel supporto.

Advarsel Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøyde med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:

• Juniper Networks services gateway må installeres i et stativ som er forankret til bygningsstrukturen.

• Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.

• Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.

• Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

Aviso Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar
de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:

- O Juniper Networks services gateway deverá ser instalado numa prateleira fixa à estrutura do edifício.
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

¡Atención! Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:

- El Juniper Networks services gateway debe instalarse en un bastidor fijado a la estructura del edificio.
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

Warning! För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda försiktighetsåtgärder för att försära dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- Juniper Networks services gateway måste installeras i en ställning som är föranord i byggnadens struktur.
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
SRX650 Services Gateway Rack Size and Strength Requirements

When installing the services gateway in a rack, you must ensure that the rack complies with a 2U (19 in or 45.6 cm) rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310-D) published by the Electronic Industries Alliance (http://www.ecairo/eia/site/index.html).

When selecting a rack, ensure that the physical characteristics of the rack comply with the following specifications:

- The outer edges of the mounting brackets extend the width of the chassis to 19 in (45.6 cm).
- The front of the chassis extends approximately 0.5 in (1.27 cm) beyond the mounting ears.

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**Related Documentation**

- General Site Installation Guidelines for the SRX650 Services Gateway on page 41
- SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
- Connecting the SRX650 Services Gateway to the Building Structure on page 69

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**SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes**

The spacing of the mounting brackets and flange holes on the rack and device mounting brackets are as follows:

- The holes within each rack set are spaced at 2U (3.5 in. or 8.89 cm). The services gateway can be mounted in any rack that provides holes or hole patterns spaced at 1U (1.75 in. or 4.5 cm) increments.
- The mounting brackets and front-mount flanges used to attach the chassis to a rack are designed to fasten to holes spaced at rack distances of 2U (3.5 in.).
- The mounting holes in the mounting brackets provided with the device chassis are spaced 1.25 in. (3.2 cm) apart, measured from the center of each hole.

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**Related Documentation**

- General Site Installation Guidelines for the SRX650 Services Gateway on page 41
- SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway

When planning the installation site for the SRX650 Services Gateway, you need to allow sufficient clearance around the rack.

When planning the installation site for the services gateway, consider the following:

- For the cooling system to function properly, the airflow around the chassis must be unrestricted. The fan tray contains four fans and provides side-to-side chassis cooling. Figure 11 on page 49 shows the direction of airflow through the chassis.
- For service personnel to remove and install hardware components, there must be adequate space at the front and back of the services gateway as indicated in Table 12 on page 48.
- If you are mounting the services gateway in a rack with other equipment, ensure that the exhaust from other equipment does not blow into the intake vents of the chassis.

Table 12 on page 48 provides information about the clearance requirements for maintaining optimum airflow and the distances to facilitate easy maintenance of the services gateway.

Table 12: Clearance Requirements for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Location</th>
<th>Recommended Clearance</th>
<th>Requirement for Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front of the chassis</td>
<td>8.7 in (22 cm)</td>
<td>Space for service personnel to remove and install hardware components</td>
</tr>
<tr>
<td>Rear of the chassis</td>
<td>17.4 in (44.2 cm)</td>
<td>Space for service personnel to remove and install hardware components</td>
</tr>
<tr>
<td>Between front-mounting flange and rack or cabinet edge</td>
<td>2.5 in (6.35 cm)</td>
<td>Space for cable management and organization</td>
</tr>
<tr>
<td>Between both sides of the chassis and any non-heat-producing surface such as a wall or cabinet side</td>
<td>6.0 in (15.24 cm)</td>
<td>Space for the cooling system to function properly and to maintain unrestricted airflow around the chassis</td>
</tr>
</tbody>
</table>
Figure 11: Airflow Through the Chassis

Related Documentation

• SRX650 Services Gateway Description on page 3
• SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
• Site Preparation Checklist for the SRX650 Services Gateway on page 39
• SRX650 Services Gateway Rack Size and Strength Requirements on page 47
• General Site Installation Guidelines for the SRX650 Services Gateway on page 41
Cabinet Requirements

- SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
- SRX650 Services Gateway Cabinet Airflow Requirements on page 52

**SRX650 Services Gateway Cabinet Size and Clearance Requirements**

You can install the SRX650 Services Gateway in a 19 in (48.3 cm) cabinet as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310-D) published by the Electronic Industries Alliance (http://www.eiaus.org/eia/site/index.html). You must mount the services gateway horizontally in the cabinet.

**NOTE:** The holes in the mounting brackets chassis are spaced 1.25 in (3.2 cm) apart, measured from the center of the hole.

When selecting a cabinet, ensure that it meets the following specifications:

- The cabinet is at least 2U (3.50 in or 8.89 cm) and can accommodate the services gateway.
- The outer edges of the mounting brackets extend the width of either chassis to 19 in (48.2 cm), and the front of the chassis extends approximately 0.5 in (1.27 cm) beyond the mounting brackets.
- The minimum total clearance inside the cabinet is 30.7 in (78 cm) between the inside of the front door and the inside of the rear door.

**NOTE:** A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating.

**Related Documentation**

- SRX650 Services Gateway Chassis on page 17
- SRX650 Services Gateway Cabinet Airflow Requirements on page 52
- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
- SRX650 Services Gateway Rack Size and Strength Requirements on page 47
SRX650 Services Gateway Cabinet Airflow Requirements

When you mount the SRX650 Services Gateway in a cabinet, you must ensure that ventilation through the cabinet is sufficient to prevent overheating. Consider the following when planning for chassis cooling:

- Ensure that the cool air supply you provide through the cabinet can adequately dissipate the thermal output of the services gateway.
- Install the services gateway as close as possible to the front of the cabinet so that the cable management system clears the inside of the front door. Installing the chassis close to the front of the cabinet maximizes the clearance in the rear of the cabinet for critical airflow.
- Route and dress all cables to minimize the blockage of airflow to and from the chassis.

Related Documentation

- SRX650 Services Gateway Chassis on page 17
- SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
- SRX650 Services Gateway Rack Size and Strength Requirements on page 47
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
CHAPTER 10

Power Requirements and Specifications

- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- SRX650 Services Gateway Supported AC Power Cords on page 54
- SRX650 Services Gateway DC Power Supply Electrical Specifications on page 56
- SRX650 Services Gateway AC Power Supply Electrical Specifications on page 56
- SRX650 Services Gateway DC Power Cable Specifications on page 57
- SRX650 Services Gateway Power Requirements on page 58

**SRX650 Services Gateway Electrical Wiring Guidelines**

Table 13 on page 53 describes the factors you must consider while planning the electrical wiring for the SRX650 Services Gateway at your site.

![CAUTION:](image)

**CAUTION:** It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.

**Table 13: Site Electrical Wiring Guidelines for the SRX650 Services Gateway**

<table>
<thead>
<tr>
<th>Site Wiring Factor</th>
<th>Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signaling limitations</td>
<td>To ensure that signaling functions optimally:</td>
</tr>
<tr>
<td></td>
<td>- Install wires correctly.</td>
</tr>
<tr>
<td></td>
<td>- Improperly installed wires can emit radio interference.</td>
</tr>
<tr>
<td></td>
<td>- Do not exceed the recommended distances or pass wires between buildings.</td>
</tr>
<tr>
<td></td>
<td>- The potential for damage from lightning strikes increases if wires exceed recommended distances or if wires pass between buildings.</td>
</tr>
<tr>
<td></td>
<td>- Shield all conductors.</td>
</tr>
<tr>
<td></td>
<td>- The electromagnetic pulse (EMP) caused by lightning can damage unshielded conductors and destroy electronic devices.</td>
</tr>
</tbody>
</table>
Table 13: Site Electrical Wiring Guidelines for the SRX650 Services Gateway (continued)

<table>
<thead>
<tr>
<th>Site Wiring Factor</th>
<th>Guideline</th>
</tr>
</thead>
</table>
| **Radio frequency interference (RFI)** | To reduce or eliminate the emission of RFI from your site wiring:  
  • Use twisted-pair cable with a good distribution of grounding conductors.  
  • Use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable, if you must exceed the recommended distances. |
| **Electromagnetic compatibility (EMC)** | Provide a properly grounded and shielded environment and use electrical surge-suppression devices.  
  Strong sources of electromagnetic interference (EMI) can cause the following damage:  
  • Destroy the signal drivers and receivers in the device  
  • Conduct power surges over the lines into the equipment, resulting in an electrical hazard  
  **TIP:** If your site is susceptible to problems with EMC, particularly from lightning or radio transmitters, you might want to seek expert advice. |

**WARNING:** Some ports are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports, the battery return connection is to be treated as an Isolated DC return (that is, DC-I), as defined in GR-1089-CORE) and require isolation from the exposed OSP cabling. To comply the NEBS requirements and protect against lightening surges and commercial power disturbances, the intrabuilding port(s) of the device MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. The intrabuilding port(s) of the device is suitable for connection to intrabuilding or unexposed wiring or cabling only. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

**Related Documentation**
- General Site Installation Guidelines for the SRX650 Services Gateway on page 41
- Maintaining the SRX650 Services Gateway Power Supply on page 124
- SRX650 Services Gateway Power Requirements on page 58
- SRX650 Services Gateway Environmental Specifications on page 42

**SRX650 Services Gateway Supported AC Power Cords**

**WARNING:** The AC power cord for the services gateway is intended for use with the services gateway only and not for any other use.
NOTE: In North America, AC power cords must not exceed 4.5 m (approximately 14.75 ft) in length, to comply with National Electrical code (NEC) Section 400-8 (NFPA 75, 5-2.2) and 210-52, and Canadian Electrical Code (CEC) Section 4-010(3).

Table 14 on page 55 provides power cord specifications, and Figure 12 on page 55 depicts the plug on the AC power cord provided for each country or region.

**Table 14: AC Power Cord Specifications**

<table>
<thead>
<tr>
<th>Country</th>
<th>Electrical Specification</th>
<th>Plug Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>250 VAC, 10 A, 50 Hz</td>
<td>AS/NZ 3112-1993</td>
</tr>
<tr>
<td>China</td>
<td>250 VAC, 10 A, 50 Hz</td>
<td>GB2099.11996 and GB 1002 1996 (CH1-10P)</td>
</tr>
<tr>
<td>Europe (except Italy and United Kingdom)</td>
<td>250 VAC, 10 A, 50 Hz</td>
<td>CEE (7) VII</td>
</tr>
<tr>
<td>Italy</td>
<td>250 VAC, 10 A, 50 Hz</td>
<td>CEI 23-16/VII</td>
</tr>
<tr>
<td>Japan</td>
<td>125 VAC, 12 A, 50 or 60 Hz</td>
<td>JIS 8303</td>
</tr>
<tr>
<td>North America</td>
<td>125 VAC, 10 A, 60 Hz</td>
<td>NEMA 5-15</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>250 VAC, 10 A, 50 Hz</td>
<td>BS 1363A</td>
</tr>
</tbody>
</table>

**Figure 12: AC Plug Types**

NOTE: Power cords and cables must not block access to services gateway components or drape where people might trip on them.

- SRX650 Services Gateway Power Supply on page 33
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
SRX650 Services Gateway DC Power Supply Electrical Specifications

The DC power supply electrical specifications for the SRX650 Services Gateway are listed in Table 15 on page 56.

Table 15: DC Power Supply Electrical Specifications for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Specification</th>
<th>Power Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range: –40 to –72 VDC</td>
<td>DC input voltage</td>
</tr>
<tr>
<td>DC system current rating</td>
<td>16 A @ –48 VDC</td>
</tr>
</tbody>
</table>

Related Documentation
- SRX650 Services Gateway Power Supply on page 33
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Site Preparation Checklist for the SRX650 Services Gateway on page 39

SRX650 Services Gateway AC Power Supply Electrical Specifications

The AC power supply electrical specifications for the SRX650 Services Gateway are listed in Table 16 on page 56.

Table 16: AC Power Supply Electrical Specifications for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Specification</th>
<th>Power Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC input voltage</td>
<td>100 to 240 VAC</td>
</tr>
<tr>
<td>AC input line frequency</td>
<td>50 to 60 Hz</td>
</tr>
<tr>
<td>AC system current rating</td>
<td>7.6 to 3.8 A</td>
</tr>
</tbody>
</table>

Related Documentation
- SRX650 Services Gateway Power Supply on page 33
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
SRX650 Services Gateway DC Power Cable Specifications

The DC power supply in slot 0 must be powered by dedicated power feeds derived from feed A, and the DC power supply in slot 1 must be powered by dedicated power feeds derived from feed B. This configuration provides the commonly deployed A/B feed redundancy for the system.

**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.

**WARNING:** For field-wiring connections, use copper conductors only.

For other electrical safety information, see “SRX650 Services Gateway Electrical Wiring Guidelines” on page 53.

**CAUTION:** Power cords and cables must not block access to services gateway components or drape where people could trip on them.

Table 17 on page 57 summarizes the specifications for the power cable(s), which you must supply.

**Table 17: DC Power Cable Specifications**

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Quantity and Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>8 AWG, minimum 60°C wire, or as permitted by the local code</td>
</tr>
</tbody>
</table>

**Related Documentation**

- SRX650 Services Gateway Power Supply on page 33
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
SRX650 Services Gateway Power Requirements

The electrical and power requirements for the SRX650 Services Gateway provide information about the factors you must consider while planning the electrical wiring and power availability at your site. These requirements cover the following areas:

- Power specifications and requirements for the services gateway
- Electrical wiring guidelines for the services gateway installation site
- Power, connection, and power cord specifications for the services gateway
- Grounding guidelines and specifications for the services gateway

Related Documentation

- SRX650 Services Gateway Power Supply on page 33
- Clearance Requirements for Airflow and Hardware Maintenance of the SRX650 Services Gateway on page 48
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Grounding the SRX650 Services Gateway on page 82
CHAPTER 11

Cable Specifications and Pinouts

- Interface Cabling and Wiring Specifications for the SRX650 Services Gateway on page 59
- RJ-45 Connector Pinouts for the SRX650 Services Gateway Ethernet Port on page 59
- RJ-45 Connector Pinouts for the SRX650 Services Gateway Console Port on page 60

Interface Cabling and Wiring Specifications for the SRX650 Services Gateway

The network interfaces supported on the services gateway accept different kinds of network cables. Table 18 on page 59 lists the specifications for the cables that connect to ports on the services gateway.

Table 18: Cable and Wire Specifications for Ports and Alarm Interfaces

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable Specification</th>
<th>Cable/Wire Supplied</th>
<th>Maximum Length</th>
<th>Device Receptacle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Console</td>
<td>RS-232 (EIA-232) serial cable</td>
<td>One 6-ft (1.83-m) length with DB-9/DB-9 connectors</td>
<td>6 ft (1.83 m)</td>
<td>DB-9 male</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Category 5 cable or equivalent suitable for 100Base-T operation</td>
<td>One 15-ft (4.57-m) length with RJ-45/RJ-45 connectors</td>
<td>328 ft (100 m)</td>
<td>RJ-45 autosensing</td>
</tr>
</tbody>
</table>

NOTE: The Auxiliary port is not supported on the SRX650 Services Gateway.

RJ-45 Connector Pinouts for the SRX650 Services Gateway Ethernet Port

The port on the front panel labeled ETHERNET is an autosensing 10/100-Mbps Ethernet RJ-45 receptacle that accepts an Ethernet cable for connecting the services gateway to a management LAN (or other device that supports out-of-band management). Table 19 on page 60 describes the RJ-45 connector pinouts for the Ethernet port.
Table 19: RJ-45 Connector Pinouts for Services Gateway Ethernet Port

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX+</td>
</tr>
<tr>
<td>2</td>
<td>TX-</td>
</tr>
<tr>
<td>3</td>
<td>RX+</td>
</tr>
<tr>
<td>4</td>
<td>Termination network</td>
</tr>
<tr>
<td>5</td>
<td>Termination network</td>
</tr>
<tr>
<td>6</td>
<td>RX-</td>
</tr>
<tr>
<td>7</td>
<td>Termination network</td>
</tr>
<tr>
<td>8</td>
<td>Termination network</td>
</tr>
</tbody>
</table>

RJ-45 Connector Pinouts for the SRX650 Services Gateway Console Port

The port on the front panel labeled CONSOLE is an autosensing 10/100-Mbps Ethernet RJ-45 receptacle that accepts an RJ-45 cable for connecting the services gateway to a management LAN (or other device that supports out-of-band management). Table 20 on page 60 describes the RJ-45 connector pinouts for the console port.

Table 20: RJ-45 Connector Pinouts for the Services Gateway Console Port

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RTS</td>
<td>Request to Send</td>
</tr>
<tr>
<td>2</td>
<td>DTR</td>
<td>Data Terminal Ready</td>
</tr>
<tr>
<td>3</td>
<td>TXD</td>
<td>Transmit Data</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>6</td>
<td>RXD</td>
<td>Receive Data</td>
</tr>
<tr>
<td>7</td>
<td>DSR/DCD</td>
<td>Data Set Ready</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>Clear to Send</td>
</tr>
</tbody>
</table>
PART 3

Initial Installation and Configuration

• Installation Overview on page 63
• Unpacking the Services Gateway on page 65
• Installing the Mounting Hardware on page 69
• Installing the Services Gateway on page 71
• Grounding the SRX650 Services Gateway on page 81
• Connecting the SRX650 Services Gateway to External Devices on page 85
• Providing Power to the SRX650 Services Gateway on page 91
• Performing Initial Configuration on page 97
CHAPTER 12

Installation Overview

- Installation Overview for the SRX650 Services Gateway on page 63
- Required Tools and Parts for Installing the SRX650 Services Gateway on page 63
- SRX650 Services Gateway Autoinstallation Overview on page 64

Installation Overview for the SRX650 Services Gateway

After you have prepared the site for installation and unpacked the SRX650 Services Gateway, you are ready to install the device. It is important to proceed through the installation process in the following order:

1. Review the safety guidelines explained in “General Electrical Safety Guidelines and Warnings” on page 187.

2. Prepare the services gateway for installation as described in “Preparing the SRX650 Services Gateway for Rack-Mount Installation” on page 69.

