J-series Services Router Release Notes for JUNOS 8.4

Release 8.4R4
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These release notes introduce the newest release of Juniper Networks J-series Services Routers and Release 8.4R4 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.

For information about software features and problems, see the *JUNOS Internet Software Release Notes*. You can find the release notes on the Juniper Networks Technical Publications Web page, which is located at http://www.juniper.net/techpubs/.

Contents

J-series Services Router Features

This section describes the new J-series Services Routers features, available with the JUNOS 8.4R4 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*

Interfaces and Chassis

- **New J2320 and J2350 Services Routers**—The J2320 and J2350 Services Routers enhance and extend the capabilities of the existing J2300 Services Router. They provide significantly improved performance and a modular architecture for increased flexibility.

  The J2320 Services Router occupies 1 rack unit (RU), uses AC power, and provides three input/output (I/O) slots.

  The J2350 Services Router occupies 1.5 RUs, uses AC or DC power, and provides five I/O slots.

  The new Services Routers support the same JUNOS functionality as the J2300 Services Router, and offer the following additional features:

  - Removable Physical Interface Modules (PIMs).
  - Support for Gigabit Ethernet uPIMs, Avaya voice over IP (VoIP) modules, and all other existing J-series PIMs (except the DS3 or E3 PIM and the 1–port Gigabit Ethernet ePIM).
  - Four built-in Gigabit Ethernet ports that serve as the primary LAN link connections. Each port supports link speeds of 10, 100, or 1000 megabits per second (Mbps).
  - An optional Crypto Accelerator Module that enhances performance of cryptographic algorithms used in IP Security (IPsec) services. A Services Router without the Crypto Accelerator Module uses the existing software-based OpenSSL implementation of IPsec algorithms.
  - A time-division multiplexing (TDM) midplane to support VoIP services.

  [*J2320, J2350, J4350, and J6350 Services Router Getting Started Guide*]

- **New 1-port SFP Gigabit Ethernet uPIM**—A new 1-port Gigabit Ethernet uPIM provides small form-factor pluggable (SFP) connectors for use with a variety of copper and optical interfaces. The uPIM can be installed in either high-speed or regular slots on the J2320, J2350, J4350, and J6350 Services Routers. [*J2320,*

J2350, J4350, and J6350 Services Router Getting Started Guide, *J-series Services Router Basic LAN and WAN Access Configuration Guide*]

- **Ethernet Layer 2 switching for uPIMs**—J-series 16-port, 8-port, and 6-port Gigabit Ethernet uPIMs can now forward traffic at both Open Systems Interconnection (OSI) Layer 2 (for switching) and OSI Layer 3 (for routing). You can configure a uPIM to operate in routing mode (the default) or switching mode. Routing mode provides traditional routing. Switching mode provides the following features:
  - Layer 3 forwarding—The ability to route traffic destined for WAN interfaces—interfaces on other PIMs installed in the chassis
  - Layer 2 forwarding—The ability to switch intra-LAN traffic from one host on the LAN to another LAN host—one port on a uPIM to another port on the same uPIM

  To enable switching mode, include the switching option at the [edit chassis fpc *fpc-slot-number* pic *pic-slot-number* ethernet pic-mode] hierarchy level. To enable routing mode, include the routing option at the same hierarchy level. To view Layer 2 switching statistics, issue the show interfaces *interface-name* switch-port *port-number* command. To clear the Layer 2 switching statistics, issue the clear interfaces statistics *interface-name* switch-port *port-number* command.

NOTE: Gigabit Ethernet uPIMs provide no 802.1q virtual LAN or spanning-tree support. 802.1q VLAN tags are supported on routed uPIM interfaces.

[*J-series Services Router Basic LAN and WAN Access Configuration Guide*]

- **Power management**—On J-series Services Routers, the system monitors the PIMs and verifies that a newly inserted PIM falls within the power capacity of the chassis. CLI commands allow you to choose which PIM to turn off if the power capacity is exceeded. For more information, see "Power and Heat Dissipation Requirements for J-series PIMs" on page 8. [*J2320, J2350, J4350, and J6350 Services Router Getting Started Guide*]
- **New commands for Avaya VoIP modules (J-series Services Routers only)**—The following operational mode commands provide better access to and more information about the Avaya VoIP modules:
  - request tgm login fpc *slot-number* user *username*—Enables users to log in to the TGM550 Telephony Gateway Module easily.
  - show tgm fpc *slot-number* dsp-capacity—Shows the DSP capacity of the TGM board in terms of the number of voice channels that it can support—for example, 10, 20, or 80 channels.
  - show tgm telephony-interface-module status—Displays the status of Telephony Interface Modules (TIMs).
- **Support for high-density TIMs**—J-series Services Routers now support the following high-density Telephony Interface Modules (TIMs) for Avaya VoIP service:
  - TIM508—Avaya TIM with 8 analog telephone ports. You can configure these ports as direct inward dialing (DID) trunk ports.

