

Routing Matrix Upgrade Kit Installation Instructions for T640 Internet Routing Node

3 December 2004
Part No: 530-011965-01
Revision 2

This document describes how to convert an offline T640 Internet routing node before integrating it with the TX Matrix platform. (To convert an operational T640 routing node, see the *TX Matrix Platform Hardware Guide*.)

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T640 Routing Node Conversion Overview

If your T640 routing node is not shipped from Juniper Networks with the hardware and software components required to connect it to a TX Matrix platform, you must convert the routing node by performing the following tasks:

- Upgrade the software to JUNOS Release 7.0 or later.
- Upgrade the firmware on the FPCs.
- Replace the standard rear fan tray with a different model required to cool the chassis.
- Replace the standard CBs with T-CBs.
- Replace the standard SIBs with T640-SIBs.

Tools and Parts Required

- Phillips (+) screwdriver, number 2
- Electrostatic discharge (ESD) grounding wrist strap
- Electrostatic bag or antistatic mat

Converting an Offline T640 Routing Node

To convert an offline T640 routing node before integrating it with the TX Matrix platform, follow these procedures:

- Upgrading the JUNOS Software on page 2
- Upgrading the FPC Firmware on page 3
- Merging the T640 Routing Node Configuration into the TX Matrix Platform Configuration on page 3
- Replacing the Rear Fan Tray on page 5
- Replacing the Standard CBs with T-CBs on page 7
- Replacing the Standard SIBs with T640-SIBs on page 10

Upgrading the JUNOS Software

If the version of the JUNOS software running on the T640 routing node is earlier than Release 7.0, you must upgrade the software before connecting it to the TX Matrix platform. For information about installing and upgrading JUNOS software, see the *JUNOS System Basics Configuration Guide*.



NOTE: We recommend you run the same JUNOS software release on the master and backup Routing Engines. If you elect to run different JUNOS software releases on the Routing Engines, a change in Routing Engine mastership can cause one or all T640 routing nodes to be logically disconnected from the TX Matrix platform. For more information, see the *TX Matrix Platform Hardware Guide*.

Upgrading the FPC Firmware

Before integrating the T640 routing node with the TX Matrix platform, you might have to upgrade the firmware on one or more FPCs in the T640 routing node. To upgrade the firmware, you must contact your customer support representative.

To determine if you need to upgrade the FPC firmware, display the version of the firmware on all FPCs by issuing the `show system firmware` command:

```
user@host> show system firmware
```

Part	Type	Tag	Current version	Available version	Status
FPC 0	ROM Monitor	0 0	6.4.18		OK
PIC 0	ATM 1/0 FLASH	0	??		OK
PIC 0	ATM 1/0 FLASH	1	??		OK
PIC 1	DCHIP 1/1	0	5		OK
PIC 2	DCHIP 1/2	0	5		OK
PIC 3	QGE 1/3	1	4		OK
...					

If the Current version field is not 6.4.18 or later for any FPC, you must upgrade the firmware for that FPC.

Merging the T640 Routing Node Configuration into the TX Matrix Platform Configuration

Using the current T640 routing node configuration, create a configuration file on the T640 routing node that will be merged into the TX Matrix platform configuration:

1. Save the T640 routing node configuration. For example:

```
user@host# save t640-config.conf
```

2. As described in the *TX Matrix Platform Hardware Guide*, special configuration groups `re0` and `re1` apply to the Routing Engines in slots 0 and 1 of the TX Matrix platform. If the T640 routing node configuration contains these groups, you must change them to `lcc lcc-number-re0` and `lcc lcc-number-re1`, where `lcc-number` equals the chassis ID of the routing node.
3. If the configuration includes special Routing Engine configuration groups, include the `apply-groups` statement at the [edit] hierarchy level. For example:

```
apply-groups [ lcc0-re0 lcc0-re1 ]
```

4. Change the configuration hierarchy of all statements at the [edit chassis fpc slot-number] hierarchy level to the [edit chassis lcc lcc-number fpc slot-number] hierarchy level.
5. If the chassis ID of the T640 routing node is 0, you do not need to change interface names or the configuration hierarchy of any other statements. Otherwise, you must modify the FPC number throughout the configuration based on the chassis ID you select. For more information, see the *TX Matrix Platform Hardware Guide*.
6. Save the modified T640 routing node configuration using a different filename from the one you selected in Step 1. For example:

```
user@host# save tx-config.conf
```



NOTE: Do not commit the configuration.

