

About This Manual

This chapter provides a high-level overview of the *JUNOS Internet Software Configuration Guide: IPv6*:

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Objectives

This manual provides an overview of IPv6 concepts such as addressing and packet header structure, and discusses the differences between IPv4 and IPv6. This manual also describes how to configure IPv6 on a router and discusses transition from IPv4 to IPv6.

This manual is a standalone reference for users configuring IPv6 on the router. Various configuration guidelines and discussions in this manual are duplicated from existing JUNOS Internet software configuration guides so that you do not need to reference other manuals to complete a configuration for IPv6.

This manual documents Release 5.3 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 Next-Generation (RIPng), Intermediate System to Intermediate System (IS-IS), Internet Control Message Protocol (ICMP) router discovery, 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 basic IPv6 concepts and terminology:

Chapter 1, “IPv6 Overview,” provides a general overview of IPv6, packet header structure, and 128-bit addressing.

Chapter 2, “Complete IPv6 Configuration Statements,” lists the complete configuration statement hierarchy for the statements discussed in this manual. For a complete list of all configuration mode statements and commands, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

Part 2, “IPv6 Interfaces,” describes how to configure IPv6 interface properties:

Chapter 3, “IPv6 Interfaces Overview,” provides an overview of interfaces that support IPv6 addressing.

Chapter 4, “IPv6 Interface Configuration Guidelines,” describes how to configure an IPv6 address on an interface.

Chapter 5, “Summary of IPv6 Interface Configuration Statements,” explains all IPv6 interface configuration statements.

Part 3, “Routing and Routing Protocols for IPv6,” describes how to configure IPv6 routes, routing protocols, and routing properties:

Chapter 6, “Routing Protocols Concepts,” provides an overview of routing protocols. It discusses routing protocol terminology and concepts, including addresses, tracing operations, and route preferences.

Chapter 7, “IPv6 Routing Policy,” describes how to configure routing policy for IPv6.

Chapter 8, “Configure Protocol-Independent Routing Properties,” describes how to configure routing tables, static routes, aggregate routes, generated routes, martian addresses, AS number, router ID, AS confederation members, and other protocol-independent properties.

Chapter 9, “Summary of Protocol-Independent Routing Properties Configuration Statements,” explains all protocol-independent configuration statements.

Chapter 10, “IS-IS Overview,” provides an overview of the IS-IS routing protocol for IPv6.

Chapter 11, “IS-IS Configuration Guidelines,” describes how to configure IS-IS for IPv6.

Chapter 12, “Summary of IS-IS Configuration Statements,” explains all the IS-IS configuration statements for IPv6.

Chapter 13, “RIPng Overview,” provides an overview of the RIPng routing protocol for IPv6.

Chapter 14, “RIPng Configuration Guidelines,” describes how to configure RIPng for IPv6.

Chapter 15, “Summary of RIPng Configuration Statements,” explains all the RIPng configuration statements.

Chapter 16, “Neighbor Discovery Overview,” provides an overview of IPv6 Neighbor Discovery, ICMPv6, and autoconfiguration.

Chapter 17, “Neighbor Discovery Configuration Guidelines,” describes how to configure IPv6 neighbor discovery.

Chapter 18, “Summary of Neighbor Discovery Router Advertisement Configuration Statements,” explains all neighbor discovery configuration statements.

Chapter 19, “BGP Overview,” provides an overview of the BGP routing protocol for IPv6.

Chapter 20, “BGP Configuration Guidelines,” describes how to configure BGP for IPv6.

Chapter 21, “Summary of BGP Configuration Statements,” explains all the BGP configuration statements for IPv6.

Part 4, "IPv6 Firewalls," describes firewall filter support for IPv6:

Chapter 22, "IPv6 Firewall Filtering," provides a discussion of the firewall filter support for IPv6.

Part 5, "SNMP," describes SNMP support for IPv6:

Chapter 23, "SNMP," provides a discussion of the SNMP support for IPv6.

Part 6, "Transition Mechanisms," describes various transition mechanisms from IPv4 to IPv6, and discusses interoperability between IPv4 and IPv6:

Chapter 24, "IPv4-to-IPv6 Transition," provides an overview of the transition mechanisms, such as dual IP layer. This chapter also describes how to configure configured tunnels.

This manual also contains appendixes, 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 xxv.

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, *group* is a statement name and [edit protocols ripng] is a configuration hierarchy level:

To configure a group, include the group statement at the [edit protocols ripng] hierarchy level:

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

```
[edit protocols ripng]
cli# show
group group-name
```

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
fe-0/0/3       up    up
fe-0/0/3.0     up    up   inet  207.17.136.6/27
                                     inet6 3ffe:28ff:9::1/48
```

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 *group*:

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

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

```
export policy-name;
```

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

```
teardown <idle-timeout minutes>;
```

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-id ]
```

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 rib inet.60 static route default nexthop address retain
[edit]
cli# show
routing-options {
  rib inet6.0 {
    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 {
  isis {
    interface (interface-name | all); # Required to enable IS-IS on the interface
  }
}
```

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>Getting Started</i>	Provides an overview of the JUNOS Internet 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>Interfaces and Class of Service</i>	Provides an overview of the interface and class-of-service functions of the JUNOS Internet software and describes how to configure the interfaces on the router.
<i>IPv6</i>	Provides an overview of IPv6 concepts such as addressing and packet header structure, and discusses the differences between IPv4 and IPv6. This manual also describes how to configure IPv6 on a router and discusses transition from IPv4 to IPv6.
<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 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>VPNs</i>	Provides an overview of Layer 2 and Layer 3 Virtual Private Networks (VPNs), describes how to configure VPNs, and provides configuration examples.

Book	Description
JUNOS Internet Software Command Reference	
<i>Operational Mode Command Reference</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot Juniper Networks routers.
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> .
Hardware Documentation	
<i>Hardware Guide</i>	Describes how to install, maintain, and troubleshoot routers and router components. Each router platform (M5 and M10 routers, M20 router, M40 router, M40e router, M160 router, and T640 routing node) has its own hardware guide.
<i>PIC Guide</i>	Describes the router Physical Interface Cards (PICs). Each router platform has its own PIC guide.

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 tech-doc@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 408-745-2121 (from outside the United States).