



Junos[®] OS

RIP Feature Guide



Modified: 2018-01-29

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

Juniper Networks, the Juniper Networks logo, Juniper, and Junos are registered trademarks of Juniper Networks, Inc. and/or its affiliates in the United States and other countries. All other trademarks may be property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Junos® OS RIP Feature Guide

Copyright © 2018 Juniper Networks, Inc. All rights reserved.

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at <https://www.juniper.net/support/eula/>. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

	About the Documentation	xiii
	Documentation and Release Notes	xiii
	Supported Platforms	xiii
	Using the Examples in This Manual	xiv
	Merging a Full Example	xiv
	Merging a Snippet	xv
	Documentation Conventions	xv
	Documentation Feedback	xvii
	Requesting Technical Support	xviii
	Self-Help Online Tools and Resources	xviii
	Opening a Case with JTAC	xviii
Part 1	Overview	
Chapter 1	Introduction to RIP	3
	RIP Overview	3
	Distance-Vector Routing Protocols	3
	RIP Protocol Overview	4
	RIP Packets	5
	Maximizing Hop Count	6
	Split Horizon and Poison Reverse Efficiency Techniques	6
	Limitations of Unidirectional Connectivity	7
	Supported RIP and RIPv6 Standards	8
	Routing Protocol Process Overview for EX Series Switches	8
Chapter 2	Introduction to RIPv6	11
	RIPv6 Overview	11
	RIPv6 Protocol Overview	11
	RIPv6 Standards	12
	RIPv6 Packets	12
	Supported RIP and RIPv6 Standards	13
Part 2	Configuring RIP	
Chapter 3	Configuring a Basic RIP Network	17
	RIP Configuration Overview	17
	Understanding Basic RIP Routing	18
	Example: Configuring a Basic RIP Network	18
	Configuring a RIP Network for EX Series Switches (J-Web Procedure)	25

Chapter 4	Configuring Authentication for RIP Routes	29
	Understanding RIP Authentication	29
	Enabling Authentication with MD5 Authentication (CLI Procedure)	30
	Example: Configuring Authentication for RIP Routes	30
	Example: Configuring Route Authentication for RIP	30
	Enabling Authentication with Plain-Text Passwords (CLI Procedure)	35
	Enabling Authentication with MD5 Authentication (CLI Procedure)	36
	Enabling Authentication with Plain-Text Passwords (CLI Procedure)	37
	Example: Configuring Route Authentication for RIP	38
Chapter 5	Configuring RIP Timers and Demand Circuits	45
	Understanding RIP Timers	45
	Example: Configuring RIP Timers	46
	RIP Demand Circuits Overview	52
	RIP Demand Circuit Packets	53
	Timers Used by RIP Demand Circuits	54
	Example: Configuring RIP Demand Circuits	55
Chapter 6	Configuring BFD for RIP	59
	Understanding BFD for RIP	59
	Example: Configuring BFD for RIP	60
	Understanding BFD Authentication for RIP	65
	BFD Authentication Algorithms	66
	Security Authentication Keychains	67
	Strict Versus Loose Authentication	67
	Example: Configuring BFD Authentication for RIP	67
Chapter 7	Using Metrics to Control Traffic in a RIP Network	75
	Understanding Traffic Control with Metrics in a RIP Network	75
	Example: Controlling Traffic in a RIP Network with an Incoming Metric	76
	Example: Controlling Traffic in a RIP Network with an Outgoing Metric	78
	Example: Configuring the Metric Value Added to Imported RIP Routes	80
Chapter 8	Configuring Point-to-Multipoint RIP Networks	85
	Configuring Point-to-Multipoint RIP Networks Overview	85
	Example: Configuring Point-to-Multipoint RIP Networks	86
Chapter 9	Configuring RIP Import Policy	93
	Understanding RIP Import Policy	93
	Example: Applying Policies to RIP Routes Imported from Neighbors	93
Chapter 10	Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets	101
	Understanding the Sending and Receiving of RIPv1 and RIPv2 Packets	101
	Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets	101
	Verifying the Exchange of RIP Messages	105
Chapter 11	Redistributing Routes Between Two RIP Instances	107
	Understanding Route Redistribution Among RIP Instances	107
	Example: Redistributing Routes Between Two RIP Instances	108

