

About This Manual

This chapter provides a high-level overview of the *JUNOS Internet Software Configuration Guide: Network Interfaces and Class of Service* :

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Objectives

This manual provides an overview of the interface and class of service features of the JUNOS Internet software and describes how to configure these properties on the router.

This manual documents Release 6.0 of the JUNOS Internet software. To obtain additional information about the JUNOS software—either corrections to information in this manual or information that might have been omitted from this manual—refer to the software release notes.

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

To order printed copies of this manual or to order a documentation CD-ROM, which contains this manual, please contact your sales representative.

Audience

This manual is designed for network administrators who are configuring 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).

Document Organization

This manual is divided into several parts. Each part describes a major functional area of the JUNOS software, and the individual chapters within a part describe the software commands of that functional area.

This manual contains the following parts and chapters:

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

Part 1, “Overview,” provides an overview of how to configure the router’s interface and class of service properties:

Chapter 1, “Network Interfaces and Class of Service Overview,” describes the router’s interfaces and tools for processing traffic using class-of-service techniques.

Chapter 2, “Interfaces and Class of Service Configuration Statements,” lists all commands discussed in this manual and shows their hierarchy.

Part 2, “Router Interfaces,” includes an overview chapter, chapters that describe physical, logical, and family interface statements and properties, and chapters that describe cross-connects and trace operations:

Chapter 3, “Interfaces Overview,” provides an overview of interfaces, including a description of the interfaces supported by the router and interface naming conventions.

Chapter 4, “Interfaces Configuration Statements,” lists all statements used to configure the interfaces.

Chapter 5, “Configure Physical Interface Properties,” provides a description of the interface statements used at the physical layer.

Chapter 6, “Configure Logical Interface Properties,” describes the process of configuring logical interfaces within a physical interface.

Chapter 7, “Configure Protocol Family and Address Interface Properties,” explains the assignment of a protocol family to an interface.

Chapter 8, “Configure Circuit and Translational Cross-Connects,” explains the use of cross-connect techniques across Layer 2 physical interfaces.

Chapter 9, “Trace Interface Operations,” describes how to trace interface operations.

Part 3, “Interface Types,” includes chapters that describe each interface type and its associated statements and properties:

Chapter 10, “Configure Adaptive Services Interfaces,” documents the configuration of the adaptive services interface.

Chapter 11, “Configure ATM 1 and ATM 2 Interfaces,” explains interfaces designed for Asynchronous Transfer Mode encapsulation.

Chapter 12, “Channelized Interfaces Overview,” provides a high-level overview of channelized interfaces, focusing mainly on the capabilities, properties, and structure of Channelized QPP interfaces.

Chapter 13, “Configure Channelized E1 Interfaces,” details the configuration of the Channelized E1 and Channelized E1 QPP interface types, used outside North America.

Chapter 14, “Configure Channelized OC-12 Interfaces,” details the configuration of the Channelized OC-12 and Channelized OC-12 QPP interface types.

Chapter 15, “Configure Channelized STM-1 Interfaces,” details the configuration of the Channelized STM-1 and Channelized STM-1 QPP interface types.

Chapter 16, “Configure Channelized T3 Interfaces,” details the configuration of the Channelized T3 and Channelized T3 QPP interface types.

Chapter 17, “Configure Discard Interfaces,” details the configuration of the discard interface.

Chapter 18, “Configure E1 Interfaces,” details the configuration of the E1 interface type, used outside North America.

Chapter 19, “Configure E3 Interfaces,” details the configuration of the E3 interface type, used outside North America.

Chapter 20, “Configure Encryption Interfaces,” details the configuration of tunnel interfaces that use the ES PIC.

Chapter 21, “Configure Ethernet Interfaces,” provides configuration information about the Fast Ethernet and Gigabit Ethernet interface types.

Chapter 22, “Configure Frame Relay,” explains the configuration of Frame Relay interface encapsulation on logical interfaces.

Chapter 23, “Configure the Loopback Interface,” documents the configuration of the loopback interface and explains how to set loopback addresses.

Chapter 24, “Configure Monitoring Services Interfaces,” documents the configuration of flow monitoring and accounting interfaces.

Chapter 25, “Configure Multilink and Link Services Interfaces,” documents the configuration of multilink and link services interfaces and describes how to set up links and bundles.