3. Install the services gateway as described in “Installing the SRX650 Services Gateway in a Rack” on page 72.

4. Connect cables to external devices.

5. Connect the grounding cable as described in “Grounding the SRX650 Services Gateway” on page 82.

6. Power on the services gateway as described in “Powering On the SRX650 Services Gateway” on page 94.

Required Tools and Parts for Installing the SRX650 Services Gateway

To install the services gateway, you need the following tools and parts:

- Phillips (+) screwdriver, number 2
- Tie wrap
Autoinstallation provides automatic configuration for a new services gateway that you connect to the network and turn on, or for a services gateway configured for autoinstallation. The autoinstallation process begins whenever a services gateway is powered on and cannot locate a valid configuration file in the CompactFlash. Typically, a configuration file is unavailable when a services gateway is powered on for the first time or if the configuration file is deleted from the CompactFlash. The autoinstallation feature enables you to deploy multiple services gateways from a central location in the network.

If you are setting up many services gateways, autoinstallation can help automate the configuration process by loading configuration files onto new or existing devices automatically over the network. You can use the CLI to configure a services gateway for autoinstallation. J-Web does not include pages for the autoinstallation feature.

For the autoinstallation feature to work, you must store one or more host-specific or default configuration files on a configuration server in the network and have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the services gateway.

Autoinstallation begins automatically when you connect to Ethernet port ge-0/0/0 on a new services gateway connected to the network and power on the services gateway. To simplify the process, you can explicitly enable autoinstallation on a services gateway and specify a configuration server, an autoinstallation interface, and a protocol for IP address acquisition.

NOTE: Autoinstallation is enabled on all ports of the services gateway. If you do not want to use the autoinstallation feature, you must delete it using the CLI. For more information about the autoinstallation feature, see the Initial Configuration for Security Devices.
CHAPTER 13

Unpacking the Services Gateway

- Required Tools and Parts for Unpacking the SRX650 Services Gateway on page 65
- Unpacking the SRX650 Services Gateway on page 65
- Verifying Parts Received with the SRX650 Services Gateway on page 66

Required Tools and Parts for Unpacking the SRX650 Services Gateway

To unpack the SRX650 Services Gateway, you need the following tools:

- Phillips (+) screwdriver, number 2
- 1/2 in. (13 mm) open-end or socket wrench to remove bracket bolts from the shipping pallet
- Blank panels to cover any slots not occupied by a component

Unpacking the SRX650 Services Gateway

The SRX650 Services Gateway is shipped in a cardboard carton and secured with foam packing material. The carton also contains an accessory box and quick start instructions.

NOTE: The services gateway is maximally protected inside the cardboard carton. Do not unpack it until you are ready to begin installation.
To unpack the SRX650 Services Gateway:

1. Move the cardboard carton to a staging area as close to the installation site as possible, where you have enough room to remove the components from the chassis.

2. Position the cardboard carton with the arrows pointing up.

3. Carefully open the top of the cardboard carton.

4. Remove the foam covering the top of the services gateway.

5. Remove the accessory box.

6. Verify the parts received against the lists in “Verifying Parts Received with the SRX650 Services Gateway” on page 66.

7. Store the brackets and bolts inside the accessory box.

8. Save the shipping carton and packing materials in case you need to move or ship the services gateway at a later time.

Related Documentation

- Required Tools and Parts for Unpacking the SRX650 Services Gateway on page 65
- Preparing the SRX650 Services Gateway for Rack-Mount Installation on page 69
- Installation Overview for the SRX650 Services Gateway on page 63

Verifying Parts Received with the SRX650 Services Gateway

The SRX650 Services Gateway shipment package contains a packing list. Check the parts in the shipment against the items on the packing list. The packing list specifies the part numbers and carries a brief description of each part in your order.

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

A fully configured services gateway contains the chassis with installed components, listed in Table 21 on page 67, and an accessory box, which contains the parts listed in Table 22 on page 67.

NOTE: The parts shipped with your services gateway can vary depending on the configuration you ordered.
### Table 21: Parts List for a Fully Configured SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2U SRX650 Services Gateway chassis with 8 GPIM slots, 1 SRE slot, and 1 multi-use processor slot; 2 power supply slots; 1 fan tray with fans; and 4 10/100/1000 base-T ports. Includes blank covers for GPIM (8 covers for GPIM slots), SRE, multi-use processor, and power supply slots.</td>
<td>1</td>
</tr>
<tr>
<td>Front-mount and mid-mount rack-mount kit</td>
<td>1</td>
</tr>
<tr>
<td>Console cable</td>
<td>1</td>
</tr>
<tr>
<td>SRX650 Services Gateway Hardware Guide</td>
<td>1</td>
</tr>
<tr>
<td>SRX650 Services Gateway Getting Started Guide</td>
<td>1</td>
</tr>
<tr>
<td>Services and Routing Engine 6 (SRE 6) main system board that includes 2 GB DRAM CompactFlash card</td>
<td>1</td>
</tr>
<tr>
<td>645 W AC power supply that provides: 390 W system power at 12 V; 255 W PoE power on a single power supply, or with redundancy using the two power supply option; and 510 W PoE without redundancy on two power supplies. Works with 90–264 VAC input.</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTE:** The shipment includes one power cord appropriate for your geographical location.

Two power supplies must be installed in the services gateway for redundancy. A second power supply and additional power supplies are separately orderable and do not include the power cord. Additional power cords must be ordered separately.

### Table 22: Accessory/Upgrade Parts List for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Part</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juniper Networks Product Warranty</td>
<td>1</td>
</tr>
<tr>
<td>End User License Agreement</td>
<td>1</td>
</tr>
<tr>
<td>Spare front-mount and mid-mount rack-mount kit</td>
<td>1</td>
</tr>
<tr>
<td>Spare SRE and multi-use slot blank cover</td>
<td>1</td>
</tr>
<tr>
<td>Spare power supply slot blank cover</td>
<td>1</td>
</tr>
<tr>
<td>Spare fan tray with fans</td>
<td>1</td>
</tr>
<tr>
<td>Air filter (optional)</td>
<td>1</td>
</tr>
<tr>
<td>2 GB DRAM CompactFlash card</td>
<td>1</td>
</tr>
<tr>
<td>645 W DC power supply with PoE support</td>
<td>1</td>
</tr>
</tbody>
</table>
Related Documentation

- Required Tools and Parts for Unpacking the SRX650 Services Gateway on page 65
- Preparing the SRX650 Services Gateway for Rack-Mount Installation on page 69
- Unpacking the SRX650 Services Gateway on page 65
Installing the Mounting Hardware

- Preparing the SRX650 Services Gateway for Rack-Mount Installation on page 69
- Connecting the SRX650 Services Gateway to the Building Structure on page 69

Preparing the SRX650 Services Gateway for Rack-Mount Installation

You can mount an SRX650 Services Gateway on four-post (telco) racks, enclosed cabinets, and open-frame racks. Center-mount racks are not supported.

Before mounting the SRX650 Services Gateway in a rack:

- Verify that the site meets the requirements described in “Site Preparation Checklist for the SRX650 Services Gateway” on page 39.

- Verify that you have the following parts available in your rack-mounting kit for the SRX650 Services Gateway:
  - Rack-mounting brackets
  - Screws

- Verify that the racks or cabinets meet the specific requirements described in “SRX650 Services Gateway Rack Size and Strength Requirements” on page 47.

- Place the rack or cabinet in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure. For more information, see “SRX650 Services Gateway Cabinet Airflow Requirements” on page 52.

- Remove the gateway chassis from the shipping carton. For unpacking instructions, see “Unpacking the SRX650 Services Gateway” on page 65.

Connecting the SRX650 Services Gateway to the Building Structure

Always secure the rack in which you are installing the SRX650 Services Gateway to the structure of the building. If your geographical area is subject to earthquakes, bolt the rack to the floor. For maximum stability, also secure the rack to ceiling brackets.
Related Documentation

- General Site Installation Guidelines for the SRX650 Services Gateway on page 41
- SRX650 Services Gateway Cabinet Size and Clearance Requirements on page 51
- SRX650 Services Gateway Rack Size and Strength Requirements on page 47
- Site Preparation Checklist for the SRX650 Services Gateway on page 39
- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
CHAPTER 15

Installing the Services Gateway

- Installation Instructions Warning on page 71
- Installing the SRX650 Services Gateway in a Rack on page 72
- Installing the Fan Tray on the SRX650 Services Gateway on page 73
- Installing the Air Filter on the SRX650 Services Gateway on page 74
- Installing the SRE on the SRX650 Services Gateway on page 75
- Installing an AC Power Supply on the SRX650 Services Gateway on page 77
- Installing a DC Power Supply on the SRX650 Services Gateway on page 78

**Installation Instructions Warning**

**WARNING:** Read the installation instructions before you connect the services gateway to a power source.

- **Waarschuwing** Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.
- **Varoitus** Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.
- **Attention** Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.
- **Warnung** Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.
- **Avvertenza** Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.
- **Advarsel** Les installasjonsinstruksjonene før systemet kobles til strømkilden.
- **Aviso** Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.
- **¡Atención!** Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

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Installing the SRX650 Services Gateway in a Rack

You can front-mount the SRX650 Services Gateway in a rack. The mounting brackets are an optional accessory. Many types of racks are acceptable, including four-post (telco) racks, enclosed cabinets, and open-frame racks.

NOTE: If you are installing multiple devices in one rack, install the lowest one first and proceed upward in the rack.

To install the services gateway in a rack:

1. Position a mounting bracket on each side of the chassis.

2. Use a number 2 Phillips screwdriver to install the screws that secure the mounting brackets to the chassis.

3. Have one person grasp the sides of the services gateway, lift it, and position it in the rack.

4. Align the bottom hole in each mounting bracket with a hole in each rack rail, making sure the chassis is level.

5. Have a second person install a mounting screw into each of the two aligned holes. Use a number 2 Phillips screwdriver to tighten the screws.

6. Install the second screw in each mounting bracket.

7. Verify that the mounting screws on one side of the rack are aligned with the mounting screws on the opposite side and that the services gateway is level.
Installing the Fan Tray on the SRX650 Services Gateway

To install the fan tray, perform the following steps:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Grasp the fan tray handle and insert it straight into the chassis. Note the correct orientation by the this side up label on the top surface of the fan tray. See Figure 13 on page 73.

3. Use a number 2 Phillips screwdriver to tighten the center screw on the fan tray faceplate to secure it to the chassis.

Figure 13: Installing the Fan Tray

Related Documentation

- SRX650 Services Gateway Spacing of Mounting Bracket and Flange Holes on page 47
- Removing the Fan Tray on the SRX650 Services Gateway on page 151
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
Installing the Air Filter on the SRX650 Services Gateway

To install the air filter:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Locate the up arrow and ensure that the air filter is right side up.

3. Slide the air filter straight into the chassis until it stops (see Figure 14 on page 74).  

   Figure 14: Installing the Air Filter

4. Align the captive screws of the handle with the mounting holes on the chassis.

5. Use a number 1 Phillips screwdriver to tighten both captive screws on the handle (see Figure 15 on page 75).
Related Documentation

- Removing the Air Filter on the SRX650 Services Gateway on page 152
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141

Installing the SRE on the SRX650 Services Gateway

The SRE installs at the back panel of the chassis in the horizontal slots labeled SRE0 or SRE1.0/1.1.

**CAUTION:** The SRE is not hot-swappable. You must power off the services gateway before removing or inserting an SRE.

To install the SRE:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

2. Power off the services gateway.

3. If a blank panel is installed in the SRE slot, remove it.

4. Carefully align the sides of the SRE with the guides inside the chassis. Also ensure that the locking levers on each side of the SRE are in the open position.
5. Slide the SRE into the chassis until you feel resistance, carefully ensuring that it is correctly aligned (see Figure 16 on page 76).

6. With your thumbs, push the locking levers into place to fully lock the SRE into the slot.

**WARNING:** If the locking levers are not aligned properly with the edge of the SRE slot, the SRE will not be properly seated into the SRE backplane receptacle.

7. Use a number 2 Phillips screwdriver to tighten the captive screws on each side of the locking levers.

8. Power on the services gateway and verify that the SRE LED indicators on the chassis and the SRE LED are green.

*Figure 16: Installing the Services and Routing Engine (SRE)*

**Related Documentation** -
- SRX650 Services Gateway Back Panel on page 24
- Removing the SRE from the SRX650 Services Gateway on page 143
- SRX650 Services Gateway Services and Routing Engine 6 on page 11
- Powering On the SRX650 Services Gateway on page 94
Installing an AC Power Supply on the SRX650 Services Gateway

To install an AC power supply:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Using both hands, slide the power supply straight into the chassis until the power supply is fully seated in the chassis slot. The power supply faceplate should be flush with any adjacent power supply faceplate (see Figure 17 on page 77).

3. Attach the power cord to the power supply.

4. Route the power cord along the cable restraint toward the left or right corner of the chassis. If they are needed to hold the power cord in place, thread plastic cable ties, which you must provide, through the openings on the cable restraint.

5. Attach the power cord to the AC power source, and switch on the dedicated facility circuit breaker for the power supply. Follow the ESD and connection instructions for your site. If the power supply is correctly installed and functioning normally, the POWER LED lights steadily.

Figure 17: Installing an AC Power Supply on the SRX650 Services Gateway

Related Documentation

- Removing an AC Power Supply from the SRX650 Services Gateway on page 145
- Connecting an AC Power Cord to the SRX650 Services Gateway on page 92
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
Installing a DC Power Supply on the SRX650 Services Gateway

To install a DC 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. 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 off position (O), and tape the switch handle of the circuit breaker in the off position.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

3. Orient the power supply so that the locking lever is on the left as shown in Figure 18 on page 78.

Figure 18: Installing a DC Power Supply on an SRX650 Services Gateway

4. Using both hands, slide the power supply straight into the chassis until the power supply is fully seated in the chassis slot. The power supply faceplate should be flush with any adjacent power supply faceplate.

5. Tighten the captive screws on the lower edge of the power supply faceplate.

6. Remove the clear plastic cover protecting the terminal studs on the faceplate.
7. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify that the ohm output of the –48V and RTN DC cables to chassis ground. The cable with very large resistance (indicating an open circuit) to chassis ground will be –48V and the cable with very low resistance (indicating a closed circuit) to chassis ground will be RTN.

**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.

8. Using a number 2 Phillips screwdriver, remove the screws and square washers from the terminal studs.

9. Secure each power cable lug to the terminal studs, first with the square washer, then with the screw. Apply between 23 lb-in. (2.6 Nm) and 25 lb-in. (2.8 Nm) of torque to each screw.
   a. Attach the positive (+) DC source power cable lug to the RTN (return) terminal.
   b. Attach the negative (–) DC source power cable lug to the –48V (input) terminal.

10. Replace the clear plastic cover over the terminal studs on the faceplate.

11. Verify that the power cables are connected correctly, that they are not touching or blocking access to services gateway components, and that they do not drape where people could trip on them.

12. Remove the tape from the switch handle of the circuit breaker on the panel board that services the DC circuit and switch the circuit breaker to the on position ( ). Observe the status LEDs on the power supply faceplate. If the power supply is correctly installed and functioning normally, the POWER LED lights green steadily on the services gateway front panel.

**NOTE:** If more than one power supply is being installed, turn on all power supplies at the same time.

**Related Documentation**
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
• Removing a DC Power Supply on the SRX650 Services Gateway on page 147
• Removing a DC Power Supply Cable from the SRX650 Services Gateway on page 148
CHAPTER 16

Grounding the SRX650 Services Gateway

- Required Tools and Parts for Grounding, Powering On, and Powering Off the SRX650 Services Gateway on page 81
- SRX650 Services Gateway Grounding Specifications on page 81
- Grounding the SRX650 Services Gateway on page 82

Required Tools and Parts for Grounding, Powering On, and Powering Off the SRX650 Services Gateway

To ground and to provide power to the services gateway, you need Phillips (+) screwdrivers, numbers 1 and 2.

Related Documentation

- Grounding the SRX650 Services Gateway on page 82
- Powering On the SRX650 Services Gateway on page 94
- Powering Off the SRX650 Services Gateway on page 95
- Organizing Interface Cables on the SRX650 Services Gateway on page 85
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165

SRX650 Services Gateway Grounding Specifications

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, the SRX650 Services Gateway must be adequately grounded before power is connected. You must provide a grounding lug to connect the services gateway to earth ground.

WARNING: Before services gateway installation begins, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the services gateway (for example, by causing a short circuit).

To ground the services gateway before connecting power, you connect the grounding cable to earth ground and then attach the lug on the cable to the chassis grounding point, using the screw.
Table 23 on page 82 lists the specifications of the grounding cable used with the device.

Table 23: Grounding Cable Specifications for the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>Grounding Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grounding cable</td>
<td>8 AWG wire cable</td>
</tr>
<tr>
<td>Amperage of grounding cable</td>
<td>Up to 25A</td>
</tr>
<tr>
<td>Grounding lug</td>
<td>Panduit LCCX8-14A-L ground lug, or equivalent</td>
</tr>
</tbody>
</table>

**CAUTION:** For the NEBS compliant installation in an AC or DC system, use a ground wire of at least 8 American Wire Gauge (AWG). The ground wire must have an agency-approved crimped two holes connector attached to one end, with the other end attached to the building ground. The connector must be crimped with the proper tool, allowing it to be connected to both ground screws on the enclosure. Before crimping the ground wire into the ground lug (Panduit LCCX8-14A-L), ensure that the bare copper wire is cleaned and antioxidant is applied to the bare wire.

