J-series Services Router Release Notes for JUNOS 8.5R3

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These release notes introduce the newest release of Juniper Networks J-series Services Routers and Release 8.5R3 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 8.5R3 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*

Platform and Infrastructure

- **Support for bidirectional NAT**—You can now specify the Network Address Translation (NAT) type for a particular term in a NAT rule as either traditional (symmetric) NAT or full-cone NAT, in which all requests from the same internal IP address are mapped to the same external IP address. Port mapping is also supported, but not required. To configure this feature, include the nat-type statement at the [edit services nat rule *rule-name* term *term-name*] hierarchy level. By default, symmetric NAT is supported.

Interfaces and Chassis

- **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 line ports as analog DID trunk ports.
- **USB modem support for WAN backup**—A USB modem interface can now back up a primary Internet connection. You can configure J-series Services Routers to *fail over* to a USB modem connection when the primary connection experiences interruptions in Internet connectivity. The USB modem interface supports all features that WAN interfaces support. For example:
  - Class of service (CoS)
  - Services such as Network Address Translation (NAT), stateful firewall filters, and Generic Routing Encapsulation (GRE) tunneling
  - Packet capture (PCAP), sampling, and tcpdump
  - Interface statistics

To specify whether dial-in calls are for management console access or routable calls, include the dialin (console | routable) statement at the [edit interfaces umd0 modem-options] hierarchy level.

- **Routing policy for source-class and destination-class usage**—You can now configure routing policy for source-class usage (SCU) and destination-class usage (DCU) on J-series Services Routers. SCU counts packets sent to customers by performing lookup on the IP source address. DCU counts packets from customers by performing lookup on the IP destination address. Configure the routing policy at the [edit policy-options policy-statement *statement-name*] hierarchy level. Enable packet counting on an interface at the [edit interfaces *interface-name* unit *unit-number* family *family-name* accounting] hierarchy level.

Changes in Default Behavior

- To enable BGP route reflectors, J-Flow traffic analysis, and data link switching (DLSw) on a J-series Services Router, you must purchase and install separate software licenses. From JUNOS Release 8.5 onwards, if you have not installed a valid license, the BGP router reflectors and J-Flow traffic analysis features do not function. If these features are added to the configuration and committed, the configuration will be updated and a license warning message will be displayed. [Getting Started Guide for your router]
- Pings between customer edge (CE) routers might fail because all J-series routers now have enforced hard licensing. [*J-series Services Router Administration Guide*]
- On 4-port Fast Ethernet ePIMs installed in J4350 and J6350 Services Routers, you can configure a maximum transmission unit (MTU) size of only 1518 bytes even though the CLI indicates that you can configure an MTU of up to 9192 bytes. If you configure an MTU greater than 1518 bytes, the router does not accept the configuration and generates a system log error message similar to the following: "/kernel: fe-3/0/1: Illegal media change. MTU invalid: 9192. Max MTU supported on this PIM: 1518." [*J-series Services Router Basic LAN and WAN Access Configuration Guide*; *JUNOS Interfaces Command Reference*]
- 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 indicates the slot that is unusable. [Getting Started Guide for your router;*JUNOS System Basics and Services Command Reference*]
- The output of the show chassis fpc and show chassis hardware commands has been modified to indicate when an interface type is not supported for a particular software release or in a particular PIM slot on J-series Services Routers. [Getting Started Guide for your router;*J-series Services Router Basic LAN and WAN Access Configuration Guide*]
- On a J-series Services Router, link fragmentation and interleaving (LFI) and Multilink Point-to-Point Protocol (MLPPP) support has been extended to serial interfaces. This support on serial interfaces is the same as the existing LFI and

MLPPP support on T1 and E1 interfaces. [*J-series Services Router Basic LAN and WAN Access Configuration Guide*]

