

J-series Services Router Release Notes for JUNOS 9.0 Software

Release 9.0R4
November 2008
Part Number: 530-022948-01
Revision 4

These release notes introduce the newest release of Juniper Networks J-series Services Routers and Release 9.0R4 of the JUNOS Internet software. They briefly describe J-series hardware features, identify known firmware and hardware problems, describe new J-Web features, and explain how to upgrade and downgrade the JUNOS Internet software and firmware on a Services Router.

You can also find these release notes on the Juniper Networks Technical Publications Web page located at <http://www.juniper.net/techpubs/>.

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J-series Services Router Features

This section describes the new J-series Services Routers features, available with the JUNOS 9.0R4 release. For more information, see the following manuals:

- *J2320, J2350, J4350, and J6350 Services Router Getting Started Guide*
- *J2300, J4300, and J6300 Services Router Getting Started Guide*
- *J-series Services Router Basic LAN and WAN Access Configuration Guide*
- *J-series Services Router Advanced WAN Access Configuration Guide*
- *J-series Services Router Administration Guide*

For more information about the JUNOS Internet software that runs on Services Routers, see the manuals listed in Table 5 on page 15.

Platform and Infrastructure

- **Port mirroring and enhanced packet capture.** Port mirroring sends a copy of all network packets received on one switch port to a network monitoring connection on another switch port for analysis. Port mirroring is used for network applications such as intrusion detection systems that require monitoring of network traffic.

With packet capture, you can now capture packets with Multilink Point-to-Point Protocol (MLPP) and Multilink Frame Relay (MFR) encapsulation for analysis.

MPLS Applications

- **Support for point-to-multipoint MPLS LSPs.** A point-to-multipoint MPLS label-switched path (LSP) is a Resource Reservation Protocol (RSVP)-signaled LSP with a single source and multiple destinations. By taking advantage of the MPLS packet replication capability of the network, point-to-multipoint LSPs avoid unnecessary packet replication at the inbound router. Packet replication takes place only when packets are forwarded to two or more different destinations requiring different network paths.

Point-to-multipoint LSPs allow you to

- Use MPLS for point-to-multipoint data distribution. This functionality is similar to that provided by IP multicast.
- Add and remove branch LSPs from a main point-to-multipoint LSP without disrupting traffic. The unaffected parts of the point-to-multipoint LSP continue to function normally.

- Configure a Services Router to be both a transit router and an egress router for different branch LSPs of the same point-to-multipoint LSP.

Outstanding Issues

The following problems currently exist in J-series Services Routers. The identifier following the description is the tracking number in the Juniper Networks bug database.

Platform and Infrastructure

- For J-series Services Routers, if you send a real-time performance monitoring (RPM) probe through an IPSec tunnel and the probe includes the `hardware-timestamp` statement at the `[edit services rpm probe owner-name test test-name]` hierarchy level, RPM ICMP ping probes might not work. [PR/75927]
- On J-series Services Routers, you cannot use a USB device that provides U3 features (such as the U3 Titanium device from SanDisk Corporation) as the media device during system boot. You must remove the U3 support before using the device as a boot medium. For the U3 Titanium device, you can use the U3 Launchpad Removal Tool on a Windows-based system to remove the U3 features. The tool is available for download at <http://www.sandisk.com/Retail/Default.aspx?CatID=1415>. (To restore the U3 features, use the U3 Launchpad Installer Tool accessible at <http://www.sandisk.com/Retail/Default.aspx?CatID=1411>). [PR/102645]
- On J2320, J2350, J4350, and J6350 Services Routers, when you press the F10 key to save and exit from BIOS configuration mode, the operation might not work as expected. As a workaround, use the **Save and Exit** option from the **Exit** menu. This issue can be seen on the J4350 and J6350 routers with BIOS Version 080011 and on the J2320 and J2350 routers with BIOS Version 080012. [PR/237721]
- On J2320, J2350, J4350, and J6350 Services Routers, the **Clear NVRAM** option in the BIOS configuration mode does not work as expected. This issue can be seen on the J4350 and J6350 routers with BIOS Version 080011 and on the J2320 and J2350 routers with BIOS Version 080012. To help mitigate this issue, note any changes you make to the BIOS configuration so that you can revert to the default BIOS configuration as needed. [PR/237722]

