

About This Guide

This chapter provides a high-level overview of the *JUNOS Internet Software for M-series and T-series Routing Platforms Interfaces Operations Guide*:

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Objectives

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

This manual is designed for Network Operations Center (NOC) personnel who monitor a Juniper Networks router. It assumes that you have a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. This manual assumes that you are familiar with one or more of the following Internet routing protocols: Border Gateway Protocol (BGP), Routing Information Protocol (RIP), Intermediate System-to-Intermediate System (IS-IS), Open Shortest Path First (OSPF), Internet Control Message Protocol (ICMP) router discovery, Internet Group Management Protocol (IGMP), Distance Vector Multicast Routing Protocol (DVMRP), Protocol-Independent Multicast (PIM), Multiprotocol Label Switching (MPLS), Resource Reservation Protocol (RSVP), and 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.

Document Organization

This manual is divided into several parts. Each part describes the most common tasks for monitoring a particular interface, and the individual chapters within a part describe one or more step-by-step procedures for each task.

This manual contains the following parts:

Preface, “About This Guide” (this chapter), provides a brief description of the contents and organization of this manual and describes how to contact customer support.

Part 1, “Overview of Interfaces,” provides an overview of interfaces supported by Juniper Networks, and the basic strategies for monitoring and troubleshooting an interface.

Part 2, “Investigate T1 Interfaces,” describes steps you use to monitor T1 interfaces and isolate T1 interface problems. Also included is information about the most common T1 interface alarms and errors.

Part 3, “Investigate T3 Interfaces,” describes steps you use to monitor T3 interfaces and isolate T3 interface problems. Also included is information about the most common T3 interface alarms and errors.

Part 4, “Investigate ATM Interfaces,” describes steps you use to monitor ATM interfaces and isolate ATM interface problems. Also included is information about the most common ATM interface alarms and errors.

Part 5, “Investigate SONET Interfaces,” describes steps you use to monitor SONET interfaces and isolate SONET interface problems. Also included is information about the most common SONET interface alarms and errors.

Part 6, “Investigate Fast Ethernet and Gigabit Ethernet Interfaces,” describes steps you use to monitor Fast Ethernet and Gigabit Ethernet interfaces and isolate Fast Ethernet and Gigabit Ethernet interface problems. Also included is information about the most common Fast Ethernet and Gigabit Ethernet interface alarms and errors.

Part 7, “Investigate Channelized Interfaces,” describes steps you use to monitor Multichannel DS-3 interfaces and isolate Multichannel DS-3 interface problems. Also included is information about the most common Multichannel DS-3 interface alarms and errors.

This manual also contains a complete index. For a list and description of glossary terms, see the *JUNOS Comprehensive Index and Glossary*.

Chapter Organization

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 xx.

Documentation Conventions

This section presents general text conventions used for statements, commands, and output. Also included are the details for providing documentation feedback and for contacting technical support.

General Conventions

This manual uses the following text conventions:

Statements, commands, filenames, directory names, IP addresses, and configuration hierarchy levels are shown in a sans serif font. In the following example, *stub* is a statement name and [edit protocols ospf area *area-id*] is a configuration hierarchy level:

To configure a stub area, include the stub statement at the [edit protocols ospf area *area-id*] hierarchy level:

In examples, text that you type literally is shown in bold. In the following example, you type the word *show*:

```
[edit protocols ospf area area-id]  
cli# show  
stub <default-metric metric>
```

Examples of command output are generally shown in a fixed-width font to preserve the column alignment. For example:

```
user@host> show interfaces terse  
Interface    Admin Link Proto Local      Remote  
at-1/3/0     up   up  
at-1/3/0.0   up   up   inet 1.0.0.1    --> 1.0.0.2  
                                     iso  
fxp0         up   up  
fxp0.0       up   up   inet 192.168.5.59/24
```

Conventions for Software Commands and Statements

When describing the JUNOS software, this manual uses the following type and presentation conventions:

Statement or command names that you type literally are shown nonitalicized. In the following example, the statement name is *area*:

You configure all these routers by including the following area statement at the [edit protocols ospf] hierarchy level:

Options, which are variable terms for which you substitute appropriate values, are shown in italics. In the following example, *area-id* is an option. When you type the area statement, you substitute a value for *area-id*.

```
area area-id;
```

Optional portions of a configuration statement are enclosed in angle brackets. In the following example, the “default-metric *metric*” portion of the statement is optional:

```
stub <default-metric metric>;
```