7. Transfer the modified T640 routing node configuration to the TX Matrix platform. You can use an intermediate server on the out-of-band management network accessible by both the T640 routing node and the TX Matrix platform.
8. On an external management device connected to the console or auxiliary port of the TX-CIP, load the configuration saved in Step 6. Use the `merge` option as follows:

```
user@host# load merge tx-config.conf
```

9. Commit the configuration:

```
user@host# commit synchronize
```



NOTE: If you elect to run different JUNOS software releases on the Routing Engines, or if you want a different configuration on the backup Routing Engine, issue the `commit` command without the `synchronize` option. In either case, you must create a configuration for the backup Routing Engine. To do this, log in to the backup Routing Engine and follow the procedure in this section. The TX Matrix platform will copy this configuration to all the backup Routing Engines in the routing matrix after control is transferred to the TX Matrix platform.

This is an example of a modified T640 routing node configuration at the [group lcc0-re0] hierarchy level:

```
group lcc0-re0 {
```

```

system {
    host-name host-name;
    backup-router address destination destination-address;
}
interfaces {
    fxp0 {
        unit 0 {
            family inet {
                address address/prefix-length
            }
        }
    }
}
}

```

Replacing the Rear Fan Tray

To replace the rear fan tray, use the following procedures:

- Removing the Rear Fan Tray on page 5
- Installing a Rear Fan Tray on page 6

Removing the Rear Fan Tray

The rear fan tray is mounted vertically on the right side of the rear of the chassis. The fan tray weighs about 12 lb (5.4 kg).



CAUTION: To maintain proper cooling, do not operate the T640 routing node with the rear fan tray removed for more than one minute.

To remove the rear fan tray, follow this procedure (see Figure 1):

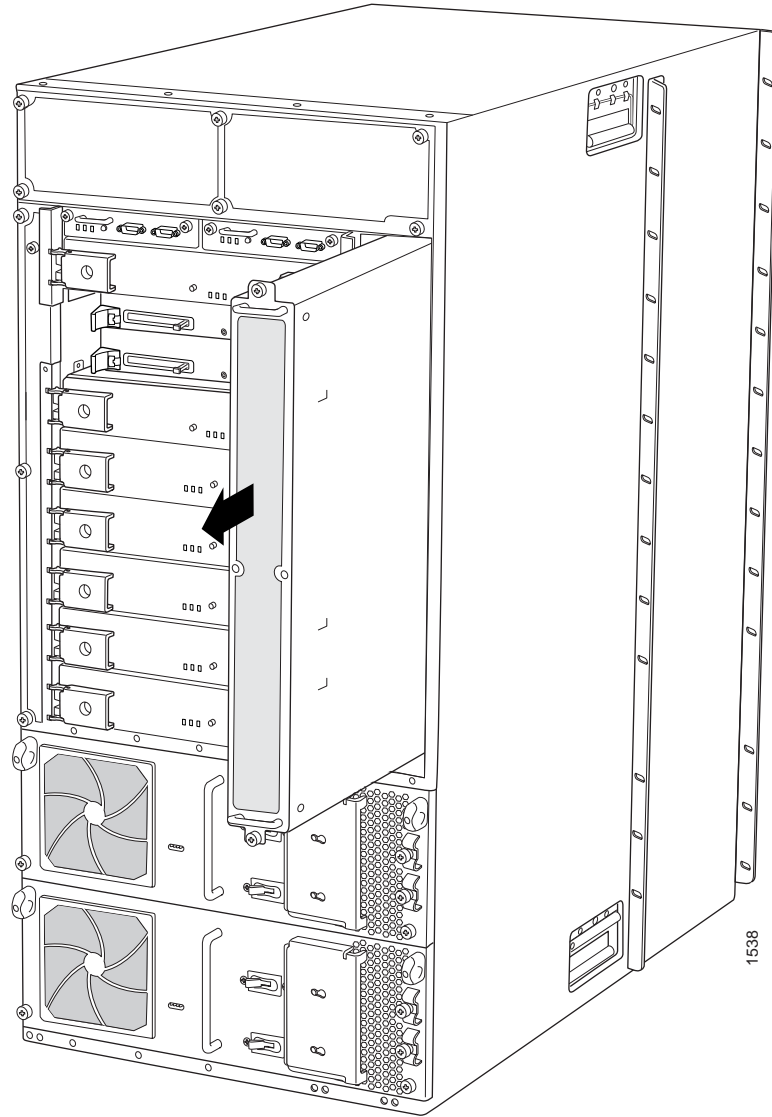
1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.
2. Loosen the captive screws on the top and bottom of the fan tray faceplate, using a Phillips (+) screwdriver, number 2.
3. Grasp the handles and pull the fan tray halfway out of the chassis.