Interfaces and Chassis

- For ISDN dialer interfaces, when you configure the `no-keepalives` statement at the `[edit interfaces d10 unit logical-unit-number]` hierarchy level and you issue the `show interfaces d10` command, the Link flags field might still show keepalives. [PR/58520]
- If you disable a services interface by including the `disable` statement at the `[edit interfaces sp-pim/0/port]` hierarchy level and then delete the `disable` statement from the configuration, IPSec service is not reset correctly. As a workaround, either issue the `deactivate services` command followed by the `activate services` command, or issue the `request chassis pic offline fpc-slot pim-slot pic-slot 0` command followed by the `request chassis pic online fpc-slot pim-slot pic-slot 0` command. [PR/58522]

- On ISDN interfaces in a J-series Services Router, if you include the `vrf-table-label` statement at the `[edit routing-instances instance-name]` hierarchy level, packets might be dropped from the connection. [PR/59718]
- On ISDN dialer interfaces, if you configure the `minimum-links` statement at the `[edit interfaces dlo unit logical-unit-number]` hierarchy level and then deactivate the BRI interface associated with the dialer interface, the output packets counter displayed in the output of the `show interfaces dlo` command might continue to increment. [PR/59986]
- On ISDN dialer interfaces in a J-series Services Router, when you include the `load-threshold 100` statement at the `[edit interfaces dlo unit logical-unit-number dialer-options]` hierarchy level and the 56-Kbps bandwidth threshold is exceeded, the interface does not support additional network traffic and might not activate another BRI interface. [PR/60045]
- J4350 and J6350 Services Routers might not have the requisite data buffers needed to meet expected delay-bandwidth requirements. Lack of data buffers might degrade CoS performance with smaller-sized (500 bytes or less) packets. [PR/73054]
- On J4350 and J6350 Services Routers, when an Avaya VoIP TGM550 module is in reset state, the Services Router might not respond to `show chassis` commands for up to 5 seconds. [PR/78695]
- If the MTU is set to more than 6 KB for a built-in Gigabit Ethernet port or a 1-port Gigabit Ethernet ePIM, packets might be discarded with an FCS error. [PR/82245]
- On serial interfaces transmitting either 64-byte or 128-byte packets, the effective bandwidth falls when the interface is highly oversubscribed. [PR/235753]
- On channelized E1 interfaces, you might be able to configure clocking on `ds-pim/0/port:n` interfaces, where *n* is not unit 0. This is an invalid configuration and might cause a clocking selection problem on the other channels. [PR/24722]

Resolved Issues

The following issue has been resolved since JUNOS Release 9.0R3:

- User cannot log in to the J-Web client through RADIUS or TACACS+ authentication if the user profile already has authorization parameters specified on the server side. [PR/94445: This issue has been resolved.]

Power and Heat Dissipation Requirements for J-series PIMs

On J-series Services Routers, the system monitors the PIMs and verifies that the PIMs fall within the power and heat dissipation capacity of the chassis. If power management is enabled and the capacity is exceeded, the system prevents one or more of the PIMs from becoming active.



CAUTION: Disabling power management can result in hardware damage if you overload the chassis capacities.

You can also use CLI commands to choose which PIMs are disabled. For details about calculating the power and heat dissipation capacity of each PIM and troubleshooting procedures, see the *J2320, J2350, J4350, and J6350 Services Router Getting Started Guide*.

Supported Third-Party Hardware

The following third-party hardware is supported for use with J-series Services Routers.

USB Modem

We recommend using a Multi-Tech MultiModem MT5634ZBA-USB-V92 USB modem with J-series Services Routers.

Storage Devices

The USB slots on J-series Services Routers accept a USB storage device or USB storage device adapter with a compact flash disk installed, as defined in the *CompactFlash Specification* published by the CompactFlash Association. When the USB device is installed and configured, it automatically acts as a secondary boot device if the primary compact flash disk fails on startup. Depending on the size of the USB storage device, you can also configure it to receive any core files generated during a router failure. The USB device must have a storage capacity of at least 256 MB.

Table 1 on page 6 lists USB and compact flash storage devices supported for use with the J-series routers.