For text strings separated by a pipe (|), you must specify either *string1* or *string2*, but you cannot specify both or neither of them. Parentheses are sometimes used to group the strings.

```
string1 | string2
(string1 | string2)
```

In the following example, you must specify either broadcast or multicast, but you cannot specify both:

```
broadcast | multicast
```

For some statements, you can specify a set of values. The set must be enclosed in square brackets. For example:

```
community name members [ community-ids ]
```

The configuration examples in this manual are generally formatted in the way that they appear when you issue a show command. This format includes braces ({ }) and semicolons. When you type configuration statements in the CLI, you do not type the braces and semicolons. However, when you type configuration statements in an ASCII file, you must include the braces and semicolons. For example:

```
[edit]
cli# set routing-options static route default nexthop address retain
[edit]
cli# show
routing-options {
    static {
        route default {
            nexthop address;
            retain;
        }
    }
}
```

Comments in the configuration examples are shown either preceding the lines that the comments apply to, or more often, they appear on the same line. When comments appear on the same line, they are preceded by a pound sign (#) to indicate where the comment starts. In an actual configuration, comments can only precede a line; they cannot be on the same line as a configuration statement. For example:

```
protocols {
    mpls {
        interface (interface-name | all);# Required to enable MPLS on the
interface
    }
    rsvp {                                # Required for dynamic MPLS only
        interface interface-name;
    }
}
```

The general syntax descriptions provide no indication of the number of times you can specify a statement, option, or keyword. This information is provided in the text of the statement summary.

List of Technical Publications

Table 1 lists the books included in the *Network Operations Guide* series.

Table 1: Operations Guides

Book	Description
JUNOS Internet Software Operations Guides	
<i>Baseline</i>	Describes the most basic tasks for running a network using Juniper Networks products. Tasks include upgrading and reinstalling JUNOS Internet software, gathering basic system management information, verifying your network topology, and searching log messages.
<i>Interfaces</i>	Describes tasks for monitoring interfaces.
<i>MPLS Applications</i> (Under Development)	Describes tasks for monitoring MPLS applications.
<i>Router Hardware</i>	Describes tasks for monitoring M-series and T-series routers.
<i>Routing and Routing Protocols</i> (Under Development)	Describes tasks for monitoring routing protocols.

Table 2 lists the software and hardware books for Juniper Networks routers and describes the contents of each book.

Table 2: Juniper Networks Technical Documentation

Book	Description
JUNOS Internet Software Configuration Guides	
<i>Feature Guide</i>	Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.
<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>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 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 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.

Book	Description
<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>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 Internet Software References	
<i>Network and Services Interfaces Command Reference</i>	Describes the JUNOS software operational mode commands you use to monitor and troubleshoot network and services interfaces on Juniper Networks M-series and T-series routing platforms.
<i>Protocols, Class of Service, and System Basics Command Reference</i>	Describes the JUNOS software operational mode commands you use to monitor and troubleshoot most aspects of Juniper Networks M-series and T-series 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 routing platforms.
<i>JUNOScript API Configuration Reference</i>	Provides a reference page for the configuration tags in the JUNOScript API.
<i>JUNOScript API Operational Reference</i>	Provides a reference page for the operational tags in the JUNOScript API.
JUNOS Internet Software Comprehensive Index and Glossary	
<i>Comprehensive Index and Glossary</i>	Provides a complete index of all JUNOS software books and the <i>JUNOScript API Guide</i> . Also provides a comprehensive glossary.
Hardware Documentation	
<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 Physical Interface Cards (PICs). Each platform has its own PIC guide.
JUNOScope Software	
<i>JUNOScope Software 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 routing platform configuration files and monitor routing platform operations.
Release Notes	
<i>JUNOS Internet Software Release Notes</i>	Summarize new features and known problems for a particular software release, provide corrections and updates to published JUNOS and JUNOScript manuals, provide information that might have been omitted from the manuals, and describe upgrade and downgrade procedures.
<i>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.

Documentation Feedback

We are always interested in hearing from our customers. Please let us know what you like and do not like about the Juniper Networks documentation, and let us know of any suggestions you have for improving the documentation. Also, let us know if you find any mistakes in the documentation. Send your feedback to techpubs-comments@juniper.net.

How to Request Support

For technical support, contact Juniper Networks at support@juniper.net, or at 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).