Chapter 12	Tracing RIP Protocol Traffic	115
	Understanding RIP Trace Operations	115
	Example: Tracing RIP Protocol Traffic	116
Part 3	Configuring RIPng	
Chapter 13	Configuring a Basic RIPng Network	123
	Understanding Basic RIPng Routing	123
	Example: Configuring a Basic RIPng Network	123
Chapter 14	Applying Policies to RIPng Routes	131
	Understanding RIPng Import Policies to Filter Routes	131
	Example: Applying Policies to RIPng Routes Imported from Neighbors	131
	Example: Testing a Routing Policy with Complex Regular Expressions	137
Chapter 15	Configuring Traffic Control with Metrics in a RIPng Network	145
	Understanding RIPng Traffic Control with Metrics for Optimizing the Path	
	Cost	145
	Example: Configuring the Metric Value Added to Imported RIPng Routes to	
	Control the Route Selection Process	146
Chapter 16	Configuring RIPng Timers	153
	Understanding RIP Timers	153
	Example: Configuring RIPng Update Interval	154
Chapter 17	Tracing RIPng Protocol Traffic	161
	Understanding RIPng Protocol Traffic Trace Operations	161
	Example: Tracing Global Routing Protocol Operations	162
	Example: Tracing RIPng Protocol Traffic	166
Part 4	Troubleshooting	
Chapter 18	Troubleshooting Network Issues	173
	Working with Problems on Your Network	173
	Isolating a Broken Network Connection	174
	Identifying the Symptoms of a Broken Network Connection	175
	Isolating the Causes of a Network Problem	176
	Taking Appropriate Action for Resolving the Network Problem	177
	Evaluating the Solution to Check Whether the Network Problem Is Resolved . . .	178
Chapter 19	Monitoring and Troubleshooting a RIP Network	181
	Monitoring RIP Routing Information	181
	Understanding RIP Trace Operations	182
	Example: Tracing RIP Protocol Traffic	184
	Verifying a RIP Configuration	188
	Verifying the RIP-Enabled Interfaces	188
	Verifying Reachability of All Hosts in the RIP Network	188

Part 5	Configuration Statements and Operational Commands	
Chapter 20	RIP Configuration Statements	193
	any-sender	194
	authentication-key (Protocols RIP)	195
	authentication-type (Protocols RIP)	196
	bfd-liveness-detection (Protocols RIP)	197
	check-zero	200
	demand-circuit (Protocols RIP)	201
	dynamic-peers	202
	export	203
	graceful-restart (Protocols RIP)	204
	group (Protocols RIP)	205
	holddown (Protocols RIP)	207
	import (Protocols RIP)	208
	interface-type (Protocols RIP)	209
	max-retrans-time	210
	message-size	211
	metric-in (Protocols RIP)	212
	metric-out	213
	neighbor	214
	peer (Protocols RIP)	215
	preference (Protocols RIP)	216
	receive (Protocols RIP)	217
	rib-group (Protocols RIP)	218
	rip	219
	route-timeout (Protocols RIP)	220
	routing-instances (Multiple Routing Entities)	221
	send (Protocols RIP)	223
	traceoptions (Protocols RIP)	224
	update-interval (Protocols RIP)	227
Chapter 21	RIPng Configuration Statements	229
	export (Protocols RIPng)	230
	graceful-restart (Protocols RIPng)	231
	group (Protocols RIPng)	232
	holddown (Protocols RIPng)	233
	import (Protocols RIPng)	234
	metric-in (Protocols RIPng)	235
	metric-out (Protocols RIPng)	236
	neighbor (Protocols RIPng)	237
	preference (Protocols RIPng)	238
	receive (Protocols RIPng)	239
	ripng	240
	route-timeout (Protocols RIPng)	241
	routing-instances (Multiple Routing Entities)	242
	send (Protocols RIPng)	243
	traceoptions (Protocols RIPng)	244
	update-interval (Protocols RIPng)	246