Table 1: Supported Storage Devices on the J-series Services Routers

Manufacturer	Storage Capacity	Third-Party Part Number
SanDisk—Cruzer Mini 2.0	256 MB	SDCZ2-256-A10
SanDisk	512 MB	SDCZ3-512-A10
SanDisk	1024 MB	SDCZ7-1024-A10
Kingston	512 MB	DTI/512KR
Kingston	1024 MB	DTI/1GBKR
SanDisk—ImageMate USB 2.0 Reader/Writer for CompactFlash Type I and II	N/A	SDDR-91-A15
SanDisk CompactFlash	512 MB	SDCFB-512-455
SanDisk CompactFlash	1 GB	SDCFB-1000-A10

J-series Compact Flash and Memory Requirements

Table 2 on page 7 lists the compact flash and DRAM requirements for all J-series Services Routers.

Table 2: J-series Compact Flash and DRAM Requirements

Model	Minimum Compact Flash Required	Minimum DRAM Required	Maximum DRAM Supported
J2300	256 MB	256 MB	1 GB
J2320	256 MB	256 MB	2 GB
J2350	256 MB	256 MB	2 GB
J4300	256 MB	256 MB	1 GB
J4350	256 MB	256 MB	2 GB
J6300	256 MB	256 MB	1 GB
J6350	256 MB	1 GB	2 GB

J-series Upgrade and Downgrade Instructions

In JUNOS Release 8.5, the JUNOS software was extended to use FreeBSD version 6.1. As a result, the following requirements apply when you upgrade your router to JUNOS Release 8.5 and later:

- To upgrade with the JUNOS CLI, the minimum requirement for installation media (such as a CompactFlash card, internal flash disk, or PC Card) is 256 MB. To use the J-Web interface for an upgrade, you must have 512 MB or more.
- For J-series Services Routers with a 256-MB CompactFlash card:
 - You must perform the upgrade with the CLI. Do not use the J-Web interface for the upgrade.
 - Before upgrading to this release, see the important information in “Special Instructions for J-series Routers with a 256-MB CompactFlash Card” on page 15.
- When upgrading from JUNOS Release 8.2 or earlier, upgrade to an interim JUNOS Release 8.3 or later first. (Alternatively, you can use the `no-validate` option with the `request system software add` command, but we do not recommend this upgrade method.)

If the router is running a software version earlier than JUNOS Release 7.2R3 or 7.3R2, you might need to upgrade to one of these interim software releases before you can upgrade to JUNOS Release 8.3 or later.

This section contains the following topics:

- Upgrade and Downgrade Overview on page 8
- Before You Begin on page 9
- Downloading Software Upgrades from Juniper Networks on page 9
- Installing Software Upgrades with the J-Web Interface on page 10
- Installing Software Upgrades with the CLI on page 11
- Downgrade Instructions on page 13
- Special Instructions for J-series Routers with a 256-MB CompactFlash Card on page 15

Upgrade and Downgrade Overview

Typically, you upgrade the JUNOS software on a Services Router by downloading a set of images onto your router or onto another system on your local network, such as a PC. You then uncompress the package and install the uncompressed software using the CLI. Finally, you boot your system with this upgraded device.

A JUNOS software package is a collection of files that make up a software component. You can download software packages either for upgrading JUNOS software or for recovering a primary CompactFlash card.

All JUNOS software is delivered in signed packages that contain digital signatures, Secure Hash Algorithm (SHA-1) checksums, and Message Digest 5 (MD5) checksums. For more information about JUNOS software packages, see the *JUNOS Software Installation and Upgrade Guide*.

Upgrade Software Packages

Download an upgrade software package, also known as an install package, to install new features and software fixes as they become available.

An upgrade software package name is in the following format:

package-name-m.nZx-distribution.tgz.

- *package-name* is the name of the package—for example, *junos-jseries*.
- *m.n* is the software release, with *m* representing the major release number—for example, *8.0*.
- *Z* indicates the type of software release. For example, *R* indicates released software, and *B* indicates beta-level software.
- *x* represents the version of the major software release—for example, *2*.
- *distribution* indicates the area for which the software package is provided—*domestic* for the United States and Canada and *export* for worldwide distribution.

A sample J-series upgrade software package name is *junos-jseries-8.0R2-domestic.tgz*.

Recovery Software Packages

Download a recovery software package, also known as an install media package, to recover a primary compact flash device.

A recovery software package name is in the following format:

package-name-m.nZx-export-cfnnn.gz.