**CAUTION:** To ensure adequate bonding when attaching the ground lug, a minimum of 26.6 in-lbs of torque must be applied to the mounting hardware that is used to attach the ground lug.

**CAUTION:** When making the primary ground connection, metric M5 screws with star/lock washer must be used for anti-rotation. When connecting the device to the rack frame, use thread-forming screws and paint-piercing washers.

**Related Documentation**
- Grounding the SRX650 Services Gateway on page 82
- Connecting the SRX650 Services Gateway to the AC Power Supply on page 91
- Powering On the SRX650 Services Gateway on page 94
- Powering Off the SRX650 Services Gateway on page 95

**Grounding the SRX650 Services Gateway**

You ground the services gateway by connecting a grounding cable to earth ground and then attaching it to the chassis grounding points located on the right side of the device (if you are facing the front of the chassis) using two metric M5 x 0.8, 12 mm long grounding screws.

You must provide the following items:

- Two metric M5 x 0.8, 12 mm long grounding screws
- Grounding cables
- Cable lugs (for example, Panduit LCC6-10A-L)
CAUTION: Before services gateway installation begins, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the services gateway (for example, by causing a short circuit).

To ground the services gateway:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis. For more details, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Ensure that all grounding surfaces are clean and brought to a bright finish before grounding connections are made.

3. Connect the grounding cable to a proper earth ground.

4. Place the grounding cable lugs over the grounding points (sized for metric M5 x 0.8, 12 mm long grounding screws) on the side of the chassis.

5. Secure the grounding cable lugs to the grounding points, first with the washers, then with the screws.

6. Dress the grounding cable and verify that it does not touch or block access to the services gateway components and that it does not drape where people could trip on it.

Related Documentation

- Powering On the SRX650 Services Gateway on page 94
- Powering Off the SRX650 Services Gateway on page 95
- Required Tools and Parts for Grounding, Powering On, and Powering Off the SRX650 Services Gateway on page 81
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
CHAPTER 17

Connecting the SRX650 Services Gateway to External Devices

- Required Tools and Parts for Connecting the SRX650 Services Gateway on page 85
- Organizing Interface Cables on the SRX650 Services Gateway on page 85
- Connecting the Modem to the Console Port on the SRX650 Services Gateway on page 86
- Connecting the CLI at the User End for the SRX650 Services Gateway on page 87
- Connecting the Modem at the SRX650 Services Gateway End on page 88

Required Tools and Parts for Connecting the SRX650 Services Gateway

To connect the services gateway, you need an electrostatic discharge (ESD) grounding wrist strap.

Related Documentation
- Connecting the SRX650 Services Gateway to the AC Power Supply on page 91
- Connecting the SRX650 Services Gateway to the DC Power Supply on page 93
- Organizing Interface Cables on the SRX650 Services Gateway on page 85

Organizing Interface Cables on the SRX650 Services Gateway

Arrange network cables as follows to prevent them from dislodging or developing stress points:

- Secure cables so that they are not supporting their own weight as they hang to the floor.
- Place excess cable out of the way in neatly coiled loops.
- Use fasteners to maintain the shape of cable loops.

Related Documentation
- Connecting the SRX650 Services Gateway to the AC Power Supply on page 91
- Connecting the SRX650 Services Gateway to the DC Power Supply on page 93
Connecting the Modem to the Console Port on the SRX650 Services Gateway

To connect the dial-up modem to the console port on the SRX650 Services Gateway:

1. Turn off power to the services gateway.

2. Turn off the power to the modem.

3. Plug one end of the Ethernet cable into the console port on the services gateway. (Figure 19 on page 86 shows the console cable connector).

4. Plug the other end of the Ethernet cable into the RJ-45 to DB-9 serial port adapter.

   **NOTE:** Most modems have an RS-232 DB-25 connector. You must separately purchase an adapter to connect your modem to the RJ-45 to DB-9 adapter and Ethernet cable.

5. Connect the serial port adapter to a separately purchased DB-9 female to DB-25 male adapter or other adapter appropriate for your modem.

6. Plug the modem adapter into the DB-25 connector on the modem.

7. Connect the modem to your telephone network.

8. Turn on the power to the modem.

9. Power on the services gateway by pressing the Power button on the front of the services gateway. Verify that the POWER LED on the front panel turns green.

**Related Documentation**

- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106
- Connecting the Modem at the SRX650 Services Gateway End on page 88
- Connecting the CLI at the User End for the SRX650 Services Gateway on page 87
Connecting the CLI at the User End for the SRX650 Services Gateway

To connect to the CLI through a dial-up modem connected to the console port on the SRX650 Services Gateway:

1. Connect a modem at your remote location to a management device.

2. Start your asynchronous terminal emulation application (such as Microsoft Windows HyperTerminal) on the management device.

3. Select the COM port to which the modem is connected (for example, COM1).

4. Configure the port settings shown in Table 24 on page 87.

<table>
<thead>
<tr>
<th>Port Settings</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bits per second</td>
<td>9600</td>
</tr>
<tr>
<td>Data bits</td>
<td>8</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
<tr>
<td>Stop bits</td>
<td>1</td>
</tr>
<tr>
<td>Flow control</td>
<td>None</td>
</tr>
</tbody>
</table>

5. In the HyperTerminal window, type AT.

   For more information on the AT commands, see the Initial Configuration for Security Devices.

   An OK response indicates that the modem can communicate successfully with the COM port on the management device.

6. To dial the modem that is connected to the console port on the services gateway, type ATDT remote-modem-number. For example, if the phone number of the modem connected to the console port on the services gateway is 0019785551234, type ATDT 0019785551234.

   The services gateway login prompt appears.

7. Log in as the user root. No password is required at initial connection, but you must assign a root password before you commit any configuration settings.
Connecting the Modem at the SRX650 Services Gateway End

Before you can connect a dial-up modem to the console port on the SRX650 Services Gateway, you must configure the modem to accept a call on the first ring and to accept DTR signals. You must also disable flow control on the modem.

**NOTE:** These instructions use Hayes-compatible modem commands to configure the modem. If your modem is not Hayes-compatible, refer to the documentation for your modem and enter equivalent modem commands.

To configure the modem on the services gateway end:

1. Connect the modem to the management device (a desktop or laptop computer).
2. Power on the modem.
3. From the management device, start your asynchronous terminal emulation application (such as Microsoft Windows HyperTerminal), and select the COM port to which the modem is connected (for example, COM1).
4. Configure the port settings as shown in Table 25 on page 88.

<table>
<thead>
<tr>
<th>Port Settings</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bits per second</td>
<td>9600</td>
</tr>
<tr>
<td>Data bits</td>
<td>8</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
<tr>
<td>Stop bits</td>
<td>1</td>
</tr>
<tr>
<td>Flow control</td>
<td>None</td>
</tr>
</tbody>
</table>
5. In the HyperTerminal window, type **AT**.
   For more information on the AT commands, see the Initial Configuration for Security Devices.
An **OK** response verifies that the modem can communicate successfully with the **COM** port on the management device.

6. To configure the modem to answer a call on the first ring, type **ATS0=1**.

7. To configure the modem to accept modem control DTR signals, type **AT&D1**.

8. To disable flow control, type **AT&K0**.

9. To save modem settings, type **AT&W**.

**Related Documentation**
- Connecting the SRX650 Services Gateway from the CLI Remotely on page 106
- Connecting the Modem to the Console Port on the SRX650 Services Gateway on page 86
- Connecting the CLI at the User End for the SRX650 Services Gateway on page 87
CHAPTER 18

Providing Power to the SRX650 Services Gateway

• Connecting the SRX650 Services Gateway to the AC Power Supply on page 91
• Connecting an AC Power Cord to the SRX650 Services Gateway on page 92
• Connecting the SRX650 Services Gateway to the DC Power Supply on page 93
• Powering On the SRX650 Services Gateway on page 94
• Powering Off the SRX650 Services Gateway on page 95

Connecting the SRX650 Services Gateway to the AC Power Supply

CAUTION: Do not mix AC and DC power supplies within the same services gateway. Damage to the device might occur.

The 645 W AC power supply with PoE support is available for the SRX650 Services Gateway. You connect AC power to the services gateway by attaching the power cord from the AC power source to the AC appliance inlet located on the power supply. The power cord is not provided.

To connect the services gateway to an AC power supply:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the side of the chassis.

2. Locate the power cord or cords you will use to connect the services gateway to AC power.

3. Insert the appliance coupler end of the power cord into the appliance inlet on the power supply.

4. Insert the power cord plug into an external AC power source receptacle.
NOTE: Each power supply must be connected to a dedicated AC power feed and a dedicated external circuit breaker. We recommend that you use a 15 A (250 VAC) minimum, or as permitted by local code.

5. Dress the power cord appropriately. Verify that the power cord does not block the air exhaust and access to services gateway components or drape where people could trip on it.

NOTE: The services gateway must be connected to earth ground during normal operation. The protective earthing terminal on the side of the chassis is provided to connect the services gateway to ground.

CAUTION: We recommend using a surge protector for the power connection.

Related Documentation
- Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway on page 168
- Grounding the SRX650 Services Gateway on page 82
- Organizing Interface Cables on the SRX650 Services Gateway on page 85
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165

Connecting an AC Power Cord to the SRX650 Services Gateway

To connect the AC power cord:

1. Locate a replacement power cord with the type of plug appropriate for your geographical location.

2. Connect the power cord to the power supply.

3. Insert the power cord plug into an external AC power source receptacle.

4. Route the power cord along the cable restraint toward the left or right corner of the chassis. If they are needed to hold the power cord in place, thread plastic cable ties, which you must provide, through the openings on the cable restraint.

5. Verify that the power cord does not block the air exhaust and access to services gateway components, or drape where people could trip on it. If the power supply is correctly installed and functioning normally, the POWER LED lights steadily.
Connecting the SRX650 Services Gateway to the DC Power Supply

**CAUTION:** Do not mix AC and DC power supplies within the same services gateway. Damage to the device might occur.

The 645 W DC power supply with PoE support is available for the SRX650 Services Gateway.

**WARNING:** Before performing the following procedure, 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 (O), and tape the switch handle of the circuit breaker in the off position.

You connect DC power to the device by attaching power cables from the external DC power sources to the terminal studs on the power supply faceplate. You must provide the power cables (the cable lugs are supplied with the services gateway).

To connect the DC source power cables to the services gateway power supply:

1. Switch off the dedicated facility circuit breakers. 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. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the side of the chassis.

3. Remove the clear plastic cover protecting the terminal studs on the faceplate.

4. Verify that the DC power cables are correctly labeled before making connections to the power supply. In a typical power distribution scheme where the return is connected to chassis ground at the battery plant, you can use a multimeter to verify that the ohm output of the $-48\text{V}$ and RTN DC cables to chassis ground. The cable with very large resistance (indicating an open circuit) to chassis ground will be $-48\text{V}$ and the cable with very low resistance (indicating a closed circuit) to chassis ground will be RTN.
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 the power supply.

5. Remove the screws and square washers from the terminals. Use a number 2 Phillips screwdriver.

6. Secure each power cable lug to the terminals, first with the square washer, then with the screw. Apply between 23 lb-in. (2.6 Nm) and 25 lb-in. (2.8 Nm) of torque to each screw.
   - Secure each positive (+) DC source power cable lug to a RTN (return) terminal.
   - Secure each negative (–) DC source power cable lug to a –48V (input) terminal.

7. Replace the clear plastic cover over the terminal studs on the faceplate.

8. Verify that the power cables are connected correctly, that they are not touching or blocking access to services gateway components, and that they do not drape where people could trip on them.

NOTE: The services gateway must be connected to earth ground during normal operation. The protective earthing terminal on the side of the chassis is provided to connect the services gateway to ground.

CAUTION: We recommend using a surge protector for the power connection.

Related Documentation
- Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway on page 168
- Grounding the SRX650 Services Gateway on page 82
- Organizing Interface Cables on the SRX650 Services Gateway on page 85
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165

Powering On the SRX650 Services Gateway

To power on the services gateway:

1. Ensure that you have connected the power supply to the device.
2. Insert the plug of the power supply adapter into an AC or DC power source receptacle.
   a. Using AC Power supply—Insert the appliance coupler end of the power cord into the appliance inlet on the power supply and the power cord plug into an external AC power source receptacle.
   b. Using DC power supply—Connect DC power cables to the A+ and A- terminals and the other ends to an external DC power source. If you have two DC power sources and wish to deploy A/B feed redundancy for the services gateway, also connect DC power cables to the B+ and B- terminals and the other ends to an external DC power source.

   **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 terminals on the power supply.

3. Turn on the power to the AC or DC power receptacle.

The device starts automatically as the power supply completes its startup sequence. The POWER LED (on the front panel of the chassis) lights during startup and remains on steadily when the services gateway is operating normally.

**Related Documentation**
- Grounding the SRX650 Services Gateway on page 82
- Resetting the SRX650 Services Gateway on page 136
- Powering Off the SRX650 Services Gateway on page 95
- SRX650 Services Gateway Front Panel on page 18

**Powering Off the SRX650 Services Gateway**

You can use any of the following methods to power off the services gateway:

- Issue the `request system halt` CLI command (recommended method). Wait until a message appears confirming that the operating system has halted. To remove power completely from the services gateway, unplug the AC power cord or DC power supply cable.

- Press the **Power** button on the front of the services gateway and hold it for 4 seconds. The services gateway begins gracefully shutting down the operating system, the Services and Routing Engine (SRE) and any Gigabit-Backplane Physical Interface Modules (GPIMs), and then powers itself off. To remove power completely from the services gateway, unplug the AC power cord or DC power supply cable.
NOTE: Forced shutdown is not supported on the SRX650 Services Gateway.

After powering off a power supply, wait at least 60 seconds before turning it back on. After powering on a power supply, wait at least 10 seconds before turning it off.

After a power supply is turned on, it can take up to 60 seconds for status indicators—such as the POWER LED (on the front panel of the chassis) and the `show chassis` command display—to indicate that the power supply is functioning normally. Ignore error indicators that appear during the first 60 seconds.

Related Documentation
- Grounding the SRX650 Services Gateway on page 82
- Powering On the SRX650 Services Gateway on page 94
- Resetting the SRX650 Services Gateway on page 136
- SRX650 Services Gateway Front Panel on page 18
Performing Initial Configuration

- SRX650 Services Gateway Software Configuration Overview on page 97
- SRX650 Services Gateway Basic Settings on page 98
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- SRX650 Services Gateway Secure Web Access Overview on page 102
- SRX650 Services Gateway Secure CLI Access Overview on page 103
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106
- Viewing Factory-Default Settings of the SRX650 Services Gateway on page 106
- Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface on page 113
- Displaying Basic Connectivity Configurations for the SRX650 Services Gateway on page 117
- Built-In Ethernet Ports for the SRX650 Services Gateway on page 118

SRX650 Services Gateway Software Configuration Overview

The Juniper Networks Junos operating system (Junos OS) is preinstalled on the SRX650 Services Gateway. When the services gateway is powered on, it is ready to be configured.

If you are setting up a services gateway for the first time, you can use the J-Web setup wizard or the command-line interface (CLI) to perform the initial configuration.

If you are setting up many services gateways, autoinstallation can help automate the configuration process. See “SRX650 Services Gateway Autoinstallation Overview” on page 64.