Chapter 22	RIP Operational Commands	247
	clear rip general-statistics	249
	clear rip statistics	250
	restart	252
	show policy	262
	show policy conditions	265
	show rip general-statistics	267
	show rip neighbor	269
	show rip statistics	271
	show route	274
	show route active-path	295
	show route advertising-protocol	300
	show route all	306
	show route best	308
	show route brief	311
	show route detail	313
	show route exact	333
	show route export	335
	show route extensive	338
	show route forwarding-table	356
	show route hidden	374
	show route inactive-path	377
	show route instance	381
	show route next-hop	389
	show route output	395
	show route protocol	400
	show route receive-protocol	413
	show route table	423
	show route terse	461
	test policy	464
Chapter 23	RIPng Operational Commands	467
	clear ripng general-statistics	469
	clear ripng statistics	470
	restart	471
	show policy	481
	show policy conditions	484
	show ripng general-statistics	486
	show ripng neighbor	488
	show ripng statistics	490
	show route	493
	show route active-path	514
	show route advertising-protocol	519
	show route all	525
	show route best	527
	show route brief	530
	show route detail	532
	show route exact	552
	show route export	554

show route extensive	557
show route forwarding-table	575
show route hidden	593
show route inactive-path	596
show route instance	600
show route next-hop	608
show route output	614
show route protocol	619
show route receive-protocol	632
show route table	642
show route terse	680
test policy	683

List of Figures

Part 1	Overview	
Chapter 1	Introduction to RIP	3
	Figure 1: Distance-Vector Protocol	4
	Figure 2: Split Horizon Example	6
	Figure 3: Poison Reverse Example	7
	Figure 4: Limitations of Unidirectional Connectivity	7
Part 2	Configuring RIP	
Chapter 3	Configuring a Basic RIP Network	17
	Figure 5: Sample RIP Network Topology	19
Chapter 4	Configuring Authentication for RIP Routes	29
	Figure 6: RIP Authentication Network Topology	31
	Figure 7: RIP Authentication Network Topology	38
Chapter 5	Configuring RIP Timers and Demand Circuits	45
	Figure 8: RIP Timers Network Topology	47
Chapter 6	Configuring BFD for RIP	59
	Figure 9: RIP BFD Network Topology	62
	Figure 10: RIP BFD Authentication Network Topology	68
Chapter 7	Using Metrics to Control Traffic in a RIP Network	75
	Figure 11: Controlling Traffic in a RIP Network with the Incoming Metric	77
	Figure 12: Controlling Traffic in a RIP Network with the Outgoing Metric	79
	Figure 13: RIP Incoming Metrics Network Topology	80
Chapter 8	Configuring Point-to-Multipoint RIP Networks	85
	Figure 14: Configuring a Point-to-Multipoint RIP Network	87
Chapter 9	Configuring RIP Import Policy	93
	Figure 15: RIP Import Policy Network Topology	94
Chapter 10	Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets	101
	Figure 16: Sending and Receiving RIPv1 and RIPv2 Packets Network Topology ..	102
Chapter 11	Redistributing Routes Between Two RIP Instances	107
	Figure 17: Redistributing Routes Between RIP Instances Network Topology ..	109
Chapter 12	Tracing RIP Protocol Traffic	115
	Figure 18: RIP Trace Operations Network Topology	117