- *package-name* is the name of the package—for example, *junos-jseries*.
- *m.n* is the software release, with *m* representing the major release number—for example, 8.0.
- *Z* indicates the type of software release. For example, *R* indicates released software, and *B* indicates beta-level software.
- *x* represents the version of the major software release—for example, 2.
- *export* indicates that the recovery software package is the exported worldwide software package version.
- *cfnnn* indicates the size of the target CompactFlash device in megabytes—for example, *cf256*.

A sample J-series recovery software package name is *junos-jseries-8.0R2-export-cf256.gz*.

Before You Begin

Before upgrading, be sure to back up the currently running and active file system and configuration so that you can recover to a known, stable environment in case the upgrade is unsuccessful. To back up the file system, you must have a removable compact flash disk installed on a J4300 or J6300 Services Router, or a USB drive installed on any J-series Services Router. The backup device must have a storage capacity of at least 256 MB.

To back up the file system to the removable CompactFlash card, issue the following command:

```
user@host> request system snapshot media removable-compact-flash
```

To back up the file system to the removable USB drive, issue the following command:

```
user@host> request system snapshot media usb
```

Downloading Software Upgrades from Juniper Networks

Follow these steps to download software upgrades from Juniper Networks:

1. Using a Web browser, follow the links to the download URL on the Juniper Networks Web page. Depending on your location, select either **Canada and U.S. Version** or **Worldwide Version**:
 - <https://www.juniper.net/support/csc/swdist-domestic/> (customers in the United States and Canada)
 - <https://www.juniper.net/support/csc/swdist-ww/> (all other customers)
2. Log in to the Juniper Networks Web site using the username (generally your e-mail address) and password supplied by Juniper Networks representatives.
3. Using the J-Web interface or the CLI, select the appropriate junos-j-series software package for your application. For information about JUNOS software packages, see “Upgrade and Downgrade Overview” on page 8.
4. Download the software to a local host or to an internal software distribution site.



NOTE: For downloads to J-series Services Routers with a 256-MB CompactFlash card, see “Special Instructions for J-series Routers with a 256-MB CompactFlash Card” on page 15.

Installing Software Upgrades with the J-Web Interface

If your router has at least a 512-MB CompactFlash card, you can use the J-Web interface to install software upgrades from a remote server using FTP or HTTP, or by uploading the software image to the router. This section contains the following topics:

- Installing Software Upgrades from a Remote Server on page 10
- Installing Software Upgrades by Uploading Files on page 11

Installing Software Upgrades from a Remote Server

If your router has at least a 512-MB CompactFlash card, you can use the J-Web interface to install software packages on the router that are retrieved with FTP or HTTP from the location specified.

To install software upgrades from a remote server:

1. Download the software package as described in “Downloading Software Upgrades from Juniper Networks” on page 9.
2. In the J-Web interface, select **Manage > Software > Install Package**.
3. On the Install Package page, enter information into the fields described in Table 3 on page 11.
4. Click **Fetch and Install Package**. The software is activated after the router has rebooted.

Table 3: Install Package Summary

Field	Function	Your Action
Package Location (required)	Specifies the FTP or HTTP server, file path, and software package name.	Type the full address of the software package location on the FTP or HTTP server—one of the following: ftp://hostname/pathname/package-name http://hostname/pathname/package-name
User	Specifies the username, if the server requires one.	Type the username.
Password	Specifies the password, if the server requires one.	Type the password.
Reboot If Required	If this box is checked, the router is automatically rebooted when the upgrade is complete.	Check the box if you want the router to reboot automatically when the upgrade is complete.

Installing Software Upgrades by Uploading Files

If your router has at least a 512-MB CompactFlash device, you can use the J-Web interface to install software packages uploaded from your computer to the router.

To install software upgrades by uploading files:

1. Download the software package as described in “Downloading Software Upgrades from Juniper Networks” on page 9.
2. In the J-Web interface, select **Manage > Software > Upload Package**.
3. On the Upload Package page, enter information into the fields described in Table 4 on page 11.
4. Click **Upload Package**. The software is activated after the router has rebooted.

Table 4: Upload Package Summary

Field	Function	Your Action
File to Upload (required)	Specifies the location of the software package.	Type the location of the software package, or click Browse to navigate to the location.
Reboot If Required	If this box is checked the router is automatically rebooted when the upgrade is complete.	Select the check box if you want the router to reboot automatically when the upgrade is complete.

