

# About This Guide

This preface provides the following guidelines for using the *JUNOS Internet Software for J-series, M-series, and T-series Routing Platforms MPLS Network Operations Guide* and related Juniper Networks, Inc., technical documents:

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## Objectives

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This manual provides operational information helpful in monitoring router components and isolating potential problems. This manual is not directly related to any particular release of the JUNOS Internet software.

To obtain the most current version of this manual, refer to the product documentation page on the Juniper Networks Web site, which is located at <http://www.juniper.net/>.

## Audience

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This guide is designed for network administrators who are configuring and monitoring a Juniper Networks M-series or T-series routing platform in an MPLS network environment.

To use this guide, you need a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. You must also be familiar with one or more of the following Internet routing protocols:

- Border Gateway Protocol (BGP)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Intermediate System-to-Intermediate System (IS-IS)
- Internet Control Message Protocol (ICMP) router discovery
- Internet Group Management Protocol (IGMP)
- Multiprotocol Label Switching (MPLS)
- Open Shortest Path First (OSPF)
- Protocol-Independent Multicast (PIM)
- Resource Reservation Protocol (RSVP)
- Routing Information Protocol (RIP)
- Simple Network Management Protocol (SNMP)

Personnel operating the equipment must be trained and competent; must not conduct themselves in a careless, willfully negligent, or hostile manner; and must abide by the instructions provided by the documentation.

## Chapter Organization

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Most chapters in this manual consist of a checklist at the beginning of the chapter listing the tasks and commands for monitoring the interface. The tasks and commands are then explained in step-by-step procedures.

Each step-by-step procedure consists of some or all of the following parts:

- Purpose—Describes what is affected if this task is not performed or what is accomplished with this task.
- What Is... —Describes a component (usually hardware).
- Step(s) To Take—Lists the steps in the task.
- Action—Describes an action to perform in order to complete the step.
- Sample Output—Presents sample output relevant to the procedure.

- What It Means—Describes or summarizes what is presented in the sample output.
- Symptom/Indications—Describes a problem with the software or hardware.
- See Also—Lists other topics related to this task.
- Alternative Actions—Describes other commands or ways of doing the task.
- Syntax—Describes the full syntax of the command or configuration statement. For an explanation of how to read the syntax statements, see “Documentation Conventions” on page xv.

## Using the Examples in This Manual

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If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

### Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```

system {
  scripts {
    commit {
      file ex-script.xsl;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}

```

2. Merge the contents of the file into your routing platform configuration by issuing the `load merge` configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

## Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file `ex-script-snippet.conf`. Copy the `ex-script-snippet.conf` file to the `/var/tmp` directory on your routing platform.

```
commit {
    file ex-script-snippet.xml;
}
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the `load merge relative` configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the `load` command, see the *JUNOS CLI User Guide*.

## Documentation Conventions

Table 1 defines notice icons used in this guide.

**Table 1: Notice Icons**



| Icon  | Meaning            | Description   |
|---|--------------------|---|
|  | Informational note | Indicates important features or instructions.                               |
|  | Caution            | Indicates a situation that might result in loss of data or hardware damage. |

Table 2 defines the text and syntax conventions used in this guide..

**Table 2: Text and Syntax Conventions (1 of 2)**

| Convention                        | Element   | Example  |
|-----------------------------------|---|--|
| <b>Bold sans serif typeface</b>   | Represents text that you type.  | To enter configuration mode, type the configure command:<br><br>user@host> <b>configure</b>  |
| Fixed-width typeface              | Represents output on the terminal screen.   | user@host> <b>show chassis alarms</b><br>No alarms currently active  |
| <i>Italic typeface</i>            | <ul style="list-style-type: none"> <li>Introduces important new terms.</li> <li>Identifies book names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>    | <ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>JUNOS System Basics Configuration Guide</i></li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul> |
| <i>Italic sans serif typeface</i> | Represents variables (options for which you substitute a value) in commands or configuration statements.  | Configure the machine's domain name:<br>[edit]<br>root@# <b>set system domain-name</b> <i>domain-name</i>  |
| Sans serif typeface               | Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components. | <ul style="list-style-type: none"> <li>To configure a stub area, include the <b>stub</b> statement at the [edit protocols ospf area <i>area-id</i>] hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>               |
| < > (angle brackets)              | Enclose optional keywords or variables.   | stub <default-metric <i>metric</i> >;  |
| (pipe symbol)                     | Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.  | broadcast   multicast<br>( <i>string1</i>   <i>string2</i>   <i>string3</i> )  |
| # (pound sign)                    | Indicates a comment specified on the same line as the configuration statement to which it applies.  | rsvp { # Required for dynamic MPLS only  |
| [ ] (square brackets)             | Enclose a variable for which you can substitute one or more values.   | community name members [ <i>community-ids</i> ]  |