Before you configure the services gateway for the first time, you should complete the prerequisite tasks listed in Table 26 on page 98.
## Table 26: Services Gateway Prerequisite Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Details</th>
</tr>
</thead>
</table>
| Gather information on: | • Device identification  
  • Hostname for the device on the network  
  • Domain to which the device belongs on the network  
  • Password for the root user  
  • Time zone information  
  • System time and zone for services gateway location  
  • IP address of a Network Time Protocol (NTP) server, if NTP is used to set the time on the services gateway  
  • Network settings for the services gateway:  
    • IP address of a DNS server  
    • List of domains that can be appended to hostnames for DNS resolution |
| If you are performing the initial configuration with the J-Web setup wizard, gather the following equipment: | • Management device, such as a desktop or laptop computer, with an Ethernet port  
  • Ethernet cable |
| If you are performing the initial configuration with the CLI, gather the following equipment: | • Management device, such as a desktop or laptop computer, with a serial port and an asynchronous terminal application (such as Microsoft Windows HyperTerminal)  
  • Serial cable  
  • For a remote connection, gather the following equipment:  
    • Two dial-up modems  
    • An adapter appropriate for your modem; for example, DB-25 male or similar |

### Related Documentation
- SRX650 Services Gateway Basic Settings on page 98
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106

### SRX650 Services Gateway Basic Settings

Table 27 on page 99 provides information on basic connectivity settings.
### Table 27: Services Gateway Basic Connectivity Settings Details

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device identification</td>
<td>The hostname defines the network or subnetwork to which your services</td>
<td>The hostname refers to the specific machine, while the domain name is</td>
</tr>
<tr>
<td></td>
<td>gateway belongs.</td>
<td>shared among all devices in a given network. Together the hostname and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>domain name identify the device in the network.</td>
</tr>
<tr>
<td>Root password</td>
<td>Initially, the root password is not defined on the device. To ensure basic</td>
<td>The root password must meet the following criteria:</td>
</tr>
<tr>
<td></td>
<td>security, you must define the root password during initial configuration. If</td>
<td>• Must be at least six characters long</td>
</tr>
<tr>
<td></td>
<td>a root password is not defined, you cannot commit configuration settings on</td>
<td>• Can include most character classes (alphabetic, numeric, and special</td>
</tr>
<tr>
<td></td>
<td>the device.</td>
<td>characters), except control characters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Must contain at least one change of case or character class</td>
</tr>
<tr>
<td></td>
<td>NOTE: The root password is mandatory.</td>
<td>NOTE: For Common Criteria environments only, the password must be between</td>
</tr>
<tr>
<td></td>
<td>NOTE: If you use a plaintext password, the device displays the password as</td>
<td>10 and 20 characters long and must include at least 3 of the 5 character</td>
</tr>
<tr>
<td></td>
<td>an encrypted string so that users viewing the configuration cannot see it.</td>
<td>classes (uppercase letters, lowercase letters, punctuation marks, numbers,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and other special characters). Control characters are not recommended.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For more information, see the Configuration Guides for Junos OS Public</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sector Certifications.</td>
</tr>
<tr>
<td>Network settings</td>
<td>A Domain Name System (DNS) server on the network maintains a database for</td>
<td>If you plan to include your device in several domains, add these domains</td>
</tr>
<tr>
<td></td>
<td>resolving hostnames and IP addresses. Network devices can query the DNS</td>
<td>to the configuration so that they are included in a DNS search. When DNS</td>
</tr>
<tr>
<td></td>
<td>server by hostnames rather than IP addresses. The services gateway accesses</td>
<td>searches are requested, the domain suffixes are appended to the hostnames.</td>
</tr>
<tr>
<td></td>
<td>the DNS servers that are added to the configuration to resolve hostnames in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the order in which you list them.</td>
<td></td>
</tr>
<tr>
<td>Default gateway</td>
<td>A default gateway is a static route that is used to direct packets addressed</td>
<td>The default gateway entry is always present in the routing and forwarding</td>
</tr>
<tr>
<td></td>
<td>to networks not explicitly listed in the routing table. If a packet arrives</td>
<td>tables.</td>
</tr>
<tr>
<td></td>
<td>at the services gateway with an address for which the device does not have</td>
<td></td>
</tr>
<tr>
<td></td>
<td>routing information, the services gateway sends the packet to the default</td>
<td></td>
</tr>
<tr>
<td></td>
<td>gateway.</td>
<td></td>
</tr>
<tr>
<td>Time zone and system</td>
<td>You define the time zone for the location where you plan to operate the</td>
<td>A Network Time Protocol (NTP) server provides accurate time across a</td>
</tr>
<tr>
<td>time</td>
<td>services gateway by using a designation that consists of the following</td>
<td>network. The device synchronizes the system time with the NTP server and</td>
</tr>
<tr>
<td></td>
<td>information for the location:</td>
<td>periodically accesses the NTP server to maintain the correct time.</td>
</tr>
<tr>
<td></td>
<td>• Name of the continent or ocean—for example, America or Pacific</td>
<td>The time zone and system time must be accurate so that the device</td>
</tr>
<tr>
<td></td>
<td>• Name of the major city or other geographic feature in the time zone—for</td>
<td>schedules events and operations as expected.</td>
</tr>
<tr>
<td></td>
<td>example, Boston or Azores</td>
<td>NOTE: For Common Criteria compliance, you must configure NTP to provide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>accurate timestamps for system log messages. For more information, see the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Configuration Guides for Junos OS Public Sector Certifications.</td>
</tr>
</tbody>
</table>

NOTE: For Common Criteria on the services gateway, the configuration must be compliant with the Common Criteria profile.
### Table 27: Services Gateway Basic Connectivity Settings Details (continued)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup device</td>
<td>NOTE: This feature will be supported in a future release.</td>
<td>NOTE: The backup device must be located on the same subnet as the primary device.</td>
</tr>
<tr>
<td></td>
<td>You can specify a backup device to take over when the routing protocol process of the services gateway is not running:</td>
<td>To configure a backup device, you must use the CLI. You cannot configure a backup device using J-Web.</td>
</tr>
<tr>
<td></td>
<td>• When the services gateway is starting.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• When its routing protocol process has failed. In this situation, packets arriving at a services gateway are routed to the backup device. When the routing protocol process starts up again, the address of the backup device is removed from the routing and forwarding tables of the services gateway.</td>
<td></td>
</tr>
</tbody>
</table>

### Related Documentation
- SRX650 Services Gateway Software Configuration Overview on page 97
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106

### Connecting to the SRX650 Services Gateway Setup Wizard

If you plan to use the setup wizard to configure the SRX650 Services Gateway, you must connect through the built-in Ethernet port 0/1 as shown in Figure 20 on page 100.

*Figure 20: Connecting to the Ethernet Port on the SRX650 Services Gateway*
To enable communication between the management device and the services gateway, port 0/1 is preconfigured with the IP address 192.168.1.1 and uses DHCP to assign an IP address in the 192.168.1.0/24 network to any connected device.

To connect a management device to built-in Ethernet port 0/1:

1. Ensure that the IP address for the Ethernet port on the management device is configured in one of the following ways:
   - The IP address is assigned by DHCP.
   - The IP address is on the 192.168.1.0/24 subnetwork (but is not 192.168.1.1).

2. Turn off the power to the management device.

3. Plug one end of the Ethernet cable (Figure 21 on page 101 shows the connector) into the Ethernet port on the management device.

   Figure 21: Ethernet Cable Connector (RJ-45)

4. Connect the other end of the Ethernet cable to built-in Ethernet port 0/1 on the services gateway.

5. Power on the services gateway by connecting the power cord or by pressing the Power button on the front of the services gateway.

6. Wait until the STATUS LED on the front panel turns solid green.

7. Turn on the power to the management device. The services gateway assigns an IP address to the management device within the 192.168.1.0/24 subnetwork if the management device is configured to use DHCP.

8. To access the setup wizard, open a Web browser on the management device and enter the IP address 192.168.1.1 in the address field.

9. Specify the default username as root. Do not enter any value in the Password field.


   NOTE: The upper left area of the wizard page shows where you are in the setup process. Click a field in the wizard page to display information about that field in the lower left area of the page.
11. Use the wizard to configure basic settings such as Hostname, Domain Name, and Root Password for your services gateway. You may also use the wizard to configure a default gateway, DNS servers, domain search, VLANs, interfaces, and J-Web preferences. For details on using the J-Web setup wizard to configure basic settings for the services gateway, see “Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface” on page 113.

12. Click **Commit** to apply the configuration. After configuring the basic settings, you are prompted to log out. Relaunch the page to see the settings and continue working in J-Web.

**NOTE:** You must manually configure the IP address for the management port that you are using before you save your initial configuration. When you save the configuration for the first time, you will lose the connection to the services gateway if you have not manually configured the IP address. If you lose the connection through the management interface, you must connect through the console port.

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**Related Documentation**

- *Performing Initial Software Configuration on the SRX650 Services Gateway Using the Setup Wizard*
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106

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**SRX650 Services Gateway Secure Web Access Overview**

You can manage a services gateway remotely through the J-Web interface. To communicate with the services gateway, the J-Web interface uses Hypertext Transfer Protocol (HTTP). HTTP allows easy Web access but does not include encryption. The data transmitted between the client and the services gateway by means of HTTP is vulnerable to interception and attack. To enable secure Web access, a services gateway supports HTTP over Secure Sockets Layer (HTTPS). You can enable HTTP or HTTPS access on specific interfaces and ports as needed.

The services gateway uses the SSL protocol to provide secure management of services gateways through the J-Web interface. SSL uses public-private key technology, which requires a paired private key and an authentication certificate to provide the SSL service. SSL encrypts communication between your device and the Web browser with a session key negotiated by the SSL server certificate.

An SSL certificate includes identifying information such as a public key and a signature made by a certificate authority (CA). When you access the services gateway through HTTPS, an SSL handshake authenticates the server and the client and begins a secure session. If the information does not match or if the certificate has expired, your access to the services gateway through HTTPS is restricted.
Without SSL encryption, communication between your services gateway and the browser is sent in the open and can be intercepted. We recommend that you enable HTTPS access on your WAN interfaces.

On services gateways, HTTP access is enabled by default on the built-in management interfaces. By default, HTTPS access is supported on any interface with an SSL server certificate.

You can use the J-Web interface or the CLI to configure secure Web access.

Before you configure secure Web access for the first time, you must complete the following tasks:

- Establish basic connectivity.
- Obtain an SSL certificate from a trusted signing authority.

For more details about configuring secure web access on your services gateway, see the Initial Configuration for Security Devices.

Related Documentation
- SRX650 Services Gateway Software Configuration Overview on page 97
- Performing Initial Software Configuration on the SRX650 Services Gateway Using the Setup Wizard
- Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface on page 113

SRX650 Services Gateway Secure CLI Access Overview

Telnet allows you to connect to the SRX650 Services Gateway and access the CLI to execute commands from a remote system. Telnet connections are not encrypted and therefore can be intercepted.

NOTE: Telnet access to the root account is prohibited. You must use more secure methods, such as SSH, to log in as root.

SSH provides the following features:

- Allows you to connect to the services gateway and to access the CLI to execute commands from a remote system
- Unlike Telnet, encrypts traffic so that it cannot be intercepted
- Can be configured so that connections are authenticated by a digital certificate
- Uses public–private key technology for both connection and authentication

The SSH client software must be installed on the machine where the client application runs. If the SSH private key is encrypted (for greater security), the SSH client must be able to access the passphrase used to decrypt the key.

If you are using a Junos XML protocol server to configure and monitor devices, you can activate cleartext access on the services gateway to allow unencrypted text to be sent directly over a TCP connection without using any additional protocol (such as SSH, SSL, or Telnet). For more information about the Junos XML management protocol, see the Junos XML Management Protocol Guide.

**NOTE:** Information sent in cleartext is not encrypted and therefore can be intercepted.

If the services gateway is operating in a Common Criteria environment, see the Configuration Guides for Junos OS Public Sector Certifications.

**Related Documentation**
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106
- SRX650 Services Gateway Software Configuration Overview on page 97

**Connecting to the SRX650 Services Gateway from the CLI Locally**

If you plan to use the CLI to configure the SRX650 Services Gateway, you must connect through the console port, as shown in Figure 22 on page 104.

*Figure 22: Connecting to the Console Port on the SRX650 Services Gateway*
NOTE: Figure 22 on page 104 shows a connection to a local management device. A remote connection to the services gateway through a modem requires the cable and connector shown (RJ-45 to a DB-9 serial port adapter), along with an adapter for your modem, which you must purchase separately.

To connect to the CLI using a local management device through the console port on the services gateway:

1. Turn off power to the services gateway.

2. Turn off power to the management device (such as a desktop or laptop computer) that you are using to access the CLI.

3. Plug one end of the Ethernet cable into the RJ-45 to DB-9 serial port adapter (see Figure 22 on page 104).

4. Plug the RJ-45 to DB-9 serial port adapter into the serial port on the management device (see Figure 22 on page 104).

5. Connect the other end of the Ethernet cable to the console port on the services gateway (see Figure 22 on page 104).

6. Turn on the power to the management device.

7. Start your asynchronous terminal emulation application (such as Microsoft Windows HyperTerminal), and select the appropriate COM port to use (for example, COM1).

8. Configure the port settings as shown in Table 28 on page 105.

<table>
<thead>
<tr>
<th>Port Settings</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bits per second</td>
<td>9600</td>
</tr>
<tr>
<td>Data bits</td>
<td>8</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
<tr>
<td>Stop bits</td>
<td>1</td>
</tr>
<tr>
<td>Flow control</td>
<td>None</td>
</tr>
</tbody>
</table>

9. Power on the services gateway by pressing the Power button on the front of the services gateway. Verify that the POWER LED on the front panel turns green.
The terminal emulation screen on your management device displays the startup sequence. When the services gateway has finished starting up, a login prompt appears.

10. Log in as the user **root**. No password is required at initial connection, but you must assign a root password before committing any configuration settings.

**Related Documentation**
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106

## Connecting to the SRX650 Services Gateway from the CLI Remotely

You can connect an SRX650 Services Gateway to the CLI from a remote location through two dial-up modems:

- A modem that is connected to the console port on the services gateway
- A second modem that is connected to a remote management device

The modem connection lets you remotely perform the same console operations that you can perform locally.

**Related Documentation**
- Connecting the Modem at the SRX650 Services Gateway End on page 88
- Connecting the Modem to the Console Port on the SRX650 Services Gateway on page 86
- Connecting the CLI at the User End for the SRX650 Services Gateway on page 87

## Viewing Factory-Default Settings of the SRX650 Services Gateway

To view the factory-default configuration of the services gateway using the CLI:

1. Verify that the services gateway is powered on.

2. Log in as the root user and provide your credentials.

3. In shell mode, navigate to the `/etc/config` folder.
   
   ```
   % cd /etc/config
   ```

4. View the list of default config files.
   
   ```
   % ls
   ```

The following sample output displays the list of factory-default configuration files:

```
j-series-defaults.conf                srx210h-defaults.conf
jsrxsme-series-defaults.conf          srx210h-factory.conf
jsrxsme-series-factory.conf          srx210h-poe-defaults.conf
```
View the required default config file.

```
% vi config file name
```

For example, enter the following command to view the default configuration file for the SRX240 Services Gateway.

```
% vi srx240-poe-16xge-factory.conf
```

The following sample output displays the factory-default configuration on an SRX240 Services Gateway:

```
##
## $Id: $
##
## Copyright (c) 2009, Juniper Networks, Inc.
## All rights reserved.
##
```
system {
  autoinstallation {
  delete-upon-commit;
  traceoptions {
    level verbose;
    flag {
      all;
    } }
  }
  interfaces {
    ge-0/0/0 {
      bootp;
    }
  }
}

services {
  ssh;
  telnet;
  dhcp {
    router {
      192.168.1.1;
    }
    pool 192.168.1.0/24 {
      address-range low 192.168.1.2 high 192.168.1.254;
    }
    propagate-settings ge-0/0/0.0;
  }
  web-management {
    http {
      interface [vlan.0];
    }
    https {
      system-generated-certificate;
      interface [vlan.0];
    }
  }
  xnm-clear-text;
}

name-server {
  208.67.222.222;
  208.67.220.220;
}

syslog {
  archive size 100k files 3;
}

interfaces {
  ge-0/0/0 {
    unit 0;
  }
  ge-0/0/1 {
    unit 0 {
      family ethernet-switching {
        vlan {
          members vlan-trust;
        }
      }
    }
  }
}
ge-0/0/2 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}

ge-0/0/3 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}

ge-0/0/4 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}

ge-0/0/5 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}

ge-0/0/6 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}

ge-0/0/7 {
  unit 0 {
    family ethernet-switching {
      vlan {
        members vlan-trust;
      }
    }
  }
}
ge-0/0/8 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/9 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/10 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/11 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/12 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/13 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}
ge-0/0/14 {

unit 0 {
    family ethernet-switching {
        vlan {
            members vlan-trust;
        }
    }
}

ge-0/0/15 {
    unit 0 {
        family ethernet-switching {
            vlan {
                members vlan-trust;
            }
        }
    }
}

vlan {
    unit 0 {
        family inet {
            address 192.168.1.1/24;
        }
    }
}

poe {
    interface all;
}

security {
    nat {
        source {
            rule-set trust-to-untrust {
                from zone trust;
                to zone untrust;
                rule source-nat-rule {
                    match {
                        source-address 0.0.0.0/0;
                    }
                    then {
                        source-nat {
                            interface;
                        }
                    }
                }
            }
        }
    }
}

screen {
    ids-option untrust-screen {
        icmp {
            ping-death;
        }
        ip {
            source-route-option;
            tear-drop;
        }
        tcp {

syn-flood {
  alarm-threshold 1024;
  attack-threshold 200;
  source-threshold 1024;
  destination-threshold 2048;
  timeout 20;
}
land;
}
}
}
}
zones {
  security-zone trust {
    host-inbound-traffic {
      system-services {
        all;
      }
      protocols {
        all;
      }
    }
    interfaces {
      vlan.0;
    }
  }
  security-zone untrust {
    interfaces {
      ge-0/0/0.0 {
        host-inbound-traffic {
          system-services {
            dhcp;
            tftp;
          }
        }
      }
    }
    screen untrust-screen;
  }
}
policies {
  from-zone trust to-zone untrust {
    policy trust-to-untrust {
      match {
        source-address any;
        destination-address any;
        application any;
      }
      then {
        permit;
      }
    }
  }
}
vlans {
  vlan-trust {
    vlan-id 3;
    l3-interface vlan.0;
  }
}
protocols {
Related Documentation

- SRX650 Services Gateway Autoinstallation Overview on page 64
- SRX650 Services Gateway Software Configuration Overview on page 97
- Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface on page 113

Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface

This topic describes how to configure basic settings for your services gateway using either the CLI or the J-Web setup wizard.

To configure basic settings on an SRX650 Services Gateway:

1. Identify the services gateway.

2. Connect it to the network.

3. Configure basic network settings.

In a typical network, the services gateway has the basic settings listed in Table 29 on page 113. Determine the values to set on the services gateway in your network.