- When you configure a serial interface in loop-timed DTE mode, the Clock rate field is no longer displayed in the output of the show interfaces command. [*JUNOS Interfaces Command Reference*]
- For 6-Port SFP Gigabit Ethernet uPIMs on J-series Services Routers, the show chassis hardware command output now displays information about small form-factor pluggable transceivers (SFPs). [Getting Started Guide for your router;*J-series Services Router Basic LAN and WAN Access Configuration Guide*;*JUNOS System Basics and Services Command Reference*]
- The MTU has been reduced from 9192 to 9150 bytes on the following J-series interfaces: ADSL PIM interfaces, G.SHDSL PIM interfaces, built-in serial interfaces, and Dual-Port Serial PIM interfaces. [*J-series Services Router Basic LAN and WAN Access Configuration Guide*]
- A new DHCP server option has been added to J-series Service Routers. The option allows you to specify the next server used for DHCP communication after a boot client establishes initial contact. Use of this feature inserts an IP address into the siaddr field of a DHCP protocol packet. To specify the next DHCP server, include the next-server statement at the [edit system services dhcp], [edit system services dhcp pool*pool id*], or [edit system services dhcp static-binding *mac-address*] hierarchy level. [*J-series Services Router Administration Guide*]
- Automatic reenrollment support has been added for IPSec digital certificates before expiration. You can configure the percentage of the validity end time (specified in the certificate) when automatic reenrollment is initiated. This feature is not enabled by default. To enable the feature on the router, include the auto-re-enrollment statement at the [edit security pki] hierarchy level. [*J-series Services Router Advanced WAN Access Configuration Guide*; *JUNOS Feature Guide*]

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 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

- 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]
- 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]
- 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]
- On J-series Services Routers, if you oversubscribe an E1 interface, latency on the high-priority queue might be higher than expected. As a workaround, configure a shaping rate on the E1 interface that is equal to the line rate minus the E1 framing overhead. [PR/60595]
- 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 serial interfaces transmitting either 64-byte or 128-byte packets, the effective bandwidth falls when the interface is highly over-subscribed. [PR/235753]

Resolved Issues

The following issues have been resolved since JUNOS Release 8.5R2:

- When an ISDN interface is taken offline, the LEDs on the ISDN PIM might not turn off. [PR/59536: This issue has been resolved.]
- On J-series Services Routers, if you have configured an IPSec-over-GRE tunnel, there might be fragmentation issues. [PR/74377: This issue has been resolved.]
- 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 be initialized or might have clocking problems. [PR/102638: This issue has been resolved.]
- On a J-series router with a Dual-Port Channelized T1/E1/ISDN PRI PIM installed, the channelized interfaces are configured to share ISDN PRI B-channel bc-pim/0/port time slots with DS0 ds-pim/0/port time slots and the B-channels used for dialout to back up the DS0 channels if they are unavailable. When the primary ds-pim/0/port:channel are available again, dialout on the backup B-channel might not be terminated. [PR/266900: This issue has been resolved]
- Routing Engine software downgrade using jinstall does not repartition the hard disk, which results in an unsuccessful snapshot. [PR/279358: This issue has been resolved]

Errata

- To enable BGP route reflectors, J-Flow traffic analysis, and data link switching (DLSw) on a J-series Services Router, you must purchase and install separate software licenses. From JUNOS Release 8.5 onwards, if you have not installed a valid license, the BGP router reflectors and J-Flow traffic analysis features do not function. If these features are added to the configuration and committed, the configuration will be updated and a license warning message will be displayed. [*J2320, J2350, J4350, and J6350 Services Router Getting Started Guide*]
- 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*]
- The values in the following two tables are corrections to the PIM power consumption, heat dissipation, and heat capacity information presented in the documentation.

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

Name	Model Number	PIM Abbreviation in JUNOS CLI	Tokens		
			Low Power	High Power	Heat
TIM510 E1/T1 Telephony Interface Module	Avaya	1x DS1 TIM510	6	–	5
TIM521 BRI Telephony Interface Module	Avaya	4x BRI TIM521	2	–	2

Table 2: Maximum Power and Heat Capacities of J-series Models

Model	Low- Power Capacity (tokens)	High- Power Capacity (tokens)	Heat Capacity (tokens)
J2320	50	50	68
J2350	84	84	84

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

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 3 on page 9 lists USB and compact flash storage devices supported for use with the J-series routers.