Part 3	Configuring RIPng	
Chapter 13	Configuring a Basic RIPng Network	123
	Figure 19: Sample RIPng Network Topology	124
Chapter 14	Applying Policies to RIPng Routes	131
	Figure 20: RIPng Import Policy Network Topology	132
	Figure 21: Routing Policy Test for Complex Regular Expressions	139
Chapter 15	Configuring Traffic Control with Metrics in a RIPng Network	145
	Figure 22: RIPng Incoming Metrics Network Topology	147
Chapter 16	Configuring RIPng Timers	153
	Figure 23: RIPng Timers Network Topology	155
Chapter 17	Tracing RIPng Protocol Traffic	161
	Figure 24: RIPng Trace Operations Network Topology	167
Part 4	Troubleshooting	
Chapter 18	Troubleshooting Network Issues	173
	Figure 25: Process for Diagnosing Problems in Your Network	174
	Figure 26: Network with a Problem	174
Chapter 19	Monitoring and Troubleshooting a RIP Network	181
	Figure 27: RIP Trace Operations Network Topology	184

List of Tables

	About the Documentation	xiii
	Table 1: Notice Icons	xvi
	Table 2: Text and Syntax Conventions	xvi
Part 2	Configuring RIP	
Chapter 3	Configuring a Basic RIP Network	17
	Table 3: RIP Routing Configuration Summary	25
	Table 4: Edit RIP Global Settings	26
Chapter 4	Configuring Authentication for RIP Routes	29
	Table 5: Configuring MD5 RIP Authentication	30
	Table 6: Configuring Simple RIP Authentication	36
	Table 7: Configuring MD5 RIP Authentication	36
	Table 8: Configuring Simple RIP Authentication	37
Chapter 5	Configuring RIP Timers and Demand Circuits	45
	Table 9: RIP Demand Circuit Packet Types	53
Part 4	Troubleshooting	
Chapter 18	Troubleshooting Network Issues	173
	Table 10: Checklist for Working with Problems on Your Network	173
Chapter 19	Monitoring and Troubleshooting a RIP Network	181
	Table 11: Summary of Key RIP Routing Output Fields	181
Part 5	Configuration Statements and Operational Commands	
Chapter 22	RIP Operational Commands	247
	Table 12: show policy Output Fields	263
	Table 13: show policy conditions Output Fields	265
	Table 14: show rip general-statistics Output Fields	267
	Table 15: show rip neighbor Output Fields	270
	Table 16: show rip statistics Output Fields	272
	Table 17: show route Output Fields	275
	Table 18: show route advertising-protocol Output Fields	301
	Table 19: show route detail Output Fields	313
	Table 20: Next-hop Types Output Field Values	319
	Table 21: State Output Field Values	321
	Table 22: Communities Output Field Values	323
	Table 23: show route export Output Fields	336

	Table 24: show route extensive Output Fields	338
	Table 25: show route forwarding-table Output Fields	359
	Table 26: show route instance Output Fields	382
	Table 27: show route receive-protocol Output Fields	414
	Table 28: show route table Output Fields	424
	Table 29: Next-hop Types Output Field Values	430
	Table 30: State Output Field Values	431
	Table 31: Communities Output Field Values	433
	Table 32: show route terse Output Fields	461
Chapter 23	RIPng Operational Commands	467
	Table 33: show policy Output Fields	482
	Table 34: show policy conditions Output Fields	484
	Table 35: show ripng general-statistics Output Fields	486
	Table 36: show ripng neighbor Output Fields	488
	Table 37: show ripng statistics Output Fields	491
	Table 38: show route Output Fields	494
	Table 39: show route advertising-protocol Output Fields	520
	Table 40: show route detail Output Fields	532
	Table 41: Next-hop Types Output Field Values	538
	Table 42: State Output Field Values	540
	Table 43: Communities Output Field Values	542
	Table 44: show route export Output Fields	555
	Table 45: show route extensive Output Fields	557
	Table 46: show route forwarding-table Output Fields	578
	Table 47: show route instance Output Fields	601
	Table 48: show route receive-protocol Output Fields	633
	Table 49: show route table Output Fields	643
	Table 50: Next-hop Types Output Field Values	649
	Table 51: State Output Field Values	650
	Table 52: Communities Output Field Values	652
	Table 53: show route terse Output Fields	680