Table 29: Sample Settings on the SRX650 Services Gateway

<table>
<thead>
<tr>
<th>SRX650 Services Gateway Property</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services gateway hostname</td>
<td>devicea</td>
</tr>
<tr>
<td>IP address for default gateway</td>
<td>10.0.0.1/24</td>
</tr>
<tr>
<td>IP address of the NTP server used to synchronize system time</td>
<td>10.148.2.21</td>
</tr>
<tr>
<td>IP address of the DNS server to which DNS requests are sent</td>
<td>10.148.2.32</td>
</tr>
<tr>
<td>Domains to which the services gateway belongs</td>
<td>lab.device.net and device.net</td>
</tr>
</tbody>
</table>

You can configure basic settings for the services gateway using either the J-Web setup wizard or CLI as the configuration editor. Table 30 on page 114 summarizes the configuration tasks for the initial setup for both required and optional settings.
Table 30: Configuring Basic Settings

<table>
<thead>
<tr>
<th>Task</th>
<th>Required or Optional</th>
<th>Using the J-Web Setup Wizard</th>
<th>Using the CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigate to the top of the configuration hierarchy in the CLI. From the <code>[edit]</code> hierarchy level, type: <code>edit system</code></td>
<td>Required</td>
<td>After establishing basic connectivity and entering <code>root</code> as the default username (see “Connecting to the SRX650 Services Gateway Setup Wizard” on page 100), click Enter. The J-Web setup wizard appears. Click Start at the bottom of the Introduction page.</td>
<td>Navigate to the top of the configuration hierarchy in the CLI. From the <code>[edit]</code> hierarchy level, type: <code>edit system</code></td>
</tr>
<tr>
<td>Define the hostname of the services gateway.</td>
<td>Required</td>
<td>On the Configure System: Identification page, type the hostname of the services gateway; for example, <code>devicea</code>.</td>
<td>Specify the hostname. For example: <code>set host-name devicea</code></td>
</tr>
<tr>
<td>Identify the domain name of the network or subnetwork to which the services gateway belongs.</td>
<td>Required</td>
<td>From the Configure System: Identification page, type the domain name of the services gateway; for example, <code>lab.device.net</code>.</td>
<td>Specify the domain name. For example: <code>set domain-name lab.device.net</code></td>
</tr>
<tr>
<td>Define the root password for the user with unrestricted access to the services gateway.</td>
<td>Required</td>
<td>1. On the Configure System: Identification page, type the root password, for example <code>ssh-rsa AAAAB3Nza...D9Y2gXF9ac== root@devicea.lab.device.net</code> 2. Retype the password in the Verify root password field.</td>
<td>Specify the root password. For example: <code>set root-authentication ssh-rsa &quot;ssh-rsa AAAAB3Nza...D9Y2gXF9ac== root@devicea.lab.device.net&quot;</code></td>
</tr>
</tbody>
</table>
| Define the IP address of the default gateway. The default gateway is the IP address and subnet of the next-hop router, which is generally provided by the ISP for a branch office. | Optional | From the Configure System: Network Settings page, type the IP address of the default gateway; for example, `10.0.0.1/24`. | Set the default gateway IP address and the next-hop router address. For example: `set interfaces ge-0/0/1 unit 0 family inet address 10.0.0.1/24` `set routing-options static route 0.0.0.0/0 next-hop 10.0.0.2` **NOTE**: The example assumes that the next-hop router address is 10.0.0.2.
Table 30: Configuring Basic Settings (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Required or Optional</th>
<th>Using the J-Web Setup Wizard</th>
<th>Using the CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add the names of servers that maintain databases for resolving hostnames and IP addresses.</td>
<td>Optional</td>
<td>From the Configure System: Network Settings page, type the IP address of the DNS server; for example, 10.148.2.32. Then click Add.</td>
<td>Specify the address of the DNS server. For example: set name-server 10.148.2.32</td>
</tr>
<tr>
<td>Add each domain to which the services gateway belongs, to include it in a DNS search.</td>
<td>Optional</td>
<td>From the Configure System: Network Settings page, type the domains to be searched; for example, lab.device.net and device.net. Then click Add after each one you add to the list.</td>
<td>Specify the domains to be searched. For example: set domain-search lab.device.net set domain-search device.net</td>
</tr>
<tr>
<td>Configure interface groups (VLANs).</td>
<td>Optional</td>
<td>From the Interface Groups (VLANs) page, click Add, Edit, or Delete to configure VLANs.</td>
<td>Specify a VLAN interface. For example: set interfaces ge-0/0/1 unit 0 family inet address 10.148.1.32</td>
</tr>
<tr>
<td>Configure interfaces other than VLANs.</td>
<td>Optional</td>
<td>From the Configure Interfaces page, click Add, Edit, or Delete to configure interfaces other than VLANs.</td>
<td>Specify an interface other than a VLAN interface. For example: set interfaces ge-0/0/2 unit 0 family inet address 10.148.5.32</td>
</tr>
<tr>
<td>Specify the tab you want to appear on startup.</td>
<td>Required</td>
<td>From the Configure J-Web Preferences page, from the J-Web starting page options, select the tab you want to appear on startup.</td>
<td>N/A</td>
</tr>
<tr>
<td>The Configure J-Web Preferences page appears before the Configure System: Time page in the wizard. Specify when you want commit to occur.</td>
<td>Required</td>
<td>From the Configure J-Web Preferences page, from the J-Web commit options, specify when you want commit to occur.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table 30: Configuring Basic Settings (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Required or Optional</th>
<th>Using the J-Web Setup Wizard</th>
<th>Using the CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define the current system time and time zone in which the services gateway is located.</td>
<td>Optional</td>
<td>1. From the Configure System: Time page, click <strong>Reset Manually</strong> to reset the time.</td>
<td>Specify the time zone. For example: <code>set time-zone America/Los_Angeles</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. From the Time Zone list, select the time zone for your services gateway; for example, <code>America/Los_Angeles</code></td>
<td></td>
</tr>
<tr>
<td>Define the NTP server that the services gateway can reach to synchronize the system time.</td>
<td>Optional</td>
<td>From the Configure System: Time page, in the NTP Servers field, type the NTP server's IP address; for example, <code>10.148.2.21</code>.</td>
<td>Specify the address of the NTP server. For example: <code>set ntp server 10.148.2.21</code></td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>Required</td>
<td>Review the configuration on the Review &amp; Commit page. Click <strong>Commit</strong> to save the configuration, or click <strong>Back</strong> to make changes.</td>
<td>Commit and save your configuration. For example: <code>commit</code></td>
</tr>
</tbody>
</table>

**NOTE:** After basic setup is configured, the J-Web setup wizard will no longer be available unless you reset the services gateway to the factory default settings and reboot it. You can perform additional setup by using the J-Web interface or the CLI interface. You can use wizards to configure basic firewall policies, VPN settings, and NAT rules. For more information about these wizards, see the Security Basics.

For more instructions on managing users and operations, monitoring network performance, upgrading software, and diagnosing common problems on an SRX650 Services Gateway, see the Monitoring and Troubleshooting for Security Devices.

**Related Documentation**
- SRX650 Services Gateway Software Configuration Overview on page 97
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106
- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Displaying Basic Connectivity Configurations for the SRX650 Services Gateway on page 117
Displaying Basic Connectivity Configurations for the SRX650 Services Gateway

To verify that the SRX650 Services Gateway has the settings you configured, you should display the basic connectivity configurations. Because the basic connectivity settings appear in different places in the configuration hierarchy, displaying the entire configuration at once makes viewing the settings easier.

To display and verify the basic connectivity settings, select **Configure > System Properties > System Identity**. Alternatively, from configuration mode in the CLI, enter the **show** command. Review the following sample output. Your output displays the values you set.

```
[edit]
user@host# show
system {
  host-name devicea;
  domain-name lab.device.net;
  domain-search [ lab.device.net device.net ];
  time-zone America/Boston;
  root-authentication {
    ssh-rsa "ssh-rsa AAAAB3Nza...D9Y2gXF9ac==root@devicea.lab.device.net";
  }
  name-server {
    10.148.2.32;
  }
  services {
  }
  ntp {
    server 10.148.2.21;
  }
}
interfaces {
  ge-0/0/0 {
    unit 0 {
      family inet {
        address 10.157.71.12/19;
      }
    }
  } lo0 {
    unit 0 {
      family inet {
        address 127.0.0.1/32;
        address 10.254.71.12/32 {
          primary;
        }
      } family iso {
        address 47.0005.80ff.f800.0000.0108.0001.0102.5407.1012.00;
      }
    } family inet6 {
      address abcd::10:254:71:12/128 {
        primary;
      }
    }
```
The output shows a basic connectivity configuration. Verify that the values displayed are correct for your services gateway.

**Related Documentation**
- SRX650 Services Gateway Software Configuration Overview on page 97
- Performing Initial Software Configuration on the SRX650 Services Gateway Using the Setup Wizard
- Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface on page 113

**Built-In Ethernet Ports for the SRX650 Services Gateway**

You perform initial device setup through the four built-in Gigabit Ethernet ports, ge-0/0/0 through ge-0/0/3, on the front panel of the SRX650 Services Gateway.

**NOTE:** If chassis clustering is enabled, we recommend using the ge-0/0/0 port as the management port (fxp0) and using the ge-0/0/1 port (if used) as the control port (fxp1). The fpx0 and fpx1 ports are created only when chassis clustering is enabled. You can use the other ports as fabric ports.

Before initial configuration, when the factory default configuration is active, the services gateway attempts to perform autoinstallation by obtaining a device configuration through all its connected interfaces, including ge-0/0/0. All interfaces are configured as Layer 3 interfaces. See Table 31 on page 118 for the default interface configuration.

**Table 31: Default Interface Configuration for the Services Gateway**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Security Zone</th>
<th>DHCP State</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ge-0/0/0</td>
<td>Untrust</td>
<td>Client</td>
<td>Dynamically assigned</td>
</tr>
<tr>
<td>ge-0/0/1 (if used)</td>
<td>Trust</td>
<td>Server</td>
<td>192.168.1.1/24</td>
</tr>
<tr>
<td>ge-0/0/2 (if used)</td>
<td>Trust</td>
<td>Server</td>
<td>192.168.2.1/24</td>
</tr>
</tbody>
</table>

**NOTE:** Use this port as a fabric port.
Table 31: Default Interface Configuration for the Services Gateway (continued)

<table>
<thead>
<tr>
<th>Interface</th>
<th>Security Zone</th>
<th>DHCP State</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ge-0/0/3 (if used)</td>
<td>Trust</td>
<td>Server</td>
<td>192.168.3.1/24</td>
</tr>
</tbody>
</table>

*NOTE:* Use this port as a fabric port.

By default, the security policies and NAT rules in Table 32 on page 119 and Table 33 on page 119 are created on the SRX Series security policies.

Table 32: Security Policies

<table>
<thead>
<tr>
<th>Source Zone</th>
<th>Destination Zone</th>
<th>Policy Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>Untrust</td>
<td>Permit</td>
</tr>
</tbody>
</table>

Table 33: NAT Rule

<table>
<thead>
<tr>
<th>Source Zone</th>
<th>Destination Zone</th>
<th>NAT Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>Untrust</td>
<td>Source NAT to untrust zone interface</td>
</tr>
</tbody>
</table>

For example, a common default firewall configuration includes the following assumptions:

- The protected network is connected to the ge-0/0/1 interface and the ge-0/0/2 interface in the trust zone.
- Connectivity to the Internet is through the ge-0/0/0 interface in the untrust zone.
- The IP address of the ge-0/0/0 interface is assigned via DHCP.

*NOTE:* The ge-0/0/1 interface and ge-0/0/2 interface are a part of the default VLAN. The protected hosts can be connected to any one of the ports that are part of the default VLAN.

You can configure the services gateway using the CLI or J-Web. To use J-Web, connect a desktop or laptop computer to the ge-0/0/1 interface. The IP address of the desktop or laptop computer can be statically configured or assigned by the factory default DHCP server enabled on the VLAN interface.

After you connect your desktop or laptop computer to ge-0/0/1, you can use a Web browser to visit the address http://192.168.1.1, access the J-Web setup wizard, and complete the initial setup configuration of the services gateway.

After you perform the initial configuration and commit it by clicking **Commit**, the configured services gateway can no longer act as a DHCP server. Therefore, to continue using the services gateway as a management interface, you should configure the IP address of the interface as part of the initial configuration.
After the initial configuration is complete, you can attach the built-in Ethernet port that you are using for management purposes to the management network.

Related Documentation

- Connecting to the SRX650 Services Gateway Setup Wizard on page 100
- Connecting to the SRX650 Services Gateway from the CLI Locally on page 104
- Connecting to the SRX650 Services Gateway from the CLI Remotely on page 106
- SRX650 Services Gateway Software Configuration Overview on page 97
PART 4

Maintaining and Troubleshooting Components

- Maintaining Components on page 123
- Troubleshooting Components on page 125
CHAPTER 20

Maintaining Components

- Required Tools and Parts for Maintaining the SRX650 Services Gateway Hardware Components on page 123
- Routine Maintenance Procedures for the SRX650 Services Gateway on page 123
- Maintaining the SRX650 Services Gateway Cooling System Components on page 124
- Maintaining the SRX650 Services Gateway Power Supply on page 124

Required Tools and Parts for Maintaining the SRX650 Services Gateway Hardware Components

The following tools and parts are required to maintain the hardware components of the services gateway:

- Electrostatic bag or antistatic mat
- Electrostatic discharge (ESD) grounding wrist strap
- Flat-blade screw-blade screwdriver, approximately 1/8 in. (3 mm)
- Phillips (+) screwdrivers, number 1 and number 2

Routine Maintenance Procedures for the SRX650 Services Gateway

For optimum performance of the services gateway, perform the following preventive maintenance procedures regularly:

- Inspect the installation site for moisture, loose wires or cables, and excessive dust.
- Make sure that airflow is unobstructed around the services gateway and into the air intake vents.
- Check the status LEDs on the front panel of the services gateway, the back panel, and on the Services and Routing Engine (SRE) you are using.

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Maintaining the SRX650 Services Gateway Cooling System Components

The services gateway fan controller works to maintain an optimal temperature for the services gateway. If the fan controller fails, the services gateway temperature will exceed the maximum working temperature and it will fail. Make sure that you maintain the recommended clearances behind the services gateway to enable the fan controller to function optimally.

Maintaining the SRX650 Services Gateway Power Supply

To maintain the power supplies of the services gateway:

- Make sure that all power and grounding cables are arranged so that they do not obstruct access to other services gateway components.
- Routinely check the POWER LED on the front panel. If this LED is solid green, the power supplies are functioning normally.
- Periodically inspect the site to ensure that the grounding and power cables connected to the services gateway are securely in place and that there is no moisture accumulating near the services gateway.

Related Documentation

- Required Tools and Parts for Maintaining the SRX650 Services Gateway Hardware Components on page 123
- Routine Maintenance Procedures for the SRX650 Services Gateway on page 123
- SRX650 Services Gateway Environmental Specifications on page 42
- Maintaining the SRX650 Services Gateway Power Supply on page 124
Troubleshooting with the CLI on the SRX650 Services Gateway

The Junos OS command-line interface (CLI) is the primary tool for controlling and troubleshooting services gateway hardware, the Junos OS, routing protocols, and network connectivity. The CLI commands display information from routing tables, information specific to routing protocols, and information about network connectivity derived from the ping and trace route utilities.

You need to enter the CLI commands on one or more external management devices connected to the services gateway to display the information.

Related Documentation

- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Services and Routing Engine 6 on page 11
- Troubleshooting with Chassis and Interface Alarm Messages on the SRX650 Services Gateway on page 129
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132
- Changing the RESET CONFIG Button Behavior on the SRX650 Services Gateway on page 136
Troubleshooting with LEDs on the SRX650 Services Gateway

The LEDs available on the services gateway display the status of various components. Table 34 on page 126 describes the LEDs on the chassis. To view LED information on the Services and Routing Engine (SRE), see “SRX650 Services Gateway Services and Routing Engine 6” on page 11.

Table 34: Component LEDs on the Services Gateway Chassis

<table>
<thead>
<tr>
<th>LED</th>
<th>Location</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Left side of the front chassis panel</td>
<td>The POWER LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Green and steadily on indicates that all power supply units (PSUs) are functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Red and steadily on indicates failure of one or more PSUs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Amber and steadily on indicates that the Power button has been pressed. The services gateway will shut down gracefully.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off indicates that the device is not receiving power.</td>
</tr>
<tr>
<td>FAN</td>
<td>Left side of the front chassis panel</td>
<td>The FAN LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Green and steadily on indicates fan tray is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Red and steadily on indicates fan tray failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off indicates no fan tray.</td>
</tr>
</tbody>
</table>
### Table 34: Component LEDs on the Services Gateway Chassis (continued)

<table>
<thead>
<tr>
<th>LED</th>
<th>Location</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALARM</td>
<td>Left side of the front chassis panel</td>
<td>The ALARM LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates a hardware component or software module failure, or detection of a firewall attack.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates a major alarm, such as low memory (less than 10% remaining), session full, maximum number of VPN tunnels reached, HA status change, or redundant group member not found.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates that the device is starting up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> When the system is running, if the ALARM LED is off, it indicates that no alarms are present on the device.</td>
</tr>
<tr>
<td>HA SYS</td>
<td>Left side of the front chassis panel</td>
<td>The High Availability (HA SYS) LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates all configured chassis cluster links are available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates cluster member missing or unreachable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates that some configured chassis cluster links are down, but enough links are still active for full chassis cluster functionality. In this situation performance might be reduced, current bandwidth could cause packet drops, or single point of failure might now exist.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates that chassis cluster is not enabled.</td>
</tr>
<tr>
<td>LED</td>
<td>Location</td>
<td>Usage</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SRE 0</td>
<td>Left side of the front chassis panel</td>
<td>The SRE 0 LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates SRE0 is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates SRE0 is initializing, performing diagnostics, or going down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates SRE0 failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates SRE0 slot is empty.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SRE/ACE 1.0</th>
<th>Left side of the front chassis panel</th>
<th>The SRE/ACE 1.0 LED has the following indicator colors:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SRE1 is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACE 1.0 half slot is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACE 1 full slot is functioning normally.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates SRE1/ACE1 (full slot) or ACE 1.0 (half slot) is initializing, performing diagnostics, or going down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and on steadily indicates SRE1/ACE1 (full slot) or ACE 1.0 (half slot) failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates SRE1/ACE1 slot is empty.</td>
</tr>
</tbody>
</table>

**NOTE:** ACE modules are currently not available for ordering, but might be supported in a future release.
Table 34: Component LEDs on the Services Gateway Chassis (continued)

<table>
<thead>
<tr>
<th>LED</th>
<th>Location</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRE/ACE 1.1</td>
<td>Left side of the front chassis panel</td>
<td>The SRE/ACE 1.1 LED has the following indicator colors:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Green and steadily on indicates ACE 1.1 half slot is functioning normally. Not applicable with SRE full slot module.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Amber and steadily on indicates ACE 1.1 half slot is initializing, performing diagnostics, or going down. Not applicable with SRE or ACE full slot modules.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Red and steadily on indicates ACE 1.1 half slot failure. Not applicable with SRE or ACE full slot modules.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off indicates ACE 1.1 half slot is empty.</td>
</tr>
</tbody>
</table>

NOTE: ACE modules are currently not available for ordering, but might be supported in a future release.