**Table 2: Text and Syntax Conventions (2 of 2)**

| Convention                     | Element  | Example  |
|--------------------------------|--|--|
| Indentation and braces ( { } ) | Identify a level in the configuration hierarchy.                           | <pre>[edit] routing-options {   static {     route default {       nexthop <i>address</i>;       retain;     }   } }</pre>   |
| ; (semicolon)                  | Identifies a leaf statement at a configuration hierarchy level.            |  |
|                                |  |  |
| J-Web GUI Conventions          |  |  |
| Bold typeface                  | Represents J-Web graphical user interface (GUI) items you click or select. | <ul style="list-style-type: none"><li>■ In the Logical Interfaces box, select <b>All Interfaces</b>.</li><li>■ To cancel the configuration, click <b>Cancel</b>.</li></ul> |
| > (bold right angle bracket)   | Separates levels in a hierarchy of J-Web selections.                       | In the configuration editor hierarchy, select <b>Protocols &gt; Ospf</b> .   |

## Related Juniper Networks Documentation

Table 3 lists the books included in the *Network Operations Guide* series.

**Table 3: JUNOS Internet Software Network Operations Guides**

| Book   | Description  |
|--|--|
| <b>JUNOS Internet Software for M-series and T-series Routing Platforms Network Operations Guides</b> |  |
| <i>Baseline</i>  | Describes the most basic tasks for running a network using Juniper Networks products. Tasks include upgrading and reinstalling JUNOS software, gathering basic system management information, verifying your network topology, and searching log messages.   |
| <i>Interfaces</i>  | Describes tasks for monitoring interfaces. Tasks include using loopback testing and locating alarms.   |
| <i>MPLS</i>  | Describes tasks for configuring, monitoring, and troubleshooting an example MPLS network. Tasks include verifying the correct configuration of the MPLS and RSVP protocols, displaying the status and statistics of MPLS running on all routers in the network, and using the layered MPLS troubleshooting model to investigate problems with an MPLS network. |
| <i>Hardware</i>  | Describes tasks for monitoring M-series and T-series routing platforms.  |

Table lists the software and hardware guides and release notes for Juniper Networks J-series, M-series, and T-series routing platforms and describes the contents of each document..

**Table 4: Technical Documentation for J-series, M-series, and T-series Routing Platforms (1 of 3)**

| Document   | Description   |
|--|---|
| <b>JUNOS Internet Software for J-series, M-series, and T-series Routing Platforms Configuration Guides</b> |   |
| <i>Class of Service</i>  | Provides an overview of the class-of-service (CoS) functions of the JUNOS software and describes how to configure CoS features, including configuring multiple forwarding classes for transmitting packets, defining which packets are placed into each output queue, scheduling the transmission service level for each queue, and managing congestion through the random early detection (RED) algorithm. |
| <i>CLI User Guide</i>  | Describes how to use the JUNOS command-line interface (CLI) to configure, monitor, and manage Juniper Networks routing platforms. This material was formerly covered in <i>JUNOS System Basics Configuration Guide</i> .  |
| <i>Feature Guide</i>   | Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.  |
| <i>JUNOS-FIPS</i>  | (M-series and T-series routing platforms only) Provides an overview of JUNOS-FIPS 140-2 concepts and describes how to install and configure the JUNOS-FIPS software. Describes FIPS-related commands and how to configure, authorize, and zeroize the Adaptive Services (AS) II FIPS Physical Interface Card (PIC).   |
| <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 Interfaces</i>  | Provides an overview of the network interface functions of the JUNOS software and describes how to configure the network interfaces on the routing platform.  |
| <i>Network Management</i>  | Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP and accounting options.  |
| <i>Policy Framework</i>  | Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, forwarding options, and cflowd.  |
| <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 routing platform.   |
| <i>Software Installation and Upgrade Guide</i>   | Provides a description of JUNOS software components and packaging, and includes detailed information about how to initially configure, reinstall, and upgrade the JUNOS system software. This material was formerly covered in <i>JUNOS System Basics Configuration Guide</i> .   |
| <i>System Basics</i>   | Describes Juniper Networks routing platforms, and provides information about how to configure basic system parameters, supported protocols and software processes, authentication, and a variety of utilities for managing your router on the network.  |
| <i>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.   |