About the Documentation

- Documentation and Release Notes on page xiii
- Supported Platforms on page xiii
- Using the Examples in This Manual on page xiv
- Documentation Conventions on page xv
- Documentation Feedback on page xvii
- Requesting Technical Support on page xviii

Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <https://www.juniper.net/documentation/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <https://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- ACX Series
- T Series
- MX Series
- M Series
- SRX Series
- PTX Series
- EX Series
- QFX Series
- OCX Series

Using the Examples in This Manual

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. The example does not become active until you commit the 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.xml;
    }
  }
}
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 [CLI Explorer](#).

Documentation Conventions

[Table 1](#) on [page xvi](#) 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.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

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

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>

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

Convention	Description	Examples
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none">To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.The console port is labeled CONSOLE.
< > (angle brackets)	Encloses 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 (<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)	Encloses a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identifies 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.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none">In the Logical Interfaces box, select All Interfaces.To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at <https://www.juniper.net/documentation/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <https://www.juniper.net/documentation/feedback/>.

- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <https://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <https://www.juniper.net/customers/support/>
- Search for known bugs: <https://prsearch.juniper.net/>
- Find product documentation: <https://www.juniper.net/documentation/>
- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <https://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://entitlementsearch.juniper.net/entitlementsearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <https://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <https://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Introduction to RIP on page 3](#)
- [Introduction to RIPng on page 11](#)

CHAPTER 1

Introduction to RIP

- [RIP Overview on page 3](#)
- [Supported RIP and RIPv6 Standards on page 8](#)
- [Routing Protocol Process Overview for EX Series Switches on page 8](#)

RIP Overview

RIP is an interior gateway protocol (IGP) that uses a distance-vector algorithm to determine the best route to a destination, using the hop count as the metric.

In a RIP network, each router's forwarding table is distributed among the nodes through the flooding of routing table information. Because topology changes are flooded throughout the network, every node maintains the same list of destinations. Packets are then routed to these destinations based on path-cost calculations done at each node in the network.



NOTE: In general, the term *RIP* refers to RIP version 1 and RIP version 2.

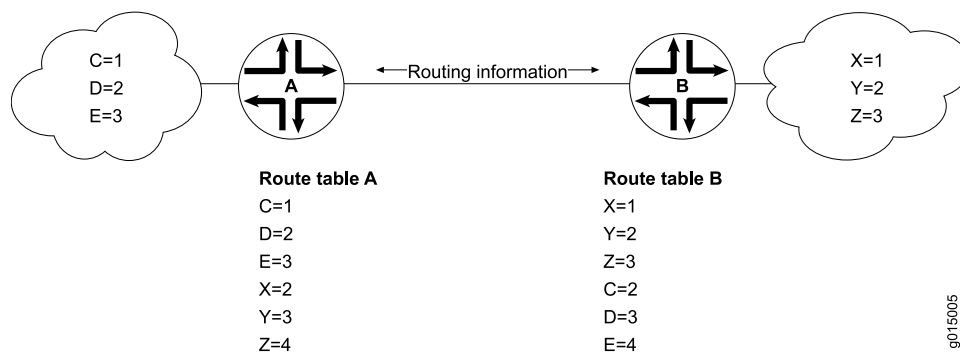
This topic contains the following sections:

- [Distance-Vector Routing Protocols on page 3](#)
- [RIP Protocol Overview on page 4](#)
- [RIP Packets on page 5](#)
- [Maximizing Hop Count on page 6](#)
- [Split Horizon and Poison Reverse Efficiency Techniques on page 6](#)
- [Limitations of Unidirectional Connectivity on page 7](#)

Distance-Vector Routing Protocols

Distance-vector routing protocols transmit routing information that includes a distance vector, typically expressed as the number of hops to the destination. This information is flooded out all protocol-enabled interfaces at regular intervals (every 30 seconds in the case of RIP) to create a network map that is stored in each node's local topology database. [Figure 1 on page 4](#) shows how distance-vector routing works.