Installing Software Upgrades with the CLI

You can use the CLI to install software upgrades from a remote server using FTP or by downloading the software image to the router. If your router has a 256-MB

CompactFlash device, see “Special Instructions for J-series Routers with a 256-MB CompactFlash Card” on page 15.

This section contains the following topics:

- Installing Software Upgrades by Downloading Files on page 12
- Installing Software Upgrades from a Remote Server on page 13

Installing Software Upgrades by Downloading Files

To install software upgrades by downloading files to the router:

1. Download the JUNOS software package to the router using the following command:

```
user@host> file copy source destination
```

Replace *source* with one of the following paths:

- `ftp://hostname/pathname/package-name`
- or
- `http://hostname/pathname/package-name`

Replace *destination* with the path to the destination directory on the router. We recommend the `/var/tmp` directory.

2. Install the new package on the Services Router, entering the following command in operational mode in the CLI:

```
user@host> request system software add validate unlink no-copy source
```

Replace *source* with `/pathname/package-name` (for example, `/var/tmp/junos-jsr-8.5R2.1.tar.gz`).

By default, the `request system software add` command uses the `validate` option to validate the software package against the current configuration as a prerequisite to adding the software package. This validation ensures that the router can reboot successfully after the software package is installed. This is the default behavior when you are adding a software package.

The `unlink` option removes the package at the earliest opportunity so that the router has enough room to complete the installation.

(Optional) The `no-copy` option specifies that a software package is installed, but a copy of the package is not saved. Include this option if you do not have enough space on the compact flash to perform an upgrade that keeps a copy of the package on the router.

3. After the software package is installed, reboot the router:

```
user@host> request system reboot
```

When the reboot is complete, the router displays the login prompt.

Installing Software Upgrades from a Remote Server

To install the software upgrades from a remote server:

1. Install the JUNOS software package on the Services Router, entering the following command in operational mode in the CLI:

```
user@host> request system software add validate unlink no-copy source
```

Replace *source* with one of the following paths:

- ftp://hostname/pathname/package-name

or

- http://hostname/pathname/package-name

By default, the `request system software add` command uses the `validate` option to validate the software package against the current configuration as a prerequisite to adding the software package. This validation ensures that the router can reboot successfully after the software package is installed. This is the default behavior when you are adding a software package.

The `unlink` option removes the package at the earliest opportunity so that the router has enough room to complete the installation.

(Optional) The `no-copy` option specifies that a software package is installed, but a copy of the package is not saved. Include this option if you do not have enough space on the CompactFlash card to perform an upgrade that keeps a copy of the package on the router.

2. After the software package is installed, reboot the router:

```
user@host> request system reboot
```

When the reboot is complete, the router displays the login prompt.

Downgrade Instructions

This section contains the following topics:

- Downgrading the Software with the J-Web Interface on page 14
- Downgrading the Software with the CLI on page 14



NOTE: Juniper Networks supports direct software downgrades for a maximum of three releases. For example, if your routing platform is running JUNOS Release 7.6, you can typically downgrade without problems to Release 7.3. If you attempt to downgrade more than three releases and validation of your configuration fails, we recommend downgrading to an intermediate release first before downgrading to the desired release.

Downgrading the Software with the J-Web Interface

You can downgrade the software from the J-Web interface. For the changes to take effect, you must reboot the router.

To downgrade software:

1. In the J-Web interface, select **Manage > Software > Downgrade**. The image of the previous software version (if any) is displayed on this page.



NOTE: After you perform this operation, you cannot undo it.

2. Select **Downgrade** to downgrade to the previous version of the software or **Cancel** to cancel the downgrade process.
3. When the downgrade process is complete, for the new software to take effect, select **Manage > Reboot** from the J-Web interface to reboot the router.

After you downgrade the software, the previous release is loaded, and you cannot reload the running version of software again. To downgrade to an earlier version of software, follow the procedure for upgrading, using the JUNOS software image labeled with the appropriate release.

Downgrading the Software with the CLI

You can revert to the previous version of software using the `request system software rollback` command in the CLI. For the changes to take effect, you must reboot the router. To downgrade to an earlier version of software, follow the procedure for upgrading, using the JUNOS software image labeled with the appropriate release.

To downgrade software with the CLI:

1. Enter the `request system software rollback` command to return to the previous JUNOS software version:

```
user@host> request system software rollback
```

The previous software version is now ready to become active when you next reboot the router.