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

4. When the fans stop spinning, grasp the handles and pull the fan tray completely out of the chassis.

Figure 1: Removing the Rear Fan Tray



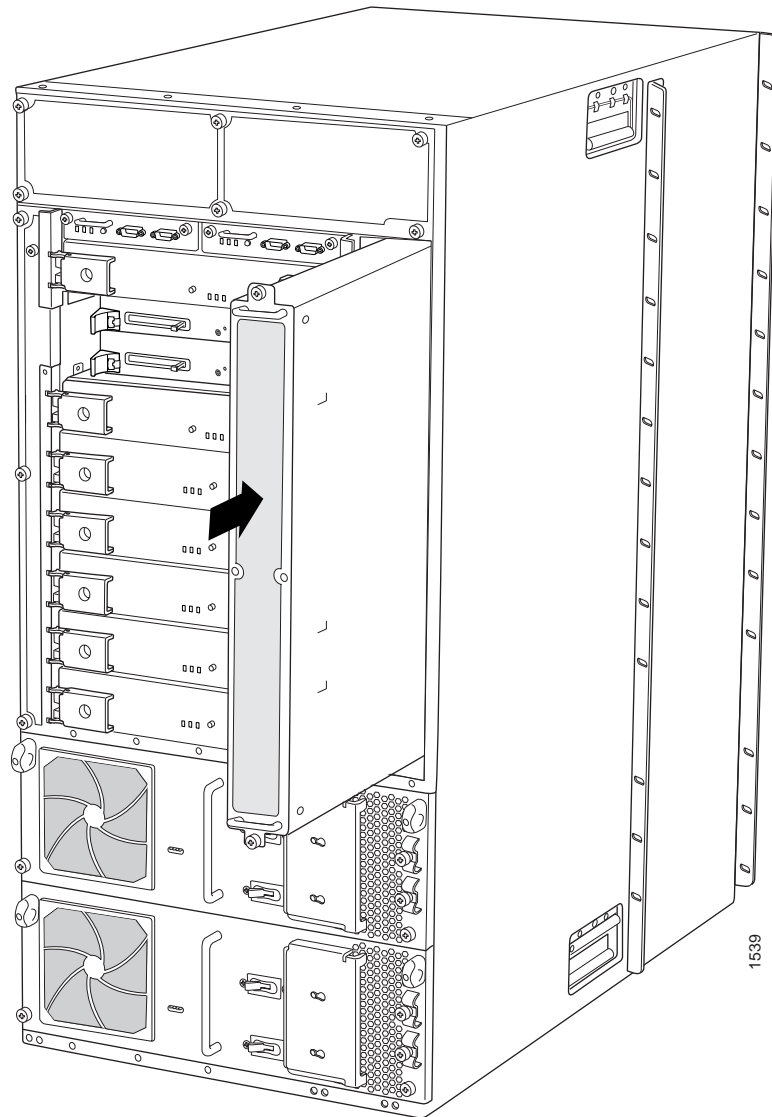
Installing a Rear Fan Tray

To install a replacement rear fan tray, follow this procedure (see Figure 2):

1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.