Figure 1: Distance-Vector Protocol



In Figure 1 on page 4, Routers A and B have RIP enabled on adjacent interfaces. Router A has known RIP neighbors Routers C, D, and E, which are 1, 2, and 3 hops away, respectively. Router B has known RIP neighbors Routers X, Y, and Z, which are 1, 2, and 3 hops away, respectively. Every 30 seconds, each router floods its entire routing table information out all RIP-enabled interfaces. In this case, flooding exchanges routing table information across the RIP link.

When Router A receives routing information from Router B, it adds 1 to the hop count to determine the new hop count. For example, Router X has a hop count of 1, but when Router A imports the route to X, the new hop count is 2. The imported route also includes information about where the route was learned, so that the original route is imported as a route to Router X through Router B with a hop count of 2.

When multiple routes to the same host are received, RIP uses the distance-vector algorithm to determine which path to import into the forwarding table. The route with the smallest hop count is imported. If there are multiple routes with the same hop count, all are imported into the forwarding table, and traffic is sent along the paths in round-robin fashion.

RIP Protocol Overview

The RIP IGP uses the Bellman-Ford, or *distance-vector*, algorithm to determine the best route to a destination. RIP uses the hop count as the metric. RIP enables hosts and routers to exchange information for computing routes through an IP-based network. RIP is intended to be used as an IGP in reasonably homogeneous networks of moderate size.

The Junos[®] operating system (Junos OS) supports RIP versions 1 and 2.



NOTE: RIP is not supported for multipoint interfaces.

RIP version 1 packets contain the minimal information necessary to route packets through a network. However, this version of RIP does not support authentication or subnetting.

RIP uses User Datagram Protocol (UDP) port 520.

RIP has the following architectural limitations:

- The longest network path cannot exceed 15 hops (assuming that each network, or hop, has a cost of 1).
- RIP depends on counting to infinity to resolve certain unusual situations—When the network consists of several hundred routers, and when a routing loop has formed, the amount of time and network bandwidth required to resolve a next hop might be great.
- RIP uses only a fixed metric to select a route. Other IGPs use additional parameters, such as measured delay, reliability, and load.

RIP Packets

RIP packets contain the following fields:

- Command—Indicates whether the packet is a request or response message. Request messages seek information for the router's routing table. Response messages are sent periodically and also when a request message is received. Periodic response messages are called *update messages*. Update messages contain the command and version fields and 25 destinations (by default), each of which includes the destination IP address and the metric to reach that destination.



NOTE: Beginning with Junos OS Release 11.1, three additional command field types are available to support RIP demand circuits. When you configure an interface for RIP demand circuits, the command field indicates whether the packet is an update request, update response, or update acknowledge message. Neighbor interfaces send updates on demand, not periodically. These command field types are only valid on interfaces configured for RIP demand circuits. For more detailed information, see [“RIP Demand Circuits Overview” on page 52](#).

- Version number—Version of RIP that the originating router is running.
- Address family identifier—Address family used by the originating router. The family is always IP.
- Address—IP address included in the packet.
- Metric—Value of the metric advertised for the address.
- Mask—Mask associated with the IP address (RIP version 2 only).
- Next hop—IP address of the next-hop router (RIP version 2 only).

Routing information is exchanged in a RIP network by RIP request and RIP response packets. A router that has just booted can broadcast a RIP request on all RIP-enabled interfaces. Any routers running RIP on those links receive the request and respond by sending a RIP response packet immediately to the router. The response packet contains the routing table information required to build the local copy of the network topology map.