Table 3: 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

Table 3: Supported Storage Devices on the J-series Services Routers *(continued)*

Manufacturer	Storage Capacity	Third-Party Part Number
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 4 on page 10 lists the compact flash and DRAM requirements for all J-series Services Routers.

Table 4: 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	1 GB
J2350	256 MB	256 MB	1 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 compact flash disk, 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 compact flash:
  - 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 Compact Flash" on page 18.

- 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

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
```

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 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 a 256-MB compact flash, see "Special Instructions for J-series Routers with a 256-MB Compact Flash" on page 18.

Installing Software Upgrades with the J-Web Interface

If your router has at least a 512-MB compact flash, 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

If your router has at least a 512-MB compact flash, 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 13.
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 5 on page 14.
4. Click **Fetch and Install Package**. The software is activated after the router has rebooted.

Table 5: 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 compact flash, 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 13.
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 6 on page 14.
4. Click **Upload Package**. The software is activated after the router has rebooted.

Table 6: 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.

Table 6: Upload Package Summary *(continued)*

Field	Function	Your Action
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 compact flash, see "Special Instructions for J-series Routers with a 256-MB Compact Flash" on page 18.

This section contains the following topics:

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.

   If you had configured the unused swap partition using the upgrade-helper script (as described in "Configuring the Unused Swap Partition" on page 21), make sure to copy the software package to the /var/tmp/upgrade 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 compact flash 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:

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 Compact Flash

J-series Services Routers with a 256-MB compact flash might need more flash memory space for an upgrade.

To provide enough space for an upgrade:

- Clean up files on the router (see "Cleaning Up Files" on page 18).
- Verify the available compact flash space (see "Verifying Available Compact Flash Space" on page 19).
- If required, increase the compact flash space, (see "Increasing the Compact Flash Space" on page 20).

Cleaning Up Files

To clean up files, you use CLI commands to delete the backup software image, rotate log files, and remove other unnecessary files.

When you upgrade software on the router, it creates a backup image of the software that was previously installed. To create enough space on a 256-MB compact flash for an upgrade, use the request system software delete backup command to delete this image. In addition, use the request system storage cleanup command to rotate log files and delete unnecessary files.

NOTE: To review the list of files that can be deleted without actually deleting files, you can use the request system storage cleanup dry-run command.

To delete the backup software image, rotate log files, and delete unneeded files:

1. From operational mode in the CLI, enter the following command:

   user@host> **request system software delete backup**

2. Enter yes when prompted:

   Delete backup system software package [yes,no] (no) **yes**

3. Enter the following command:

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

The router rotates log files and displays the files that you can delete.

4. Enter yes at the prompt to delete the files.
5. Delete any files that you created by entering the following command:

   user@host> **file delete** *filename*

   Replace *filename* with the name of the file or directory to delete.
6. Verify that you have enough space on the compact flash to successfully upgrade (see "Verifying Available Compact Flash Space" on page 19).

Verifying Available Compact Flash Space

Before you start the upgrade, verify that you have enough space on the compact flash to successfully upgrade.

To see how much space is available on the compact flash, use the CLI operational mode command show system storage:

```
user@host show system storage
Filesystem             Size       Used      Avail  Capacity   Mounted on
/dev/ad0s1a            213M       119M        92M       57%  /
devfs                  1.0K       1.0K         0B      100%  /dev
devfs                  1.0K       1.0K         0B      100%  /dev/
/dev/md0               155M       155M         0B      100%  /junos
/cf                    213M       119M        92M       57%  /junos/cf
devfs                  1.0K       1.0K         0B      100%  /junos/dev/
procfs                 4.0K       4.0K         0B      100%  /proc
/dev/bo0s1e             24M        16K        24M        0%  /config
/dev/md1               168M       7.2M       147M        5%  /mfs
/dev/md2                58M        42K        53M        0%  /jail/tmp
/dev/md3               7.7M       100K       7.0M        1%  /jail/var/etc
devfs                  1.0K       1.0K         0B      100%  /jail/dev
/dev/md4               1.9M       6.0K       1.7M        0%  /jail/html/oem
```

The show system storage command output displays information about the root file system on the compact flash on the line that contains only a forward slash (/) in the Mounted on column. In this example, the compact flash has 92 MB of available space.

If the show system storage command output displays:

- Available compact flash space—135 MB or more. See "Installing Software Upgrades with the CLI" on page 15 to proceed with the upgrade.
- Available compact flash space—less than 135 MB. See "Increasing the Compact Flash Space" on page 20 to increase the compact flash space.

Increasing the Compact Flash Space

NOTE: On J-series Services Routers running JUNOS Release 8.2 or later, you can no longer specify the internal compact flash as the medium used to store system software failure memory snapshots when using the set system dump-device CLI command. For J4350 or J6350 Services Routers, you need to specify a USB storage device (usb option) as the medium. For J2320 and J2350 Services Routers, you can specify a USB storage device (usb option) or the external compact flash (removable-compact-flash option) as the medium.

To increase the compact flash space:

- If you have physical access to the router, remove the swap partition (see "Removing the Swap Partition" on page 20).
- If you do not have physical access to the router, download the upgrade-helper script to configure the unused swap partition (see "Configuring the Unused Swap Partition" on page 21).

Removing the Swap Partition

To remove the swap partition:

1. Insert a Juniper Networks-supported 256-MB USB storage device into an available USB port of the Services Router to be upgraded. For a list of supported storage devices, see "Supported Third-Party Hardware" on page 9.
2. From operational mode in the CLI, enter the following command:

   user@host> **request system snapshot as-primary partition swap-size 0 media usb**

3. Enter the following command:

   user@host> **request system reboot media usb**

   This command reboots the router and boots from the USB storage device with the original configuration file intact. After rebooting, the router is online and uses the configuration file as the running configuration.
4. Enter the following command:

   user@host> **request system snapshot as-primary partition swap-size 0 media compact-flash**

   This command repartitions the internal compact flash so that it has no swap partition.
5. Enter the following command:

   user@host> **request system reboot media compact-flash**

This command reboots the router from the internal compact flash. After rebooting, the router is online with your running configuration, but the swap partition on the compact flash is removed.

6. Remove the USB storage device.
7. See "Installing Software Upgrades with the CLI" on page 15 to proceed with the upgrade.

Configuring the Unused Swap Partition

To configure the unused swap partition:

1. In your Web browser, type the following URL. When prompted, use the username and password supplied to you by Juniper Networks representatives to download the upgrade-helper script to your local server.

   https://download.juniper.net/software/junos/specials/upgrade-helper.gz

2. Start a UNIX-level shell and log in as a root user.
3. Enter the CLI and from the operational mode copy the upgrade-helper script to the root directory on your router:

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

   Replace *source* with the path to the script on your local server.

   Replace *destination* with the destination directory: /root.

4. Exit the CLI environment and create a UNIX-level shell:

   user@host> **start shell**

5. Use the compression utility gunzip to decompress the downloaded script. The gunzip utility is available on your router in the /usr/bin/gunzip directory.
6. Execute the script:

   ```
   root@host% sh ./upgrade-helper
   Upgrade helper script started
   ATTENTION: PLEASE RUN THIS SCRIPT AGAIN IMMEDIATELY AFTER REBOOTING.
   Rebooting system.
   ```

   The system reboots (in no more than 10 seconds) without a swap partition.

7. Execute the upgrade-helper script again immediately after rebooting.
8. See "Installing Software Upgrades by Downloading Files" on page 15 to proceed with the upgrade.

Related Juniper Networks Documentation

Table 7 on page 22 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 7: 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 Access Privilege Guide	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.
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 Multiplay Solutions Configuration Guide	Describes how you can deploy IPTV and voice over IP (VoIP) services in your network.
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.

Table 7: Juniper Networks Technical Documentation *(continued)*

Title	Description
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.
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.

Table 7: Juniper Networks Technical Documentation *(continued)*

Title	Description
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.
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

April 2008—Revision 3, JUNOS Release 8.5R3

February 2008—Revision 2, JUNOS Release 8.5R2

15 November 2007—Revision 1, JUNOS Release 8.5R1