2. Grasp the fan tray by its handles and insert it straight into the chassis.
3. Tighten the captive screws on the fan tray faceplate to secure it in the chassis, using a Phillips (+) screwdriver, number 2.

Figure 2: Installing a Rear Fan Tray



Replacing the Standard CBs with T-CBs

To replace the standard CBs with T-CBs, follow these procedures:

- Removing the CBs on page 8

- Installing the T-CBs on page 9

Removing the CBs

To remove the CBs, follow this procedure for each CB (see Figure 3):

1. If the T640 routing node is powered on, issue the `request system halt both-routing-engines` operational mode command from the console or other management device connected to the T640 routing node. The command shuts down the Routing Engines cleanly, so their state information is preserved.

```
user@host> request system halt both-routing-engines
```

Wait until a message appears on the console confirming that the operating system has halted. For more information about the command, see the *JUNOS Protocols, Class of Service, and System Basics Command Reference*.

2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.
3. Switch both circuit breakers on each power supply faceplate to the off position (O).



NOTE: The CBs, T-CBs, SIBs, and T640-SIBs are hot-removable and hot-insertable. However, we recommend you power off the T640 routing node before you replace the CBs and SIBs.

4. Set the switches on each T-CB:
 - Set the chassis ID switch to a value from 0 through 3. You must use the same chassis ID on each T-CB.
 - Set the M/S switch on the T-CB faceplate to M.

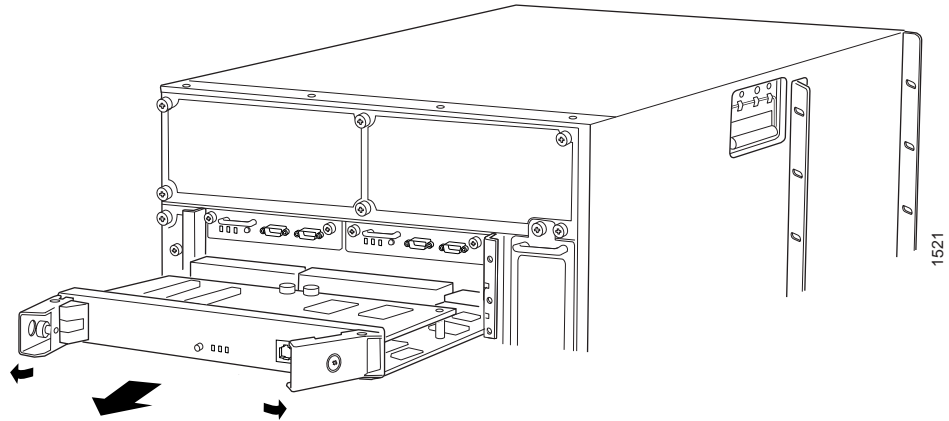


NOTE: If the routing matrix contains only one T640 routing node, we recommend you assign a chassis ID of 0 to the routing node.

5. Loosen the captive screws (using a Phillips (+) screwdriver, number 2) on the ejector handles on both sides of a CB faceplate.
6. Flip the ejector handles outward to unseat the CB.
7. Grasp the ejector handles and slide the CB about halfway out of the chassis.

8. Place one hand underneath the CB to support it and slide it completely out of the chassis.
9. Place the CB on an antistatic mat.