In the absence of RIP request packets, all RIP routers broadcast a RIP response packet every 30 seconds on all RIP-enabled interfaces. The RIP broadcast is the primary way in which topology information is flooded throughout the network.

Once a router learns about a particular destination through RIP, it starts a timer. Every time it receives a new response packet with information about the destination, the router resets the timer to zero. However, if the router receives no updates about a particular destination for 180 seconds, it removes the destination from its RIP routing table.

In addition to the regular transmission of RIP packets every 30 seconds, if a router detects a new neighbor or detects that an interface is unavailable, it generates a triggered update. The new routing information is immediately broadcast out all RIP-enabled interfaces, and the change is reflected in all subsequent RIP response packets.

Maximizing Hop Count

The successful routing of traffic across a RIP network requires that every node in the network maintain the same view of the topology. Topology information is broadcast between RIP neighbors every 30 seconds. If Router A is many hops away from a new host, Router B, the route to B might take significant time to propagate through the network and be imported into Router A's routing table. If the two routers are 5 hops away from each other, Router A cannot import the route to Router B until 2.5 minutes after Router B is online (30 seconds per hop). For large numbers of hops, the delay becomes prohibitive. To help prevent this delay from growing arbitrarily large, RIP enforces a maximum hop count of 15 hops. Any prefix that is more than 15 hops away is treated as unreachable and assigned a hop count equal to infinity. This maximum hop count is called the *network diameter*.

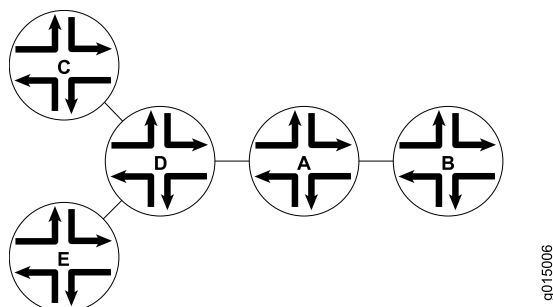
Split Horizon and Poison Reverse Efficiency Techniques

Because RIP functions by periodically flooding the entire routing table out to the network, it generates a lot of traffic. The split horizon and poison reverse techniques can help reduce the amount of network traffic originated by RIP hosts and make the transmission of routing information more efficient.

If a router receives a set of route advertisements on a particular interface, RIP determines that those advertisements do not need to be retransmitted out the same interface. This technique, known as *split horizon*, helps limit the amount of RIP routing traffic by eliminating information that other neighbors on that interface have already learned.

[Figure 2 on page 6](#) shows an example of the split horizon technique.

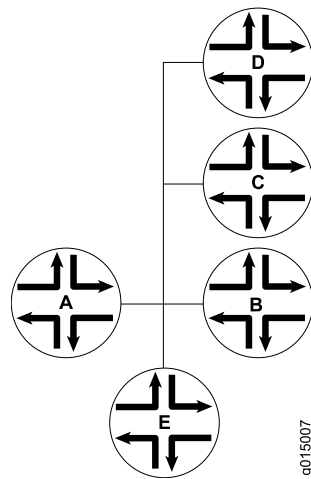
Figure 2: Split Horizon Example



In [Figure 2 on page 6](#), Router A advertises routes to Routers C, D, and E to Router B. In this example, Router A can reach Router C in 2 hops. When Router A advertises the route to Router B, Router B imports it as a route to Router C through Router A in 3 hops. If Router B then readvertised this route to Router A, Router A would import it as a route to Router C through Router B in 4 hops. However, the advertisement from Router B to Router A is unnecessary, because Router A can already reach the route in 2 hops. The split horizon technique helps reduce extra traffic by eliminating this type of route advertisement.

Similarly, the poison reverse technique helps to optimize the transmission of routing information and improve the time to reach network convergence. If Router A learns about unreachable routes through one of its interfaces, it advertises those routes as unreachable (hop count of 16) out the same interface. [Figure 3 on page 7](#) shows an example of the poison reverse technique.