- TIM516—Avaya TIM with 16 analog telephone ports. You can configure 8 of these ports as DID trunk ports.
- TIM518—Avaya TIM with 8 analog telephone ports and 8 analog trunk ports. You can configure some or all of the analog telephone (LINE) ports as analog DID trunk ports.

- **Lower-DSP-capacity Avaya TGM550 modules for VoIP services (J-series Services Routers)**—For VoIP deployments that require fewer voice channels, J-series Services Routers now support Avaya TGM550 Terminal Gateway Modules (TGMs) with low-density digital signal processors (DSPs) that provide 10 or 20 channels. [*J-series Services Router Basic LAN and WAN Access Configuration Guide*]

Changes in Default Behavior and Syntax

- **SFP information included in operational command output (J-series Services Routers)**—For 6-port Gigabit Ethernet uPIMs with small form-factor pluggable transceivers (SFPs) on J-series Services Routers, the show chassis hardware command output now displays information about the SFPs.
- **Behavior change for PAP (J-series Services Routers)**—If you configure passive mode for Password Authentication Protocol (PAP) on an ATM interface configured for Point-to-Point Protocol over Ethernet (PPPoE) over ATM, the router no longer indicates that it can be the Link Control Protocol (LCP) authenticator during LCP negotiations. Previously, the router did indicate it could be the LCP authenticator, even in passive mode.
- **Operational mode output change (J2320, J2350, J4350, and J6350 Services Routers)**—Previously, the show chassis fpc command output for selected J-series Services Routers showed just the slot into which a 2-slot-high PIM was physically inserted. Now the output of the show chassis fpc, show chassis fpc *slot*, and show chassis fpc *slot* detail commands also indicate the slot that is unusable.

Outstanding Issues

User Interface and Configuration

- A 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. As a workaround, ensure that the user profile parameters are not specified or are set with empty values on the server. [PR/94445]

Platform and Infrastructure

- 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 external media. For the U3 Titanium device, you can use the U3 Launchpad Removal Tool on a Microsoft Windows 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,

you can 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, you should note any changes you make to the BIOS configuration. This allows you to revert to the default BIOS configuration as needed. [PR/237722]

Interfaces and Chassis

- 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]
- On channelized T3 interfaces, the T1 loopback state does not reflect loopbacks set by facilities data link requests using the remote-loopback-respond statement at the [edit interfaces *interface-name* t1-options] hierarchy level. [PR/45837]
- For ISDN dialer interfaces, when you configure the no-keepalives statement at the [edit interfaces dl0 unit *logical-unit-number*] hierarchy level and you issue the show interfaces dl0 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]
- When you take an ISDN interface offline, the LEDs on the ISDN PIM might not turn off. [PR/59536]
- 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 dl0 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 dl0 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 dl0 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]
- If you ping a nonexistent IPv6 address that belongs to the same subnet as an existing point-to-point link, the packet loops between the two point-to-point interfaces until the time-to-live timer expires. [PR/94954]
- On J-series Services Routers running JUNOS Release 8.3 or later, a Channelized T1/E1/ISDN PRI PIM running firmware version 2.3 or earlier might not initialize or might have clocking problems. After an upgrade to JUNOS 8.3 or later, verify the firmware version of any Channelized T1/E1/ISDN PRI PIM by issuing the show system firmware command. If the firmware version is not 2.4 or later, contact Juniper Networks customer support. [PR/102638]

Resolved Issues

The following issue has been resolved since JUNOS Release 8.4R3:

- A J4350 or J6350 router running JUNOS Release 8.0 were not functioning properly when the Channelized T1/E1/ISDN PRI PIM or the Avaya TGM550, TIM510, TIM514, or TIM521 VoIP modules were installed on the router. [PR/74308: This issue has been resolved.]

Errata

- J-Web Quick Configuration pages do not support IPv6 addressing and routing. [*J-series Services Router Basic LAN and WAN Access Configuration Guide*]
- For 4-port Fast Ethernet ePIMs on J-series Services Routers, if you apply a CoS scheduler map on outgoing (egress) traffic, the router does not divide the bandwidth appropriately among the CoS queues. As a workaround, configure enforced CoS shaping on the ports. [*J-series Services Router Advanced WAN Access Configuration Guide*]
- On J-series Services Routers, if you create a policy to match IPv4 traffic with a route filter and assign the traffic to a forwarding class, then apply the policy at the [edit class-of-service forwarding-policy class *policy-name*] hierarchy level, use of the classification-override statement at the [edit class-of-service forwarding-policy class *policy-name*] hierarchy level is not supported. [*J-series Services Router Advanced WAN Access Configuration Guide*]

Power and Heat Dissipation Requirements for J-series PIMs

On J-series Services Routers, the system monitors the PIMs and verifies that a newly inserted PIM falls within the power and heat dissipation capacity of the chassis. CLI commands allow you to choose which PIM to turn off if the power or heat dissipation capacity is exceeded.