Figure 3: Removing a CB



Installing the T-CBs

To install the T-CBs, follow this procedure for each T-CB (see Figure 4):

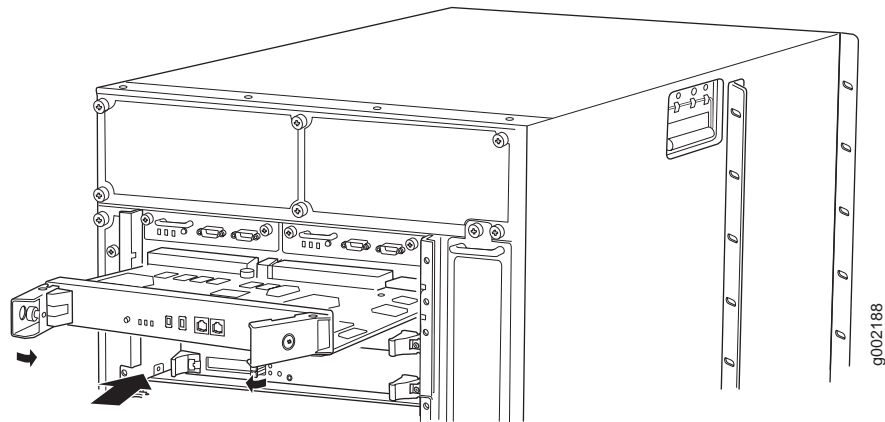
1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to an approved site ESD grounding point. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.
2. Ensure the ejector handles are not flush with the faceplate. If necessary, loosen the captive screws and flip the ejector handles outward.
3. Carefully align the sides of the T-CB with the guides inside the chassis.
4. Slide the T-CB into the chassis, carefully ensuring that it is correctly aligned.
5. Grasp both ejector handles and press them inward to seat the T-CB.



NOTE: Ensure the ejector handle tabs are properly mated inside their corresponding chassis slots before you tighten the captive screws on the ejector handles. You might have to close and open the handles a few times before the tabs catch the slots.

6. Tighten the captive screws on the ejector handles, using a Phillips (+) screwdriver, number 2.

Figure 4: Installing a T-CB



Replacing the Standard SIBs with T640-SIBs

To replace the standard SIBs with T640-SIBs, follow these procedures:

- Removing the SIBs on page 10
- Installing the T640-SIBs on page 11

Removing the SIBs

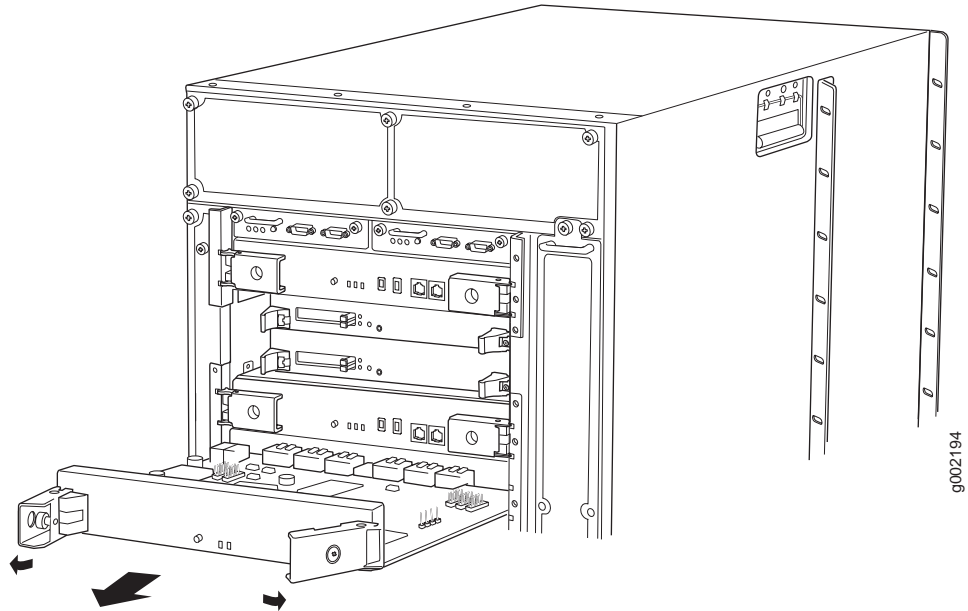
To remove the SIBs, follow this procedure for each SIB (see Figure 5):