Chapter 26, “Configure Serial Interfaces,” documents the configuration of the serial interface.

Chapter 27, “Configure SONET/SDH Interfaces,” documents the configuration of the various high-speed fiber-optic interface types.

Chapter 28, “Configure T1 Interfaces,” explains the use of the T1 interface type used in North America.

Chapter 29, “Configure T3 Interfaces,” explains the use of the DS-3 metallic interface type used in North America.

Chapter 30, “Configure Tunnel Interfaces,” explains how to use a Tunnel PIC to set up unicast, multicast, IPv6-over-IPv4, and PIM tunnels, and describes how to use a Tunnel PIC for route and VRF table lookups.

Chapter 31, “Summary of Interface Configuration Statements,” provides a detailed listing of all configuration statements used the “Router Interfaces” and “Interface Types” parts of the manual.

Part 4, “CoS,” describes how to configure and monitor the JUNOS software to support CoS decision-making:

Chapter 32, “CoS Overview,” introduces the concept of CoS.

Chapter 33, “CoS Configuration Guidelines,” describes how to configure CoS.

Chapter 34, “Summary of CoS Configuration Statements,” provides a detailed listing of all CoS-related configuration statements.

This manual also contains a glossary, a complete index, and an index of statements and commands.

Part Organization

The parts in this manual typically contain the following chapters:

Overview—Provides background information about and discusses concepts related to the software component described in that part of the book.

Configuration statements—Lists all the configuration statements available to configure the software component. This list is designed to provide an overview of the configuration statement hierarchy for that software component.

Configuration guidelines—Describes how to configure all the features of the software component. The first section of the configuration guidelines describes the minimum configuration for that component, listing the configuration statements you must include to enable the software component on the router with only the bare minimum functionality. The remaining sections in the configuration guidelines are generally arranged so that the most common features are near the beginning.

Statement summary—A reference that lists all configuration statements alphabetically and explains each statement and all its options. The explanation of each configuration statement consists of the following parts:

Syntax—Describes the full syntax of the configuration statement. For an explanation of how to read the syntax statements, see “Documentation Conventions” on page xxxviii.

Hierarchy level—Tells where in the configuration statement hierarchy you include the statement.

Description—Describes the function of the configuration statement.

Options—Describes the configuration statement’s options, if there are any. For options with numeric values, the allowed range and default value, if any, are listed. For multiple options, if one option is the default, that fact is stated. If a configuration statement is at the top of a hierarchy of options that are other configuration statements, these options are generally explained separately in the statement summary section.

Usage guidelines—Points to the section or sections in the configuration guidelines section that describe how to use the configuration statement.

Required privilege level—Indicates the permissions that the user must have to view or modify the statement in the router configuration. For an explanation of the permissions, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

See also—Indicates other configuration statements that might provide related or similar functionality.

Using the Indexes

This manual contains two indexes: a complete index, which contains all index entries, and an index that contains only statements and commands.

In the complete index, bold page numbers point to pages in the statement summary chapters. The index entry for each configuration statement always contains at least two entries. The first, with a bold page number on the same line as the statement name, references the statement summary section. The second entry, “usage guidelines,” references the section in a configuration guidelines chapter that describes how to use the statement.

Documentation Conventions

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:

```
> 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 software and hardware books for Juniper Networks routers and describes the contents of each book.

Table 1: 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>Getting Started</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</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 router.
<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 and 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 of Layer 2 and Layer 3 Virtual Private Networks (VPNs), describes how to configure VPNs, and provides configuration examples.
JUNOS Internet Software References	
<i>Operational Mode Command Reference: Interfaces</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot network and services interfaces on Juniper Networks M-series and T-series routers.
<i>Operational Mode Command Reference: Protocols, Class of Service, Chassis, and Management</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot most aspects of Juniper Networks M-series and T-series routers.
<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 API to monitor and configure Juniper Networks routers.
<i>JUNOScript API Reference</i>	Provides a reference page for each tag in the JUNOScript API.
JUNOS Internet Software Comprehensive Index	
<i>Comprehensive Index</i>	Provides a complete index of all JUNOS Internet software books and the <i>JUNOScript API Guide</i> .

Book	Description
Hardware Documentation	
<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.
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.
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 router configuration files and monitor router operations.

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 408-745-9500 (from outside the United States).