Related Documentation
- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Back Panel on page 24
- Troubleshooting with Chassis and Interface Alarm Messages on the SRX650 Services Gateway on page 129
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132
- Using the RESET CONFIG Button on the SRX650 Services Gateway on page 135
- Changing the RESET CONFIG Button Behavior on the SRX650 Services Gateway on page 136

Troubleshooting with Chassis and Interface Alarm Messages on the SRX650 Services Gateway

When the services gateway detects an alarm condition, it lights the red or yellow alarm LED on the front panel as appropriate. To view a more detailed description of the alarm cause, issue the `show chassis alarms` CLI command.

There are two classes of alarm messages:

- Chassis alarms—Indicate a problem with a chassis component such as the cooling system or power supply.
- Interface alarms—Indicate a problem with a specific network interface.
Examples:

user@host# run show chassis alarms

4 alarms currently active

<table>
<thead>
<tr>
<th>Alarm time</th>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-02-05 09:27:11 PDT</td>
<td>Major</td>
<td>ge-0/0/5: Link down</td>
</tr>
<tr>
<td>2009-02-05 09:27:11 PDT</td>
<td>Major</td>
<td>ge-0/0/6: Link down</td>
</tr>
</tbody>
</table>

user@host> show chassis fpc

<table>
<thead>
<tr>
<th>Slot</th>
<th>State</th>
<th>Temp</th>
<th>CPU Utilization (%)</th>
<th>Memory Utilization (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Online</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For more information about the `show chassis alarms` command, see the Monitoring and Troubleshooting for Security Devices.

Table 35 on page 130 describes alarms that can occur for a services gateway chassis component.

**Table 35: Alarms for Services Gateway Chassis Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Alarm Conditions</th>
<th>Action</th>
<th>Alarm Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boot media</td>
<td>The services gateway boots from an alternate boot device.</td>
<td>If the internal flash fails at startup, the services gateway automatically boots itself from the alternative boot device (USB storage device). If you configured your services gateway to boot from an alternative boot device, ignore this alarm condition. If you did not configure the services gateway to boot from an alternative boot device, contact JTAC.</td>
<td>Yellow (minor)</td>
</tr>
</tbody>
</table>

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### Table 35: Alarms for Services Gateway Chassis Components (continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>Alarm Conditions</th>
<th>Action</th>
<th>Alarm Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gigabit-Backplane Physical Interface Module (GPIM)</td>
<td>A GPIM has failed.</td>
<td>Contact JTAC.</td>
<td>Red (major)</td>
</tr>
</tbody>
</table>
| Hardware components on services gateway | The services gateway chassis temperature is too warm. | • Check the room temperature. See “SRX650 Services Gateway Environmental Specifications” on page 42.  
• Check the airflow. See “SRX650 Services Gateway Cabinet Airflow Requirements” on page 52.  
• Check the fans. See “Maintaining the SRX650 Services Gateway Cooling System Components” on page 124.  
If you must replace a fan, contact JTAC. | Yellow (minor) |
| The services gateway fan has failed. | Place your hand near the exhaust vents at the rear of the chassis to determine whether the fan is pushing air out of the chassis. Replace the failed fan and contact JTAC. | Red (major) |

**NOTE:** For more information about alarms, see the Monitoring and Troubleshooting for Security Devices.

### Related Documentation
- Troubleshooting with the CLI on the SRX650 Services Gateway on page 125
- SRX650 Services Gateway Front Panel on page 18
- SRX650 Services Gateway Back Panel on page 24
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132
- Using the RESET CONFIG Button on the SRX650 Services Gateway on page 135
- Changing the RESET CONFIG Button Behavior on the SRX650 Services Gateway on page 136
Troubleshooting the Power System on the SRX650 Services Gateway

The LEDs on the services gateway enable you to determine the performance and operation of the power system. The POWER LED located on the front panel of the services gateway, as described in Table 36 on page 132, indicates the different status settings with respect to the power system. The LEDs on the faceplate of each power supply also show power supply status as described in Table 37 on page 134.

Table 36: POWER LED Description

<table>
<thead>
<tr>
<th>LED Status</th>
<th>LED State</th>
<th>Meaning</th>
<th>Possible Cause and Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>The services gateway is receiving power, and all AC and/or DC power supply units (PSUs) are working properly.</td>
<td>Normal indication. No action is required.</td>
</tr>
<tr>
<td>Red</td>
<td>On</td>
<td>Indicates failure of one or more PSUs.</td>
<td>If you cannot determine the cause of the problem or need additional assistance while troubleshooting a services gateway, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a>, or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).</td>
</tr>
<tr>
<td>Amber</td>
<td>On</td>
<td>Power button has been pressed. The services gateway will shut down.</td>
<td>Once the services gateway is running again, continue troubleshooting.</td>
</tr>
</tbody>
</table>
Table 36: POWER LED Description (continued)

<table>
<thead>
<tr>
<th>LED Status</th>
<th>LED State</th>
<th>Meaning</th>
<th>Possible Cause and Corrective Action</th>
</tr>
</thead>
</table>
| Off        | Indicate | Indicates that the services gateway is not receiving power. | If a red alarm condition occurs, issue the show chassis alarms command to determine the source of the problem.  
- Verify that the AC power cord and/or DC power supply cable is not damaged. If the insulation is cracked or broken, immediately replace the cord or cable.  
- Verify that the source circuit breaker has the proper current rating. Each power supply must be connected to a separate source circuit breaker.  
- Ensure that the power socket you are plugged into is in working condition.  
- Connect the power supply to a different power source with a new power cord or power cables. If the power supply status LEDs indicate that the power supply is not functioning normally, the power supply is the source of the problem. Replace the power supply with a spare.  

**NOTE:** If the system temperature exceeds the threshold, the Junos OS shuts down all power supplies so that no status is displayed.  
The Junos OS also can shut down one of the power supplies for other reasons. In this case, the remaining power supplies provide power to the services gateway, and you can still view the system status through the CLI. |
<table>
<thead>
<tr>
<th>Power Supply Type</th>
<th>LED Label</th>
<th>Color</th>
<th>Meaning</th>
<th>Possible Cause and Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>DC OK</td>
<td>Green</td>
<td>The DC output voltages produced by the power supply are within tolerance.</td>
<td>Normal indication. No action is required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red</td>
<td>One or more of the DC output voltages produced by the power supply are outside of tolerance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unlit</td>
<td>The power supply is not receiving input power.</td>
<td></td>
</tr>
<tr>
<td>AC OK</td>
<td>Green</td>
<td></td>
<td>The AC input power provided to the power supply is within tolerance.</td>
<td>Normal indication. No action is required.</td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td></td>
<td>The AC input power provided to the power supply is outside of tolerance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unlit</td>
<td></td>
<td>The power supply is not receiving input power.</td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>DC OK</td>
<td>Green</td>
<td>The DC output voltages produced by the power supply are within tolerance.</td>
<td>Normal indication. No action is required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red</td>
<td>One or more of the DC output voltages produced by the power supply are outside of tolerance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unlit</td>
<td>The power supply is not receiving input power.</td>
<td></td>
</tr>
<tr>
<td>INPUT OK</td>
<td>Green</td>
<td></td>
<td>The DC input power provided to the power supply is within tolerance.</td>
<td>Normal indication. No action is required.</td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td></td>
<td>The DC input power provided to the power supply is outside of tolerance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unlit</td>
<td></td>
<td>The power supply is not receiving input power.</td>
<td></td>
</tr>
</tbody>
</table>

Related Documentation

- Troubleshooting with the CLI on the SRX650 Services Gateway on page 125
Using the RESET CONFIG Button on the SRX650 Services Gateway

If a configuration fails or denies management access to the services gateway, you can use the RESET CONFIG button to restore the services gateway to the factory default configuration or a rescue configuration. For example, if someone inadvertently commits a configuration that denies management access to a services gateway, you can delete the invalid configuration and replace it with a rescue configuration by pressing the RESET CONFIG button. The button is recessed to prevent it from being pressed accidentally.

The rescue configuration is a previously committed, valid configuration. You must have previously set the rescue configuration through the J-Web interface or the CLI.

To press the RESET CONFIG button, insert a small probe (such as a straightened paper clip) into the pinhole on the front panel.

**CAUTION:**

- By default, pressing and quickly releasing the RESET CONFIG button loads and commits the rescue configuration through the J-Web interface or the CLI. (For details, see the CLI Explorer.)
- By default, pressing and holding the RESET CONFIG button for 15 seconds or more—until the STATUS LED blinks red—deletes all configurations on the services gateway, including the backup configurations and rescue configuration, and loads and commits the factory configuration.

For details about factory-default settings, see “Viewing Factory-Default Settings of the SRX650 Services Gateway” on page 106.

For details about performing initial software configuration, see “Configuring Basic Settings for the SRX650 Services Gateway with the CLI or the J-Web Interface” on page 113.

### Related Documentation

- Changing the RESET CONFIG Button Behavior on the SRX650 Services Gateway on page 136
- Troubleshooting with LEDs on the SRX650 Services Gateway on page 126
- Troubleshooting with Chassis and Interface Alarm Messages on the SRX650 Services Gateway on page 129
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132
- Resetting the SRX650 Services Gateway on page 136
Changing the RESET CONFIG Button Behavior on the SRX650 Services Gateway

You can change the default operation of the RESET CONFIG button of the SRX Services Gateway by limiting how the button resets the services gateway:

- To prevent the RESET CONFIG button from setting the services gateway to the factory default configuration and deleting all other configurations, enter the following command. You can still press and quickly release the button to reset it to the rescue configuration.

  \[ \text{user@host} \# \text{set chassis config-button no-clear} \]

- To prevent the RESET CONFIG button from setting the services gateway to the rescue configuration, enter the following command. You can still press and hold the button for 15 seconds or more to reset the services gateway to the factory defaults.

  \[ \text{user@host} \# \text{set chassis config-button no-rescue} \]

- To disable the button and prevent the services gateway from resetting to either configuration, enter the following command:

  \[ \text{user@host} \# \text{set chassis config-button no-clear no-rescue} \]

The `no-rescue` option prevents the RESET CONFIG button from loading the rescue configuration. The `no-clear` option prevents the RESET CONFIG button from deleting all configurations on the services gateway.

To return the function of the RESET CONFIG button to its default behavior, remove the `config-button` statement from the services gateway configuration.

Related Documentation

- Resetting the SRX650 Services Gateway on page 136
- Troubleshooting with the CLI on the SRX650 Services Gateway on page 125
- Using the RESET CONFIG Button on the SRX650 Services Gateway on page 135
- SRX650 Services Gateway Front Panel on page 18
- Troubleshooting the Power System on the SRX650 Services Gateway on page 132

Resetting the SRX650 Services Gateway

Use the RESET CONFIG button to return the services gateway to either the rescue configuration or the factory default configuration. The button is recessed to prevent it from being pressed accidentally. To press this button, insert a small probe (such as a straightened paperclip) into the pinhole on the SRE on the back panel of the chassis (see “SRX650 Services Gateway Services and Routing Engine 6” on page 11).

For example, if someone inadvertently commits a configuration that denies management access to a services gateway, you can delete the invalid configuration and replace it with a rescue configuration by pressing the RESET CONFIG button. You must have previously
set the rescue configuration through J-Web or the CLI. The rescue configuration is a previously committed, valid configuration.

CAUTION: Pressing and holding the RESET CONFIG button for 15 seconds or more—until the STATUS LED blinks red—deletes all configurations on the services gateway, including the backup configurations and rescue configuration, and loads and commits the factory configuration.

There are two types of reset:

- Power On—This reset occurs during the services gateway powering on and powering off. This reset is issued when the services gateway is first powered on. The system accesses the configuration settings from the boot flash for this type of reset.
- Config—This reset is the asynchronous reset input to the services gateway. The RESET CONFIG button is used to generate a reset to load the default configuration settings from the kernel. The system accesses the default factory settings from the internal flash for this type of reset.

Related Documentation
- Grounding the SRX650 Services Gateway on page 82
- Powering On the SRX650 Services Gateway on page 94
- Powering Off the SRX650 Services Gateway on page 95
- SRX650 Services Gateway Front Panel on page 18
PART 5

Replacing Components

- Overview of Replacing Components on page 141
- Replacing the Services and Routing Engine (SRE) Module on page 143
- Replacing Power System Components on page 145
- Replacing Cooling System Components on page 151
- Contacting Customer Support and Returning Components on page 155
CHAPTER 22

Overview of Replacing Components

- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141

Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway

To replace hardware components, you need the tools and parts listed in Table 38 on page 141.

Table 38: Tools and Parts Required for Replacing Services Gateway Hardware Components

<table>
<thead>
<tr>
<th>Tool or Part</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 in. nut driver or pliers</td>
<td>Cables and connectors</td>
</tr>
<tr>
<td>Blank panels (if component is not reinstalled)</td>
<td>Power supply &lt;br&gt; SRE and multi-use processor &lt;br&gt; GPIMs</td>
</tr>
<tr>
<td>Electrostatic bag or anti-static mat</td>
<td>SRE &lt;br&gt; GPIMs</td>
</tr>
<tr>
<td>Electrostatic discharge (ESD) grounding wrist strap</td>
<td>All</td>
</tr>
<tr>
<td>Flat-blade (−) screwdriver</td>
<td>Cables and connectors</td>
</tr>
<tr>
<td>Phillips (+) screwdrivers, numbers 1 and 2</td>
<td>Air filter &lt;br&gt; Cables and connectors &lt;br&gt; Blank panels &lt;br&gt; Fan tray &lt;br&gt; GPIMs &lt;br&gt; SRE</td>
</tr>
<tr>
<td>Wire cutters</td>
<td>Cables and connectors</td>
</tr>
</tbody>
</table>

Related Documentation
- Removing the Fan Tray on the SRX650 Services Gateway on page 151
• Removing the SRE from the SRX650 Services Gateway on page 143
• Removing the Air Filter on the SRX650 Services Gateway on page 152
• Removing an AC Power Supply from the SRX650 Services Gateway on page 145
• Removing a DC Power Supply on the SRX650 Services Gateway on page 147
Replacing the Services and Routing Engine (SRE) Module

- Removing the SRE from the SRX650 Services Gateway on page 143

Removing the SRE from the SRX650 Services Gateway

The SRE is located at the back panel of the chassis and can be installed in the horizontal slots labeled SRE0 or SRE1/0/1.1. The SRE weighs 3 lb, 13.6 oz (1.75 kg).

CAUTION: The SRE is not hot-swappable. You must power off the services gateway before removing or inserting an SRE.

To remove the SRE:

1. Obtain an electrostatic bag to store the SRE after you remove it.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

3. Power off the services gateway.

4. Use a number 2 Phillips screwdriver to loosen the captive screws on each side of the SRE.

5. Grasp the locking levers on each side of the SRE and pull toward you to unlock the SRE (see Figure 23 on page 144).

6. Slide the SRE out and place it in the electrostatic bag.

7. If you are not replacing the SRE, install a blank panel over the empty slot.
Figure 23: Removing the Services and Routing Engine (SRE)

Related Documentation
- SRX650 Services Gateway Back Panel on page 24
- Installing the SRE on the SRX650 Services Gateway on page 75
- SRX650 Services Gateway Services and Routing Engine 6 on page 11
- Powering Off the SRX650 Services Gateway on page 95
CHAPTER 24

Replacing Power System Components

- Removing an AC Power Supply from the SRX650 Services Gateway on page 145
- Disconnecting an AC Power Cord from the SRX650 Services Gateway on page 146
- Removing a DC Power Supply on the SRX650 Services Gateway on page 147
- Removing a DC Power Supply Cable from the SRX650 Services Gateway on page 148

Removing an AC Power Supply from the SRX650 Services Gateway

Up to two power supplies can be located at the rear of the chassis on the right side. Each AC power supply weighs 2 lb, 14.6 oz (1.32 kg).

CAUTION: Do not leave a power supply slot empty for more than 30 minutes while the services gateway is operational. For proper airflow, the power supply must remain in the chassis, or a blank panel must be used in an empty slot.

NOTE: After powering off a power supply, wait at least 60 seconds before turning it back on.

To remove an AC power supply:

1. Switch off the dedicated facility circuit breaker for the power supply, and remove the power cord from the AC power source. Follow the electrostatic discharge (ESD) and disconnection instructions for your site.

2. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

3. Press the latch to the left of the power outlet (see Figure 24 on page 146).

4. After the power supply is unlatched, remove the power cord from the power supply.

5. Pull the power supply straight out of the chassis.
Figure 24: Removing an AC Power Supply from the SRX650 Services Gateway

WARNING: Before working on an AC-powered device or near power supplies, unplug the power cord.

To disconnect the AC power cord:

1. Unplug the power cord from the power source receptacle.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

3. Unplug the power cord from the appliance inlet on the power supply.

Related Documentation

- Installing an AC Power Supply on the SRX650 Services Gateway on page 77
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
- Disconnecting an AC Power Cord from the SRX650 Services Gateway on page 146
- Connecting an AC Power Cord to the SRX650 Services Gateway on page 92
- Removing an AC Power Supply from the SRX650 Services Gateway on page 145
- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
Removing a DC Power Supply on the SRX650 Services Gateway

Up to two power supplies can be located at the rear of the chassis on the right side. Each DC power supply weighs approximately 2 lbs, 13.4 oz (1.29 kg).