2. Reboot the router:

```
user@host> request system reboot
```

The router is now running the previous version of the software. To downgrade to an earlier version of software, follow the procedure for upgrading, using the JUNOS software image labeled with the appropriate release.

Special Instructions for J-series Routers with a 256-MB CompactFlash Card

For upgrading from JUNOS Release 8.5 or any 9.0 version earlier than 9.0R3, first upgrade to 8.5R3 or 9.0R2 to change to the flash utilization that will enable the system to load JUNOS 9.2R2.

Related Juniper Networks Documentation

Table 5 on page 15 lists and describes the publications for J-series Services Routers, the JUNOS CLI, the JUNOScript application programming interface (API), and the JUNOScope network management software.

Table 5: Juniper Networks Technical Documentation

Title	Description
J-series Guides	
<i>Getting Started Guide</i>	Provides an overview, basic instructions, and specifications for J-series Services Routers. The guide explains how to prepare your site for installation, unpack and install the router and its components, install licenses, and establish basic connectivity. Use the Getting Started Guide for your router model.
<i>J-series Services Router Basic LAN and WAN Access Configuration Guide</i>	Explains how to configure the interfaces on J-series Services Routers for basic IP routing with standard routing protocols, ISDN backup, and digital subscriber line (DSL) connections.
<i>J-series Services Router Advanced WAN Access Configuration Guide</i>	Explains how to configure J-series Services Routers in virtual private networks (VPNs) and multicast networks, configure data link switching (DLSw) services, and apply routing techniques such as policies, stateless and stateful firewall filters, IP Security (IPsec) tunnels, and class-of-service (CoS) classification for safer, more efficient routing.
<i>J-series Services Router Administration Guide</i>	Shows how to manage users and operations, monitor network performance, upgrade software, and diagnose common problems on J-series Services Routers.
JUNOS Configuration Guides	
<i>JUNOS Access Privilege Guide</i>	Explains how to configure access privileges in user classes by using permission flags and regular expressions. Lists the permission flags along with their associated command-line interface (CLI) operational mode commands and configuration statements.
<i>JUNOS Class of Service Configuration Guide</i>	Provides an overview of the class-of-service (CoS) functions of the JUNOS software and describes how to configure CoS features, including configuring multiple forwarding classes for transmitting packets, defining which packets are placed into each output queue, scheduling the transmission service level for each queue, and managing congestion through the random early detection (RED) algorithm.
<i>JUNOS CLI User Guide</i>	Describes how to use the JUNOS command-line interface (CLI) to configure, monitor, and manage Juniper Networks routing platforms. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .
<i>JUNOS Feature Guide</i>	Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.

Table 5: Juniper Networks Technical Documentation (continued)

Title	Description
<i>JUNOS High Availability Configuration Guide</i>	Provides an overview of hardware and software resources that ensure a high level of continuous routing platform operation and describes how to configure high availability (HA) features such as nonstop routing (NSR) and graceful Routing Engine switchover (GRES).
<i>JUNOS MPLS Applications Configuration Guide</i>	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
<i>JUNOS Multicast Protocols Configuration Guide</i>	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
<i>JUNOS Multiplay Solutions Guide</i>	Describes how you can deploy IPTV and voice over IP (VoIP) services in your network.
<i>JUNOS Network Interfaces Configuration Guide</i>	Provides an overview of the network interface functions of the JUNOS Internet software and describes how to configure the network interfaces on the routing platform.
<i>JUNOS Network Management Configuration Guide</i>	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP and accounting options.
<i>Secure Configuration Guide for Common Criteria and JUNOS-FIPS</i>	Provides an overview of secure Common Criteria and JUNOS-FIPS protocols for the JUNOS Internet software and describes how to install and configure secure Common Criteria and JUNOS-FIPS on a routing platform.
<i>JUNOS Software Installation and Upgrade Guide</i>	Provides a description of JUNOS software components and packaging, and includes detailed information about how to initially configure, reinstall, and upgrade the JUNOS system software. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .
<i>JUNOS Policy Framework Configuration Guide</i>	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, forwarding options, and cflowd.
<i>JUNOS Routing Protocols Configuration Guide</i>	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.
<i>JUNOS Services Interfaces Configuration Guide</i>	Provides an overview of the services interfaces functions of the JUNOS software and describes how to configure the services interfaces on the router.
<i>JUNOS System Basics Configuration Guide</i>	Describes Juniper Networks routing platforms, and provides information about how to configure basic system parameters, supported protocols and software processes, authentication, and a variety of utilities for managing your router on the network.
<i>JUNOS VPNs Configuration Guide</i>	Provides an overview and describes how to configure Layer 2 and Layer 3 virtual private networks (VPNs), virtual private LAN service (VPLS), and Layer 2 circuits. Provides configuration examples.
JUNOS References	
<i>JUNOS Hierarchy and RFC Reference</i>	Describes the JUNOS <i>configuration mode</i> commands. Provides a hierarchy reference that displays each level of a configuration hierarchy and includes all possible configuration statements that can be used at that level. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .

Table 5: Juniper Networks Technical Documentation (continued)

Title	Description
<i>JUNOS System Basics and Services Command Reference</i>	Describes the JUNOS software <i>operational mode</i> commands you use to monitor and troubleshoot system basics, including commands for real-time monitoring and route (or path) tracing, system software management, and chassis management. This guide also describes commands for monitoring and troubleshooting services such as class of service (CoS), IP Security (IPsec), stateful firewalls, flow collection, and flow monitoring.
<i>JUNOS Interfaces Command Reference</i>	Describes the JUNOS software <i>operational mode</i> commands you use to monitor and troubleshoot interfaces.
<i>JUNOS Routing Protocols and Policies Command Reference</i>	Describes the JUNOS software <i>operational mode</i> commands you use to monitor and troubleshoot routing policies and protocols, including firewall filters.
<i>JUNOS System Log Messages Reference</i>	Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message.
JUNOS API and Scripting Documentation	
<i>JUNOScript API Guide</i>	Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routers.
<i>JUNOS XML API Configuration Reference</i>	Provides reference pages for the configuration tags in the JUNOScript API.
<i>JUNOS XML API Operational Reference</i>	Provides reference pages for the operational tags in the JUNOScript API.
<i>JUNOS Configuration and Diagnostic Automation Guide</i>	Describes how to use the commit script and self-diagnosis features of the JUNOS software. This guide explains how to enforce custom configuration rules defined in scripts, how to use commit script macros to provide simplified aliases for frequently used configuration statements, and how to configure diagnostic event policies.
NETCONF API Guide	Describes how to use the NETCONF API to monitor and configure Juniper Networks routing platforms.
JUNOScope Software Documentation	
<i>JUNOScope Software User Guide</i>	Describes the JUNOScope software graphical user interface (GUI), how to install and administer the software, and how to use the software to manage router configuration files and monitor router operations.
Release Notes	
<i>J-series Services Router Release Notes</i>	Summarize new features, identify hardware problems, provide information omitted from the manual, and contain upgrade and downgrade instructions.
<i>JUNOS Release Notes</i>	Summarize new features for a particular software release, provide corrections and updates to published JUNOS and JUNOScript manuals, provide information that might have been omitted from the manuals, and describe upgrade and downgrade procedures.
<i>JUNOScope Release Notes</i>	Contain corrections and updates to the published JUNOScope manual, provide information that might have been omitted from the manual, and describe upgrade and downgrade procedures.

Documentation Feedback

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

- Document name
- Document part number
- Page number
- Software release version (not required for *Network Operations Guides [NOGs]*)

Requesting Technical Support

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

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/customers/support/downloads/710059.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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

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

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

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

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

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

If you are reporting a hardware or software problem, issue the following command from the CLI before contacting support:

```
user@host> request support information | save filename
```

To provide a core file to Juniper Networks for analysis, compress the file with the `gzip` utility, rename the file to include your company name, and copy it to [ftp.juniper.net:pub/incoming](ftp://ftp.juniper.net/pub/incoming). Then send the filename, along with software version information (the output of the `show version` command) and the configuration, to support@juniper.net. For documentation issues, fill out the bug report form located at <https://www.juniper.net/cgi-bin/docbugreport/>.

Revision History

November 2008— Revision 4, JUNOS Software Release 9.0R4

August 2008— Revision 3, JUNOS Software Release 9.0R3

March 2008— Revision 2, JUNOS Software Release 9.0R2

14 February 2008— Revision 1, JUNOS Software Release 9.0R1

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