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

Table 1 on page 8 shows the power consumption and heat dissipation, represented in non-dimensional tokens, assigned to each J-series PIM.

Table 1: J-series PIM Power Consumption and Heat Dissipation

Name	Model Number	PIM Abbreviation in JUNOS CLI	Tokens	
			Power	Heat
1-Port Gigabit Ethernet uPIM	JXU-SFP-S	1xSFP uPIM	8	8
6-Port Gigabit Ethernet uPIM	JXU-6GE-SFP-S	6xSFP uPIM	13	13
8-Port Gigabit Ethernet uPIM	JXU-8GE-TX-S	8xGE uPIM	21	27
16-Port Gigabit Ethernet uPIM	JXU-16GE-TX-S	16xGE uPIM	38	36
1-Port Copper Gigabit Ethernet ePIM	JXE-1GE-TX-S	1xGE Copper	6	7
1-Port SFP Gigabit Ethernet ePIM	JXE-1GE-SFP-S	1xGE SFP	4	4
Dual-Port Serial PIM	JX-2Serial-S	2xSerial	5	6
Dual-Port E1 PIM	JX-2E1-RJ48-S	2xE1	6	6
Dual-Port T1 PIM	JX-2T1-RJ48-S	2xT1	6	5
Dual-Port Channelized T1/E1/ISDN PRI PIM	JX-2CT1E1-RJ45-S	2xCT1E1 / PRI	6	5
E3 PIM (1 port)	JX-1E3-S	1xE3	7	7
T3 PIM (also known as DS3)	JX-1DS3-S	1xT3	7	7

Table 1: J-series PIM Power Consumption and Heat Dissipation *(continued)*

Name	Model Number	PIM Abbreviation in JUNOS CLI	Tokens	
			Power	Heat
Dual-Port Fast Ethernet PIM	JX-2FE-TX-S	2xFE	6	6
4-Port Fast Ethernet ePIM	JXE-4FE-TX-S	4xFE ePIM	9	9
4-Port ISDN BRI S/T PIM	JX-4BRI-S-S	4x BRI S/T	4	4
4-Port ISDN BRI U PIM	JX-4BRI-U-S	4x BRI U	4	6
ADSL 2/2 + Annex A PIM (1 port, for POTS)	JX-1ADSL-A-S	1x ADSL Annex A	16	16
ADSL 2/2 + Annex B PIM (1 port, for ISDN)	JX-1ADSL-B-S	1x ADSL Annex B	16	16
G.SHDSL PIM (2-port two-wire mode or 1-port four-wire mode)	JX-2SHDSL-S	2x SHDSL (ATM)	9	10
TGM550 Telephony Gateway Module	Avaya	1x TGM550	14	19
TIM510 E1/T1 Telephony Interface Module	Avaya	1x DS1 TIM510	6	6
TIM514 Analog Telephony Interface Module	Avaya	4x FXS, 4xFXO TIM514	4	13
TIM521 BRI Telephony Interface Module	Avaya	4x BRI TIM521	3	3

For more information, 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 2 on page 10 lists USB and compact flash storage devices supported for use with the J-series routers.

Table 2: 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 3 on page 10 lists the compact flash and DRAM requirements for all J-series Services Routers.

Table 3: 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

Table 3: J-series Compact Flash and DRAM Requirements *(continued)*

Model	Minimum Compact Flash Required	Minimum DRAM Required	Maximum DRAM Supported
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

NOTE: If your J2300 Services Router contains a 128-MB compact flash, we recommend you upgrade it to at least 256 MB.

J-series Upgrade and Downgrade Instructions

This section contains the following topics:

NOTE: If the router is running a software version previous to 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 8.4R4.

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 compact flash.