**CAUTION:** Do not leave a power supply slot empty for more than 30 minutes while the services gateway is operational. For proper airflow, the power supply must remain in the chassis, or a blank panel must be used in an empty slot.

**NOTE:** After powering off a power supply, wait at least 60 seconds before turning it back on.

To remove a DC power supply, see Figure 25 on page 148.

1. Switch off the dedicated facility circuit breaker for the power supply. Follow the electrostatic discharge (ESD) and disconnection instructions for your site.

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 grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

4. Remove the clear plastic cover protecting the terminal studs on the faceplate.

5. Remove the screws and washers from the terminals. Use a number 2 Phillips screwdriver to loosen and remove the screws.

6. Remove the cable lugs from the terminal studs.

7. Carefully move the power cables out of the way.

8. Push the tab on the left edge of the power supply to the right.

9. Pull the power supply straight out of the chassis.
Removing a DC Power Supply from the SRX650 Services Gateway

To remove a power supply cable connected to a DC power supply:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to an approved site ESD grounding point. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Switch off the external circuit breakers for all the cables attached to the power supply. 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. Remove the power cable from the DC power source.

4. Attach an ESD grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

5. Make sure the cable is not touching or in the way of any services gateway components and that it does not drape where people could trip on it.
6. Remove the clear plastic cover protecting the terminal studs on the faceplate.

7. Attach the power cable to the DC power source.

8. Verify that the DC source power cabling is correct. If the power cable is correctly installed and the power supply is functioning normally, the POWER LED on the front panel lights green steadily.

Related Documentation

- Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
- Removing a DC Power Supply on the SRX650 Services Gateway on page 147
- Installing a DC Power Supply on the SRX650 Services Gateway on page 78
CHAPTER 25
Replacing Cooling System Components

• Removing the Fan Tray on the SRX650 Services Gateway on page 151
• Removing the Air Filter on the SRX650 Services Gateway on page 152

Removing the Fan Tray on the SRX650 Services Gateway

A single handle with two screws holds both the fan tray and air filter on the back of the services gateway. To remove the fan tray, you must also remove the air filter. See Figure 26 on page 152.

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the side of the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Use a number 2 Phillips screwdriver to loosen and remove only the center screw of the handle.

3. Grasp the fan tray handle and pull it out approximately 1 to 3 inches.

   WARNING: To avoid injury, keep tools and your fingers away from the fans as you slide the fan tray out of the chassis. The fans might still be spinning.

4. Press the latch located on the inside of the fan tray to release it from the chassis.

5. Place one hand under the fan tray to support it and carefully slide the fan tray (and air filter) completely out of the chassis.
Removing the Air Filter on the SRX650 Services Gateway

NOTE: The SRX650 Services Gateway does not ship with an air filter. An air filter must be purchased separately.

CAUTION: Except during replacement, always keep the air filter in place while the services gateway is operating. Because the fans are very powerful, they could pull small bits of wire or other materials into the device through the unfiltered air intake. This could damage the components.
A single handle with two screws holds both the fan tray and air filter on the back of the services gateway.

NOTE: You can replace the air filter while the services gateway is running.

To remove just the air filter:

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

2. Use a number 1 Phillips screwdriver to loosen both captive screws on the handle (see Figure 27 on page 153).

   Figure 27: Loosening Captive Screws

3. Carefully slide out the fan tray.

4. Remove just the air filter.
Figure 28: Removing the Air Filter

Related Documentation

• Installing the Air Filter on the SRX650 Services Gateway on page 74
• Required Tools and Parts for Replacing Hardware Components on the SRX650 Services Gateway on page 141
Contacting Customer Support

Once you have located the serial numbers of the device or component, you can return the device or component for repair or replacement. For this, you need to contact Juniper Networks Technical Assistance Center (JTAC).

You can contact JTAC 24 hours a day, 7 days a week, using any of the following methods:

- On the Web: Using the Case Manager link at https://www.juniper.net/support/
- By telephone:
  - From the US and Canada: 1-888-314-JTAC
  - From all other locations: 1-408-745-9500

NOTE: If contacting JTAC by telephone, enter your 11-digit case number followed by the pound (#) key if this is an existing case, or press the star (*) key to be routed to the next available support engineer.
Return Procedure for the SRX650 Services Gateway

To return an SRX650 Services Gateway or component to Juniper Networks for repair or replacement:

1. Determine the part number and serial number of the services gateway or component.

2. Obtain a Return Materials Authorization (RMA) number from JTAC.

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

3. Pack the SRX650 Services Gateway or component for shipping.

For more information about return and repair policies, see the customer support webpage at [https://www.juniper.net/support/guidelines.html](https://www.juniper.net/support/guidelines.html).

For product problems or technical support issues, open a support case using the Case Manager link at [https://www.juniper.net/support/](https://www.juniper.net/support/) or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).
Locating the SRX650 Services Gateway Chassis Serial Number and Agency Labels

The SRX650 Services Gateway serial number is located on the bottom of the device on the compliance/agency label.

Related Documentation
- Return Procedure for the SRX650 Services Gateway on page 156
- Listing the SRX650 Services Gateway Component Details with the CLI on page 157
- Contacting Customer Support on page 155
- Information You Might Need to Supply to JTAC on page 158

Locating the SRX650 Services Gateway GPIM Serial Number Label

Gigabit-Backplane Physical Interface Modules (GPIMs) are field-replaceable on the SRX650 Services Gateway. Each GPIM has a unique serial number. The exact location might be slightly different on different GPIMs (XPIMs or GPIMs), depending on the placement of the components on the GPIM.

Related Documentation
- Return Procedure for the SRX650 Services Gateway on page 156
- Listing the SRX650 Services Gateway Component Details with the CLI on page 157
- Contacting Customer Support on page 155
- Information You Might Need to Supply to JTAC on page 158

Listing the SRX650 Services Gateway Component Details with the CLI

Before contacting Juniper Networks to request a Return Materials Authorization (RMA), you must find the serial number on the SRX650 Services Gateway or component.

To list all of the SRX650 Services Gateway components and their serial numbers, enter the following command-line interface (CLI) command:

```
user@host> show chassis hardware
Hardware inventory:
Item Version Part number Serial number Description
Chassis AJ2608AE0013 SRX650
Midplane REV 02 710-023875 AJ2608AE0013
System IO REV 01 710-023209 SRXSME System IO
Routing Engine RE-SRXSME-SRE3
FPC 0 FPC
PIC 0 4x GE Base PIC
```
NOTE: In the show chassis hardware command, the Gigabit-Backplane Physical Interface Module (GPIM) slot number is reported as an FPC number, and the GPIM number (always 0) is reported as the PIC number.

Most components also have a serial number ID label attached to the component body.
• Electrostatic discharge (ESD) grounding wrist strap
• Flat-blade screwdriver, approximately 1/4 in. (6 mm)
• Phillips (+) screwdrivers, numbers 1 and 2

Related Documentation
• Return Procedure for the SRX650 Services Gateway on page 156
• Packing the SRX650 Services Gateway for Shipment on page 159
• Packing the SRX650 Services Gateway Components for Shipment on page 160

Packing the SRX650 Services Gateway for Shipment

To pack the SRX650 Services Gateway for shipment:

1. Retrieve the shipping carton and packing materials in which the services gateway was originally shipped. If you do not have these materials, contact your Juniper Networks representative about approved packaging materials.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to the ESD point on the chassis or to an outside ESD point if the device is disconnected from earth ground. For more information about ESD, see “Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway” on page 168.

3. On the console or other management device connected to the services gateway, enter the CLI operational mode and issue the following command to shut down the services gateway software:
   
   user@host> request system halt

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

4. Shut down power to the services gateway by pressing the Power button on the front of the services gateway.

5. Disconnect power from the services gateway.

6. Remove the cables that connect to all external devices.

7. Remove the SRE (and GPIMs, if any have been installed) from the services gateway.

8. If the services gateway is installed in a rack, have one person support the weight of the services gateway while another person unscrews and removes the mounting screws.

9. Place the services gateway in the shipping carton.
10. Cover the services gateway with an ESD bag, and place the packing foam on top of and around the device.

11. Replace the accessory box on top of the packing foam.

12. Securely tape the box closed.

13. Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

---

**Packing the SRX650 Services Gateway Components for Shipment**

Follow these guidelines for packing and shipping individual components of the services gateway:

- When you return a component, make sure that it is adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Use the original shipping materials if they are available.
- Place the individual component in an electrostatic bag.
- Write the Return Materials Authorization (RMA) number on the exterior of the box to ensure proper tracking.

---

**CAUTION:** Do not stack any of the services gateway components during packing.

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**Related Documentation**

- Return Procedure for the SRX650 Services Gateway on page 156
- Packing the SRX650 Services Gateway for Shipment on page 159
- Required Tools and Parts for Packing the SRX650 Services Gateway on page 158
PART 6

Safety

- General Safety Guidelines and Warnings on page 163
- Fire Safety Requirements on page 171
- Laser and LED Safety Guidelines and Warnings on page 173
- Maintenance and Operational Safety Guidelines and Warnings on page 179
- Electrical Safety Guidelines and Warnings on page 187
- Agency Approvals and Regulatory Compliance Information on page 197
CHAPTER 27

General Safety Guidelines and Warnings

- SRX650 Services Gateway Definition of Safety Warning Levels on page 163
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- SRX650 Services Gateway Safety Requirements, Warnings, and Guidelines on page 166
- Restricted Access Area Warning on page 166
- Qualified Personnel Warning on page 167
- Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway on page 168

**SRX650 Services Gateway Definition of Safety Warning Levels**

This guide uses the following four levels of safety warnings:

- **NOTE:** You might find this information helpful in a particular situation or might otherwise overlook it.

- **CAUTION:** You need to observe the specified guidelines to avoid minor injury or discomfort to you or severe damage to the device.

- **WARNING:** This symbol is used with laser warnings. Unterminated optical connectors can emit invisible laser radiation. Focusing your eye directly on a laser source—even a low-power laser—could permanently damage the eye.

- **WARNING:** This symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

**Waarschuwing** Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige
apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico’s en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johta ruumiinvamman. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuksien ehkäisykeinoista.

Attention Ce symbole d’avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.


Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer prácticas comuns que possam prevenir possíveis acidentes.

¡Atención! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.


Related Documentation

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
The following guidelines help ensure your safety and protect the services gateway from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in this guide. Make sure that only authorized service personnel perform other system services.
- Keep the area around the chassis clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip on them.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Do not open or remove chassis covers or sheet metal parts unless instructions are provided in this guide. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the services gateway chassis or onto any services gateway component. Such an action could cause electrical shock or damage the services gateway.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.

Related Documentation

- SRX650 Services Gateway Definition of Safety Warning Levels on page 163
- Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway on page 168
- SRX650 Services Gateway Fire Safety Requirements and Fire Suppression Equipment on page 171
SRX650 Services Gateway Safety Requirements, Warnings, and Guidelines

To avoid harm to yourself or the services gateway as you install and maintain it, follow the guidelines for working with and near electrical equipment, as well as the safety procedures for working with services gateways.

NOTE: Providing an exhaustive set of guidelines for working with electrical equipment is beyond the scope of this guide.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- SRX650 Services Gateway Electrical Wiring Guidelines on page 53
- Required Tools and Parts for Installing the SRX650 Services Gateway on page 63
- Preparing the SRX650 Services Gateway for Rack-Mount Installation on page 69
- General Site Installation Guidelines for the SRX650 Services Gateway on page 41

Restricted Access Area Warning

WARNING: The services gateway is intended for installation in restricted access areas. A restricted access area is an area to which access can be gained only by service personnel through the use of a special tool, lock and key, or other means of security, and which is controlled by the authority responsible for the location.

Waarschuwing Dit toestel is bedoeld voor installatie op plaatsen met beperkte toegang. Een plaats met beperkte toegang is een plaats waar toegang slechts door servicepersoneel verkregen kan worden door middel van een speciaal instrument, een slot en sleutel, of een ander veiligheidsmiddel, en welke beheerd wordt door de overheidsinstantie die verantwoordelijk is voor de locatie.

Varoitus Tämä laite on tarkoitettu asennettavaksi paikkaan, johon pääsy on rajoitettua. Paikka, johon pääsy on rajoitettua, tarkoitetaan paikkana, johon vain huoltohenkilöstö pääsee jonkin erikoistyökalun, lukkoon sopivan avaimen tai jonkin muun turvalaitteen avulla ja joka on paikasta vastuussa olevien toimivaltaisten henkilöiden valvoma.

Attention Cet appareil est à installer dans des zones d'accès réserver. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. L'accès aux zones de sécurité est sous le contrôle de l'autorité responsable de l'emplacement.
**WARNING:** Only trained and qualified personnel should install or replace the services gateway.

**Waarschuwing** Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

### Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Qualified Personnel Warning on page 167

### Qualified Personnel Warning
Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway

Many services gateway hardware components are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

- Always use an ESD wrist strap or ankle strap, and verify that it is in direct contact with your skin.

**CAUTION:** For safety, periodically check the resistance value of the ESD strap. The resistance must be in the range of 1 to 10 Mohm.

- When handling any component that is removed from the chassis, verify that the equipment end of your ESD strap is attached to one of the ESD points on the chassis.
- Avoid contact between the component and your clothing. ESD voltages emitted from clothing can damage components.

- When removing or installing a component, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an electrostatic bag. See Figure 29 on page 169. If you are returning a component, place it into an electrostatic bag before packing it.

**Figure 29: Placing a Component into an Electrostatic Bag**

- **Related Documentation**
  - SRX650 Services Gateway Definition of Safety Warning Levels on page 163
  - SRX650 Services Gateway Fire Safety Requirements and Fire Suppression Equipment on page 171
  - SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
CHAPTER 28

Fire Safety Requirements

- SRX650 Services Gateway Fire Safety Requirements and Fire Suppression Equipment on page 171

SRX650 Services Gateway Fire Safety Requirements and Fire Suppression Equipment

In the event of a fire emergency involving devices and other network equipment, the safety of people is the primary concern. Establish procedures for protecting people in the event of a fire emergency, provide safety training, and properly provision fire control equipment and fire extinguishers.

In addition, establish procedures to protect your equipment in the event of a fire emergency. Juniper Networks products should be installed in an environment suitable for electronic equipment. We recommend that fire suppression equipment be available in the event of a fire in the vicinity of the equipment and that all local fire, safety, and electrical codes and ordinances be observed when installing and operating your equipment.

In the event of an electrical hazard or an electrical fire, first turn power off to the equipment at the source. Then use a Type C fire extinguisher to extinguish the fire. Type C fire extinguishers, which use noncorrosive fire retardants such as carbon dioxide (CO$_2$) and Halotron, are most effective for suppressing electrical fires. Type C fire extinguishers displace the oxygen from the point of combustion to eliminate the fire. For extinguishing fire on or around equipment that draws air from the environment for cooling, use this type of inert oxygen displacement extinguisher instead of an extinguisher that leave residues on equipment.

Do not use multipurpose Type ABC chemical fire extinguishers (dry chemical fire extinguishers) near Juniper Networks equipment. The primary ingredient in these fire extinguishers is monoammonium phosphate, which is very sticky and difficult to clean. In addition, in minute amounts of moisture, monoammonium phosphate can become highly corrosive and corrodes most metals.

Any equipment in a room in which a chemical fire extinguisher has been discharged is subject to premature failure and unreliable operation. The equipment is considered to be irreparably damaged.
NOTE: To keep warranties effective, do not use a dry chemical fire extinguisher to control a fire at or near a Juniper Networks services gateway. If a dry chemical fire extinguisher is used, the unit is no longer eligible for coverage under a service agreement.

We recommend that you dispose of any irreparably damaged equipment in an environmentally responsible manner.

Related Documentation

- SRX650 Services Gateway Definition of Safety Warning Levels on page 163
- Preventing Electrostatic Discharge Damage to the SRX650 Services Gateway on page 168
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
CHAPTER 29

Laser and LED Safety Guidelines and Warnings

- General Laser Safety Guidelines on page 173
- Class 1 Laser Warning on page 174
- Class 1 LED Product Warning on page 174
- Laser Beam Warning on page 175
- Radiation from Open Port Apertures Warning on page 176

General Laser Safety Guidelines

When working around the services gateway, observe the following safety guidelines to prevent eye injury:

- Do not look into unterminated ports or at fibers that connect to unknown sources.
- Do not examine unterminated optical ports with optical instruments.
- Avoid direct exposure to the beam.

WARNING: Unterminated optical connectors can emit invisible laser radiation. The lens in the human eye focuses all the laser power on the retina, so focusing the eye directly on a laser source—even a low-power laser—could permanently damage the eye.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Class 1 Laser Warning on page 174
- Class 1 LED Product Warning on page 174
- Laser Beam Warning on page 175
- Radiation from Open Port Apertures Warning on page 176
Class 1 Laser Warning

WARNING: Class 1 laser product.
Waarschuwing Klasse-1 laser produkt.
Varoitus Luokan 1 lasertuote.
Attention Produit laser de classe I.
Warnung Laserprodukt der Klasse 1.
Avvertenza Prodotto laser di Classe 1.
Advarsel Laserprodukt av klasse 1.
Aviso Produto laser de classe 1.
iAtención! Producto láser Clase I.
Warning! Laserprodukt av klass 1.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- General Laser Safety Guidelines on page 173
- Class 1 LED Product Warning on page 174
- Laser Beam Warning on page 175
- Radiation from Open Port Apertures Warning on page 176

Class 1 LED Product Warning

WARNING: Class 1 LED product.
Waarschuwing Klasse 1 LED-product.
Varoitus Luokan 1 valodiodituote.
Attention Alarme de produit LED Class I.
Warnung Class 1 LED-Produktwarnung.
Avvertenza Avvertenza prodotto LED di Classe 1.
Advarsel LED-produkt i klasse 1.
Aviso Produto de classe 1 com LED.
Laser Beam Warning

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

Waarschuwing Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

Varoitus Älä katsa säteeseen äläkää tarkastele sitä suoraan optisen laitteen avulla.