1. Place an electrostatic bag or antistatic mat on a flat, stable surface.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.
3. Loosen the captive screws (using a Phillips (+) screwdriver, number 2) on the ejector handles on each side of the SIB faceplate.
4. Flip the ejector handles outward to unseat the SIB.
5. Grasp both ejector handles, pull firmly, and slide the SIB about three-quarters of the way out of the chassis.
6. Place one hand underneath the SIB to support it and slide it completely out of the chassis. Place it on the antistatic mat.



CAUTION: Do not stack hardware components on one another after you remove them. Place each component on an antistatic mat resting on a stable, flat surface.

Figure 5: Removing a SIB



Installing the T640-SIBs

To install the T640-SIBs, follow this procedure for each T640-SIB (see Figure 6):

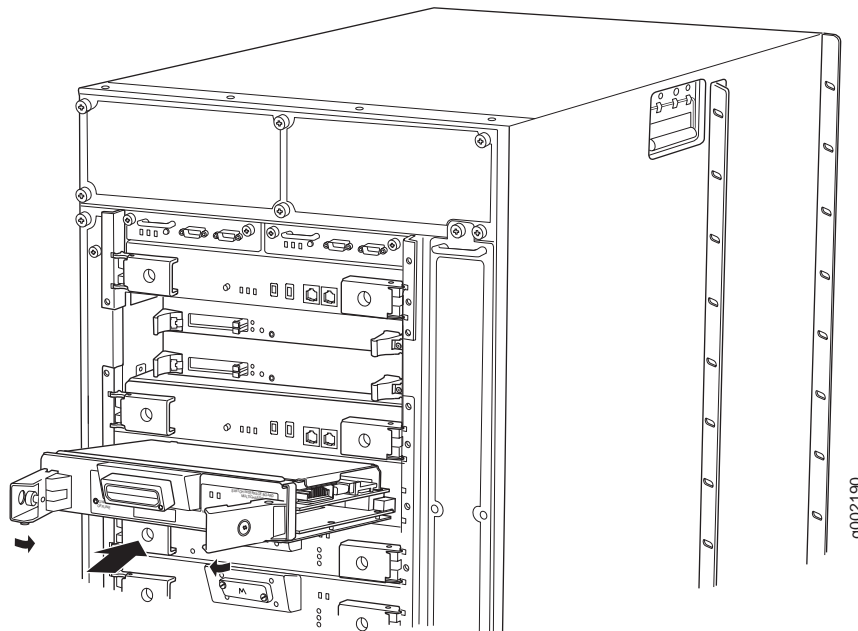
1. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. For more information about ESD, see the *TX Matrix Platform Hardware Guide*.
2. Ensure the ejector handles are not flush with the faceplate. If necessary, loosen the captive screws and flip the ejector handles outward.
3. Place one hand underneath the T640-SIB to support it. With the other hand, hold one of the ejector handles on the T640-SIB faceplate.
4. Carefully align the sides of the T640-SIB with the guides inside the chassis.
5. Slide the T640-SIB into the chassis, carefully ensuring that it is correctly aligned.
6. Grasp both ejector handles and press them inward to seat the T640-SIB.



NOTE: Ensure the ejector handle tabs are properly mated inside their corresponding chassis slots before you tighten the captive screws on the ejector handles. You might have to close and open the handles a few times before the tabs catch the slots.

7. Tighten the captive screws on the ejector handles, using a Phillips (+) screwdriver, number 2.

Figure 6: Installing a T640-SIB



Connecting and Powering On the T640 Routing Node

After you have converted the T640 routing node, you connect it to the TX Matrix platform and power it on as described in the *TX Matrix Platform Hardware Guide*.