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-cf*nnn*.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.
- cf*nnn* indicates the size of the target compact flash 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 compact flash disk, 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
```

Before installing the software upgrade, issue the following command, which frees storage by rotating noncurrent log files in /var/log , deleting files in /var/tmp that have not been modified in two days, and deleting all crash files in /var/crash:

```
user@host> request system storage cleanup
```

Before deleting the files, you can view the files to be deleted by issuing the following command:

```
user@host> request system storage cleanup dry-run
```

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/
   - https://www.juniper.net/support/csc/swdist-ww/
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 11.
4. Download the software to a local host or to an internal software distribution site.

NOTE: For downloads to J-series Services Routers with 256 MB of flash memory, see the *J-series Services Router Release Notes* for special instructions and ensure that you download the package to your router's /var/tmp/upgrade directory.

Installing Software Upgrades with the CLI

To install software upgrades on a router with the CLI:

1. Download the software package as described in "Downloading Software Upgrades from Juniper Networks" on page 13.
2. Copy the software package to the router. We recommend that you copy it to the /var/tmp directory.
3. Install the new package on the Internet Router:

   user@host> **request system software add no-validate unlink reboot** *source*

   Replace *source* with one of the following paths:

   - For a software package that is installed from a local directory on the router—*/pathname/package-name*
   - For software packages that are downloaded and installed from a remote location:
     - ftp://*hostname/pathname/package-name*
     - http://*hostname/pathname/package-name*

   The no-validate option bypasses the validation of the software package against the current configuration as a prerequisite to adding the software package.

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

   Adding the reboot command reboots the router after the upgrade is validated and installed. Rebooting takes place only if the upgrade is successful.

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

Downgrade Instructions

This section contains the following topics:

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.

Related Juniper Networks Documentation

Table 4 on page 16 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 4: Juniper Networks Technical Documentation

Title	Description
J-series Guides	
Getting Started Guide	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.
J-series Services Router Basic LAN and WAN Access Configuration Guide	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.
J-series Services Router Advanced WAN Access Configuration Guide	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.
J-series Services Router Administration Guide	Shows how to manage users and operations, monitor network performance, upgrade software, and diagnose common problems on J-series Services Routers.
JUNOS Configuration Guides	
JUNOS Class of Service Configuration Guide	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.
JUNOS CLI User Guide	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 *JUNOS System Basics Configuration Guide*.
JUNOS Feature Guide	Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.
JUNOS High Availability Configuration Guide	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).
JUNOS MPLS Applications Configuration Guide	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
JUNOS Multicast Protocols Configuration Guide	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
JUNOS Network Interfaces Configuration Guide	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.
JUNOS Network Management Configuration Guide	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP and accounting options.
Secure Configuration Guide for Common Criteria and JUNOS-FIPS	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.

Table 4: Juniper Networks Technical Documentation *(continued)*

Title	Description
JUNOS Software Installation and Upgrade Guide	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 *JUNOS System Basics Configuration Guide*.
JUNOS Policy Framework Configuration Guide	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, forwarding options, and cflowd.
JUNOS Routing Protocols Configuration Guide	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.
JUNOS Services Interfaces Configuration Guide	Provides an overview of the services interfaces functions of the JUNOS software and describes how to configure the services interfaces on the router.
JUNOS System Basics Configuration Guide	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.
JUNOS VPNs Configuration Guide	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	
JUNOS Hierarchy and RFC Reference	Describes the JUNOS *configuration mode* 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 *JUNOS System Basics Configuration Guide*.
JUNOS System Basics and Services Command Reference	Describes the JUNOS software *operational mode* 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.
JUNOS Interfaces Command Reference	Describes the JUNOS software *operational mode*commands you use to monitor and troubleshoot interfaces.
JUNOS Routing Protocols and Policies Command Reference	Describes the JUNOS software *operational mode* commands you use to monitor and troubleshoot routing policies and protocols, including firewall filters.
JUNOS System Log Messages Reference	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	
JUNOScript API Guide	Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routers.
JUNOS XML API Configuration Reference	Provides reference pages for the configuration tags in the JUNOScript API.
JUNOS XML API Operational Reference	Provides reference pages for the operational tags in the JUNOScript API.

Table 4: Juniper Networks Technical Documentation *(continued)*

Title	Description
JUNOS Configuration and Diagnostic Automation Guide	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	
JUNOScope Software User Guide	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	
J-series Services Router Release Notes	Summarize new features, identify hardware problems, provide information omitted from the manual, and contain upgrade and downgrade instructions.
JUNOS Release Notes	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.
JUNOScope Release Notes	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 http://www.juniper.net/techpubs/docbug/docbugreport.html. 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.

Self-Help Online Tools and Resources

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

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

Opening a Case with JTAC

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

- Use the Case Manager 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. 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 http://www.juniper.net/techpubs/docbug/docbugreport.html.

Revision History

June 2008—Revision 4, JUNOS Release 8.4R4

23 January 2008—Revision 3, JUNOS Release 8.4R3

24 September 2007—Revision 2, JUNOS Release 8.4R2

9 August 2007—Revision 1, JUNOS Release 8.4R1