Attention Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

Warnung Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

Avvertenza Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

Advarsel Stir eller se ikke direkte p strlen med optiske instrumenter.

Aviso Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

¡Atención! No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

Warning! Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.
Radiation from Open Port Apertures Warning

**WARNING:** Because invisible radiation can be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.

**Waarschuwing** Aangezien onzichtbare straling vanuit de opening van de poort kan komen als er geen fiberkabel aangesloten is, dient blootstelling aan straling en het kijken in open openingen vermeden te worden.

**Varoitus** Koska portin aukosta voi emiittua näkymätöntä säteilyä, kun kuitukaapelia ei ole kytkettynä, vältä säteilylle altistumista äläkä katso avoimiin aukoihin.

**Attention** Des radiations invisibles à l’il nu pouvant traverser l’ouverture du port lorsqu’aucun câble en fibre optique n’y est connecté, il est recommandé de ne pas regarder fixement l’intérieur de ces ouvertures.

**Warnung** Aus der Port-Öffnung können unsichtbare Strahlen emittieren, wenn kein Glasfaserkabel angeschlossen ist. Vermeiden Sie es, sich den Strahlungen auszusetzen, und starren Sie nicht in die Öffnungen!

**Avvertenza** Quando i cavi in fibra sono inseriti, radiazioni invisibili possono essere emesse attraverso l’apertura della porta. Evitate di esporvi alle radiazioni e non guardate direttamente nelle aperture.

**Advarsel** Unngå utsettelse for stråling, og stir ikke inn i åpninger som er åpne, fordi usynlig stråling kan emitteres fra portens åpning når det ikke er tilkoblet en fiberkabel.

**Aviso** Dada a possibilidade de emissão de radiação invisível através do orifício da via de acesso, quando esta não tiver nenhum cabo de fibra conectado, deverá evitar a exposição à radiação e não deverá olhar fixamente para orifícios que se encontrarem a descoberto.

**¡Atención!** Debido a que la apertura del puerto puede emitir radiación invisible cuando no existe un cable de fibra conectado, evite mirar directamente a las aperturas para no exponerse a la radiación.

**Warning!** Osynlig strålning kan avges från en portöppning utan ansluten fiberkabel och du bör därför undvika att bli utsatt för strålning genom att inte stirra in i oskyddade öppningar.

**Related Documentation**

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- General Laser Safety Guidelines on page 173
- Class 1 Laser Warning on page 174
- Class 1 LED Product Warning on page 174
- Laser Beam Warning on page 175
Battery-Handling Warning

**WARNING:** Replacing the battery incorrectly might result in an explosion. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

**Waarschuwing** Er is ontploffingsgevaar als de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type dat door de fabrikant aanbevolen is. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften weggeworpen te worden.


**Attention** Danger d’explosion si la pile n’est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

**Warnung** Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.
Avvertenza Pericolo di esplosione se la batteria non è installata correttamente. Sostituire solo con una di tipo uguale o equivalente, consigliata dal produttore. Eliminare le batterie usate secondo le istruzioni del produttore.


Aviso Existe perigo de explosão se a bateria for substituída incorrectamente. Substitua a bateria por uma bateria igual ou de um tipo equivalente recomendado pelo fabricante. Destrua as baterias usadas conforme as instruções do fabricante.

¡Atención! Existe peligro de explosión si la bateria se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

Warning! Explosionsfara vid felaktigt batteribyte. Ersätt endast batteriet med samma batterityp som rekommenderas av tillverkaren eller motsvarande. Följ tillverkarens anvisningar vid kassering av använda batterier.

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Related Documentation

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Jewelry Removal Warning on page 181
- Lightning Activity Warning on page 180
- Operating Temperature Warning on page 183
- Product Disposal Warning on page 184

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Lightning Activity Warning

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

Waarschuwing Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.

Varoitus Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.

Attention Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.

Warnung Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.
Jewelry Removal Warning

WARNING: Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Waarschuwing Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

Varoitus Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitännänapoihin.

Attention Avant d’accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu’ils sont branchés à l’alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l’objet métallique aux bornes.
Warnung Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzten sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.

Avvertenza Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.

Advarsel Fjern alle smykker (inkluder ring, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.

Aviso Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.

¡Atención! Antes de operar sobre equipos conectados a líneas de alimentación, quítarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.

Warning! Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontaktorna.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Battery-Handling Warning on page 179
- Lightning Activity Warning on page 180
- Operating Temperature Warning on page 183
- Product Disposal Warning on page 184
WARNING: To prevent the services gateway from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104°F (40°C). To prevent airflow restriction, allow at least 6 in. (15.2 cm) of clearance around the ventilation openings.

Waarschuwing Om te voorkomen dat welke services gateway van de Juniper Networks services gateway dan ook oververhit raakt, dient u deze niet te bedienen op een plaats waar de maximale aanbevolen omgevingstemperatuur van 40°C wordt overschreden. Om te voorkomen dat de luchtstroom wordt beperkt, dient er minstens 15,2 cm speling rond de ventilatie-openingen te zijn.

Varoitus Ettei Juniper Networks services gateway-sarjan reititin ylikuumentuisi, sitä ei saa käytettää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 40°C. Ettei ilmanvaihtoestyisi, tuuletusaukojen ympärille on jättettävä ainakin 15,2 cm tilaa.

Attention Pour éviter toute surchauffe des routeurs de la gamme Juniper Networks services gateway, ne l’utilisez pas dans une zone où la température ambiante est supérieure à 40°C. Pour permettre un flux d’air constant, dégagez un espace d’au moins 15,2 cm autour des ouvertures de ventilations.

Warnung Um einen services gateway der services gateway vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene Maximum von 40°C überschreitet. Um Lüftungsverschluß zu verhindern, achten Sie darauf, daß mindestens 15,2 cm lichter Raum um die Lüftungsoffnungen herum frei bleibt.

Avvertenza Per evitare il surriscaldamento dei services gateway, non adoperateli in un locale che ecceda la temperatura ambientale massima di 40°C. Per evitare che la circolazione dell’aria sia impedita, lasciate uno spazio di almeno 15,2 cm di fronte alle aperture delle ventole.

Advarsel Unngå overoppheting av eventuelle rutere i Juniper Networks services gateway Disse skal ikke brukes på steder der den anbefalte maksimale omgivelsesstemperaturen overstiger 40°C. Sørg for at klaringen rundt luftåpningene er minst 15,2 cm for å forhindre nedsatt luftsirkulasjon.

Aviso Para evitar o sobreaquecimento do encaminhador Juniper Networks services gateway, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 40°C. Para evitar a restrição à circulação de ar, deixe pelo menos um espaço de 15,2 cm à volta das aberturas de ventilação.

¡Atención! Para impedir que un encaminador de la serie Juniper Networks services gateway se recaliente, no lo haga funcionar en un área en la que se
supere la temperatura ambiente máxima recomendada de 40°C. Para impedir la restricción de la entrada de aire, deje un espacio mínimo de 15,2 cm alrededor de las aperturas para ventilación.

**Warning!** Förhindra att en Juniper Networks services gateway överhettas genom att inte använda den i ett område där den maximalt rekommenderade omgivningstemperaturen på 40°C överskrider. Förhindra att luftcirkulationen inskränks genom att se till att det finns fritt utrymme på minst 15,2 cm omkring ventilationsöppningarna.

**Related Documentation**
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Battery-Handling Warning on page 179
- Lightning Activity Warning on page 180
- Jewelry Removal Warning on page 181
- Product Disposal Warning on page 184

**Product Disposal Warning**

**WARNING:** Disposal of this product must be handled according to all national laws and regulations.

**Waarschuwing** Dit produkt dient volgens alle landelijke wetten en voorschriften te worden afgedankt.

**Varoitus** Tämän tuotteen lopullisesta hävittämisestä tulee huolehtia kaikkia valtakunnallisia lakeja ja säännöksiä noudattaen.

**Attention** La mise au rebut définitive de ce produit doit être effectuée conformément à toutes les lois et réglementations en vigueur.

**Warnung** Dieses Produkt muß den geltenden Gesetzen und Vorschriften entsprechend entsorgt werden.

**Avvertenza** L’eliminazione finale di questo prodotto deve essere eseguita osservando le normative italiane vigenti in materia.

**Advarsel** Endelig disponering av dette produktet må skje i henhold til nasjonale lover og forskrifter.

**Aviso** A descartagem final deste produto deverá ser efectuada de acordo com os regulamentos e a legislação nacional.

¡Atención! El desecho final de este producto debe realizarse según todas las leyes y regulaciones nacionales.
Warning! Slutlig kassering av denna produkt bör skötas i enlighet med landets alla lagar och föreskrifter.

### Lithium Battery

Batteries in this product are not based on mercury, lead, or cadmium substances. The batteries used in this product are in compliance with EU Directives 91/157/EEC, 93/86/EEC, and 98/101/EEC. The product documentation includes instructional information about the proper method of reclamation and recycling.

**Related Documentation**
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Battery-Handling Warning on page 179
- Lightning Activity Warning on page 180
- Jewelry Removal Warning on page 181
- Operating Temperature Warning on page 183
CHAPTER 31

Electrical Safety Guidelines and Warnings

- In Case of Electrical Accident on page 187
- General Electrical Safety Guidelines and Warnings on page 187
- AC Power Electrical Safety Guidelines on page 188
- DC Power Electrical Safety Guidelines on page 189

In Case of Electrical Accident

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.

2. Disconnect power from the services gateway.

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

Related Documentation

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- General Electrical Safety Guidelines and Warnings on page 187
- AC Power Electrical Safety Guidelines on page 188
- SRX650 Services Gateway Power Requirements on page 58
- Grounding the SRX650 Services Gateway on page 82

General Electrical Safety Guidelines and Warnings

- Install the services gateway in compliance with the following local, national, or international electrical codes:
  - United States—National Fire Protection Association (NFPA 70), United States National Electrical Code
  - Canada—Canadian Electrical Code, Part 1, CSA C22.1
• Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7

• Evaluated to the TN power system

• Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.

• Do not work alone if potentially hazardous conditions exist anywhere in your workspace.

• Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.

• Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.

• Operate the services gateway within marked electrical ratings and product usage instructions.

• For the services gateway and peripheral equipment to function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.

Related Documentation

• SRX650 Services Gateway General Safety Guidelines and Warnings on page 165

• In Case of Electrical Accident on page 187

• AC Power Electrical Safety Guidelines on page 188

• DC Power Electrical Safety Guidelines on page 189

• SRX650 Services Gateway Power Requirements on page 58

• Grounding the SRX650 Services Gateway on page 82

AC Power Electrical Safety Guidelines

CAUTION: For services gateways with AC power supplies, an external surge protective device (SPD) must be used at the AC power source.

The following electrical safety guidelines apply to AC-powered services gateways:

• AC-powered services gateways are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.

• You must provide an external certified circuit breaker rated minimum 15 A in the building installation.

• The power cord serves as the main disconnecting device. The socket outlet must be near the switch and be easily accessible.
• When a services gateway is equipped with multiple AC power supplies, all power cords (one for each power supply) must be unplugged to completely disconnect power to the switch.

• Note the following warnings printed on the label next to the power supplies:

  “CAUTION: THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK.”

  “ATTENTION: CET APPAREIL COMPORTE PLUS D’UN CORDON D’ALIMENTATION. AFIN DE PRÉVENIR LES CHOCs ÉLECTRIQUES, DÉBRANCHER TOUT CORDON D’ALIMENTATION AVANT DE FAIRE LE DÉPANNAGE.”

Power Cable Warning (Japanese)

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。

The preceding translates as follows:

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

Related Documentation

• SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
• In Case of Electrical Accident on page 187
• General Electrical Safety Guidelines and Warnings on page 187
• SRX650 Services Gateway Power Requirements on page 58
• Grounding the SRX650 Services Gateway on page 82

DC Power Electrical Safety Guidelines

When working with DC-powered equipment, observe the following guidelines and warnings:

• DC Power Electrical Safety Guidelines
• DC Power Disconnection Warning
• DC Power Grounding Requirements and Warning
• DC Power Wiring Sequence Warning
• DC Power Wiring Terminations Warning
DC Power Electrical Safety Guidelines

The following electrical safety guidelines apply to a DC-powered services gateway:

• A DC-powered services gateway is equipped with a DC terminal block that is rated for the power requirements of a maximally configured services gateway. To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 65 A @ –48 VDC for the system, or at least 48 A @ –48 VDC for each power supply. We recommend that the 48 VDC facility DC source be equipped with a circuit breaker rated at 60 A (–48 VDC) minimum, or as required by local code. 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 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 office (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 60 A.

• A DC-powered services gateway that is equipped with a DC terminal block is intended only for installation 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/NFPA 70.

• 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 services gateway and the supply side of the DC wiring.

• The marked input voltage of –48 VDC for a DC-powered services gateway is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.

• Because the services gateway 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

WARNING: Before performing any of the following 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 (O), and tape the switch handle of the circuit breaker in the off position (O).

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie 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 varsii 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 die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

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 executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el
interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

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 överspänningsskydds omkopplare i FRÅN-läget.

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**DC Power Grounding Requirements and Warning**

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors, but that 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 services gateway, you must always make the ground connection first and disconnect it last.

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

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

Attention Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée 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 a unidade, a ligaçao à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

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

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**DC Power Wiring Sequence Warning**
WARNING: Wire the DC power supply using the appropriate lugs. When connecting 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 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.

Varoitus Oikea kytkentäjärjestys on maajohto maajohtoon, +RTN varten +RTN, −48 V varten −48 V. Oikea irrotettava kytkentäjärjestys on −48 V varten −48 V, +RTN varten +RTN, maajohto maajohtoon.

Attention Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité du câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, +RTN à +RTN, puis −48 V à −48 V. En débranchant la puissance, l'ordre approprié de câblage est −48 V à −48 V, +RTN à +RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.


Avvertenza Mostrare la morsettiera dell'alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cavo di collegamento, come illustrato. La corretta sequenza di cavo è da massa a massa, da positivo a positivo (da linea a L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoples tilkoplesekvens er jord til jord, +RTN til +RTN, −48 V til −48 V. Riktig frakoples tilkoples tilkoplesekvens er −48 V til −48 V, +RTN til +RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, +RTN a +RTN, entonces −48 V a −48 V. Al desconectar potencia, la secuencia apropiada del cableado es −48 V a −48 V, +RTN a +RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.
DC Power Wiring Terminations Warning

**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 the 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 griperschop 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** Jossä ikäellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännettynä kilninyskorvat. Tällaisten liitäntöjen tulee olla kootaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

**Attention** Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

**Warnung** Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsanschlüsse, z.B. Ringoesen oder gabelförmige Kabelschuhe mit nach oben gerichteten Enden 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 treccce, usare connettori omologati, come quelli a occhiello o a forcella 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 lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilice terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropriado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

Warning! 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.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- In Case of Electrical Accident on page 187
- General Electrical Safety Guidelines and Warnings on page 187
- SRX650 Services Gateway Power Requirements on page 58
- Grounding the SRX650 Services Gateway on page 82
CHAPTER 32

Agency Approvals and Regulatory Compliance Information

• SRX650 Services Gateway Agency Approvals on page 197
• SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198
• Canada on page 198
• European Community on page 199
• Japan on page 199
• United States on page 199

SRX650 Services Gateway Agency Approvals

The services gateway complies with the following standards:

• Safety
  • EN 60950-1 (2001) Safety of Information Technology Equipment
  • IEC 60950-1 (2001) Safety of Information Technology Equipment (with country deviations)

• EMC
  • EN 300 386 V1.3.3 (2005) Telecom Network Equipment - EMC requirements

• EMI
  • FCC Part 15 Class A (2007) USA Radiated Emissions
  • EN 55022 Class A (2006) European Radiated Emissions
  • VCCI Class A (2007) Japanese Radiated Emissions
• Immunity
  • EN 55024 +A1+A2 (1998) Information Technology Equipment Immunity Characteristics
  • EN-61000-3-2 (2006) Power Line Harmonics
  • EN-61000-3-3 +A1 +A2 +A3 (1995) Power Line Voltage Fluctuations
  • EN-61000-4-2 +A1 +A2 (1995) Electrostatic Discharge
  • EN-61000-4-3 +A1+A2 (2002) Radiated Immunity
  • EN-61000-4-4 (2004) Electrical Fast Transients
  • EN-61000-4-5 (2006) Surge
  • EN-61000-4-6 (2007) Immunity to Conducted Disturbances
  • EN-61000-4-11 (2004) Voltage Dips and Sags

Related Documentation
• SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
• SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198

SRX650 Services Gateway Acoustic Noise Compliance Statements

The maximum emitted sound pressure level is 70 dB(A) or less per EN ISO 7779.

German Translation:
Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70 dB(A) oder weniger gemäss EN ISO 7779.

Related Documentation
• SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
• Lithium Battery on page 185

Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Related Documentation
• SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
• European Community on page 199
  • Israel
  • Japan on page 199
  • United States on page 199
  • SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198
European Community

This is a Class A product. In a domestic environment this product might cause radio interference in which case the user might be required to take adequate measures.

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Canada on page 198
- Israel
- Japan on page 199
- United States on page 199
- SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198

Japan

The preceding translates as follows:

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

Related Documentation
- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Canada on page 198
- European Community on page 199
- Israel
- United States on page 199
- SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198

United States

The services gateway has been tested and found to comply with the limits for a Class A digital device 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, might 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.
Related Documentation

- SRX650 Services Gateway General Safety Guidelines and Warnings on page 165
- Canada on page 198
- European Community on page 199
- Israel
- Japan on page 199
- SRX650 Services Gateway Acoustic Noise Compliance Statements on page 198