**Table 4: Technical Documentation for J-series, M-series, and T-series Routing Platforms (2 of 3)**

| Document   | Description  |
|--|--|
| <b>JUNOS References</b>  |  |
| <i>Hierarchy and RFC Reference</i>   | 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 <i>JUNOS System Basics Configuration Guide</i> .   |
| <i>Interfaces Command Reference</i>  | Describes the JUNOS software operational mode commands you use to monitor and troubleshoot interfaces.   |
| <i>Routing Protocols and Policies Command Reference</i>                      | Describes the JUNOS software operational mode commands you use to monitor and troubleshoot routing protocols and policies, including firewall filters.   |
| <i>System Basics and Services Command Reference</i>                          | 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. Also describes commands for monitoring and troubleshooting services such as CoS, IP Security (IPSec), stateful firewalls, flow collection, and flow monitoring.   |
| <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.  |
| <b>J-Web User Guide</b>  |  |
| <i>J-Web Interface User Guide</i>  | Describes how to use the J-Web GUI to configure, monitor, and manage Juniper Networks routing platforms.   |
| <b>JUNOS API and Scripting Documentation</b>                                 |  |
| <i>JUNOScript API Guide</i>  | Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routing platforms.   |
| <i>JUNOS XML API Configuration Reference</i>                                 | Provides reference pages for the configuration tag elements in the JUNOS XML API.  |
| <i>JUNOS XML API Operational Reference</i>                                   | Provides reference pages for the operational tag elements in the JUNOS XML API.  |
| <i>JUNOS Configuration and Diagnostic Automation Guide</i>                   | Provides an overview, instructions for using, and examples of the commit script and self-diagnosis features of the JUNOS software. This guide explains how to enforce custom configuration rules defined in scripts that run at commit time, how to use commit script macros to provide simplified aliases for frequently used configuration statements, and how to configure diagnostic event policies and actions associated with each policy. |
| <i>NETCONF API Guide</i>   | Describes how to use the NETCONF API to monitor and configure Juniper Networks routing platforms.  |
| <b>JUNOS Comprehensive Index and Glossary</b>                                |  |
| <i>Comprehensive Index and Glossary</i>                                      | Provides a complete index of all JUNOS software books, the <i>JUNOScript API Guide</i> , and the <i>NETCONF API Guide</i> . Also provides a comprehensive glossary.  |
| <b>JUNOScope Documentation</b>   |  |
| <i>JUNOScope Software User Guide</i>   | Describes the JUNOScope software GUI, how to install and administer the software, and how to use the software to manage routing platform configuration files and monitor routing platform operations.  |
| <b>J-series Services Router Documentation</b>                                |  |
| <i>J-series Services Router Getting Started Guide</i>                        | Provides an overview, basic instructions, and specifications for J-series Services Routers. The guide explains how to prepare your site for installation, unpack and install the router and its components, install licenses, and establish basic connectivity.  |
| <i>J-series Services Router Basic LAN and WAN Access Configuration Guide</i> | Explains how to configure the interfaces on J-series Services Routers for basic IP routing with standard routing protocols, ISDN backup, and digital subscriber line (DSL) connections.  |



**Table 4: Technical Documentation for J-series, M-series, and T-series Routing Platforms (3 of 3)**

| Document  | Description   |
|---|---|
| <i>J-series Services Router Advanced WAN Access Configuration Guide</i> | Explains how to configure J-series Services Routers in virtual private networks (VPNs) and multicast networks, configure data link switching (DLSw) services, and apply routing techniques such as policies, stateless and stateful firewall filters, IP Security (IPSec) tunnels, and class-of-service (CoS) classification for safer, more efficient routing. |
| <i>J-series Services Router Administration Guide</i>                    | Shows how to manage users and operations, monitor network performance, upgrade software, and diagnose common problems on J-series Services Routers.   |
| <b>M-series and T-series Hardware Documentation</b>                     |   |
| <i>Hardware Guide</i>   | Describes how to install, maintain, and troubleshoot routing platforms and components. Each platform has its own hardware guide.  |
| <i>PIC Guide</i>  | Describes the routing platform PICs. Each platform has its own PIC guide.   |
| <b>Release Notes</b>  |   |
| <i>JUNOS Release Notes</i>  | Summarize new features and known problems for a particular software release, provide corrections and updates to published JUNOS, JUNOScript, and NETCONF 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 routing platform and the supported PICs, 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 the J-series Services Router features, identify known hardware problems, and provide upgrade and downgrade instructions.   |

## Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. Send your comments to [techpubs-comments@juniper.net](mailto: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

## 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 (from the United States, Canada, or Mexico) or 1-408-745-9500 (from elsewhere).