List of Technical Publications

Table 1 lists the software and hardware guides and release notes for Juniper Networks routing platforms that use the JUNOS Internet software and describes the contents of each book.

Table 1: Juniper Networks Technical Documentation

Book	Description
JUNOS for J-series, M-series, and T-series Routing Platforms Configuration Guides	
<i>Feature Guide</i>	Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.

Book	Description
<i>System Basics</i>	Provides an overview of the JUNOS software and describes how to install and upgrade the software. This manual also describes how to configure system management functions and how to configure the chassis, including user accounts, passwords, and redundancy.
<i>Network Interfaces and Class of Service</i>	Provides an overview of the network interface and class-of-service functions of the JUNOS software and describes how to configure the network interfaces on the router.
<i>MPLS Applications</i>	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
<i>Multicast Protocols</i>	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
<i>Network Management</i>	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP, accounting options, and cflowd.
<i>Policy Framework</i>	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, and forwarding options.
<i>Routing Protocols</i>	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.
<i>Services Interfaces</i>	Provides an overview of the services interfaces functions of the JUNOS software and describes how to configure the services interfaces on the router.
<i>VPNs</i>	Provides an overview and describes how to configure Layer 2 and Layer 3 virtual private networks (VPNs), virtual private LAN service (VPLS), and Layer 2 circuits. Provides configuration examples.
JUNOS References	
<i>Network and Services Interfaces Command Reference</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot network and services interfaces on Juniper Networks routing platforms.
<i>Protocols, Class of Service, and System Basics Command Reference</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot most aspects of Juniper Networks routing platforms.
<i>System Log Messages Reference</i>	Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message.
JUNOScript API Documentation	
<i>JUNOScript API Guide</i>	Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routers.
<i>JUNOScript API Configuration Reference</i>	Provides reference pages for the configuration tags in the JUNOScript API.
<i>JUNOScript API Operational Reference</i>	Provides reference pages for the operational tags in the JUNOScript API.
JUNOS Comprehensive Index and Glossary	
<i>Comprehensive Index and Glossary</i>	Provides a complete index of all JUNOS Internet software books and the <i>JUNOScript API Guide</i> . Also provides a comprehensive glossary.
Hardware Documentation	

Book	Description
<i>Hardware Guide</i>	Describes how to install, maintain, and troubleshoot routers and router components. Each platform has its own hardware guide.
<i>PIC Guide</i>	Describes the router Physical Interface Cards (PICs). Each router platform has its own PIC guide.
JUNOScope Documentation	
<i>JUNOScope Software User Guide</i>	Describes the JUNOScope software graphical user interface (GUI), how to install and administer the software, and how to use the software to manage router configuration files and monitor router operations.
J-series Services Router Documentation	
<i>J-series Services Router User Guide</i>	Contains instructions for installing, configuring, and managing a J-series Services Router. The guide explains how to prepare your site for installation, unpack and install the hardware, power on the router, configure secure routing, monitor network operations, and perform routine maintenance.
Release Notes	
<i>JUNOS Internet Software Release Notes</i>	Provide a summary of new features for a particular software release. Software release notes also contain corrections and updates to published JUNOS and JUNOScript manuals, provide information that might have been omitted from the manuals, and describe upgrade and downgrade procedures.
<i>Hardware Release Notes</i>	Describe the available documentation for the router platform and summarize known problems with the hardware and accompanying software. Each platform has its own release notes.
<i>JUNOScope Software Release Notes</i>	Contain corrections and updates to the published JUNOScope manual, provide information that might have been omitted from the manual, and describe upgrade and downgrade procedures.
<i>J-series Services Router Release Notes</i>	Briefly describe Services Router features, identify known hardware problems, and provide upgrade and downgrade instructions

Requesting Support

For technical support, open a support case using the Case Manager link at <http://www.juniper.net/support/> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (outside the United States).

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

3 December 2004—Revision 2. Updated support section and made general updates to procedures.

12 November 2004—Revision 1.

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