Figure 3: Poison Reverse Example

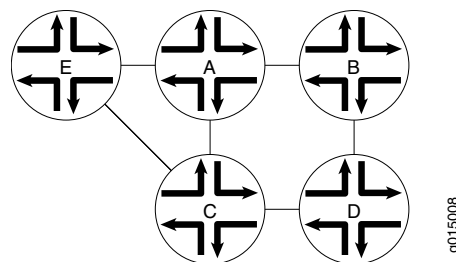


In [Figure 3 on page 7](#), Router A learns through one of its interfaces that routes to Routers C, D, and E are unreachable. Router A readvertises those routes out the same interface as unreachable. The advertisement informs Router B that Routers C, D, and E are definitely not reachable through Router A.

Limitations of Unidirectional Connectivity

Because RIP processes routing information based solely on the receipt of routing table updates, it cannot ensure bidirectional connectivity. As [Figure 4 on page 7](#) shows, RIP networks are limited by their unidirectional connectivity.

Figure 4: Limitations of Unidirectional Connectivity



In [Figure 4 on page 7](#), Routers A and D flood their routing table information to Router B. Because the path to Router E has the fewest hops when routed through Router A, that route is imported into Router B's forwarding table. However, suppose that Router A can transmit traffic but is not receiving traffic from Router B because of an unavailable link or invalid routing policy. If the only route to Router E is through Router A, any traffic destined for Router A is lost, because bidirectional connectivity was never established.

OSPF establishes bidirectional connectivity with a three-way handshake.

- Related Documentation**
- [RIP Configuration Overview on page 17](#)
 - *Example: Configuring RIP*

Supported RIP and RIPng Standards

Junos OS substantially supports the following RFCs, which define standards for RIP (for IP version 4 [IPv4]) and RIP next generation (RIPng, for IP version 6 [IPv6]).

Junos OS supports authentication for all RIP protocol exchanges (MD5 or simple authentication).

- RFC 1058, *Routing Information Protocol*
- RFC 2080, *RIPng for IPv6*
- RFC 2082, *RIP-2 MD5 Authentication*

Multiple keys using distinct key IDs are not supported.

- RFC 2453, *RIP Version 2*

The following RFC does not define a standard, but provides information about RIPng. The IETF classifies it as "Informational."

- RFC 2081, *RIPng Protocol Applicability Statement*

- Related Documentation**
- *Supported IPv4, TCP, and UDP Standards*
 - *Supported IPv6 Standards*
 - *Accessing Standards Documents on the Internet*

Routing Protocol Process Overview for EX Series Switches

Junos OS is based on the FreeBSD Unix operating system. The open source software is modified and hardened to operate in the device's specialized environment. For example, some executables have been deleted, while other utilities were de-emphasized. Additionally, certain software processes were added to enhance the routing functionality. The result of this transformation is the kernel, the heart of the Junos OS software.

The kernel is responsible for operating multiple processes that perform the actual functions of the device. Each process operates in its own protected memory space, while

the communication among all the processes is still controlled by the kernel. This separation provides isolation between the processes, and resiliency in the event of a process failure. This is important in a core routing platform because a single process failure does not cause the entire device to cease functioning.

Some of the common software processes include the routing protocol process (rpd) that controls the device's protocols, the device control process (dcd) that controls the device's interfaces, the management process (mgd) that controls user access to the device, the chassis process (chassisd) that controls the device's properties itself, and the Packet Forwarding Engine process (pfed) that controls the communication between the device's Packet Forwarding Engine and the Routing Engine. The kernel also generates specialized processes as needed for additional functionality, such as SNMP, the Virtual Router Redundancy Protocol (VRRP), and Class of Service (CoS).

The routing protocol process is a software process within the Routing Engine software, which controls the routing protocols that run on the device. Its functionality includes all protocol messages, routing table updates, and implementation of routing policies.

The routing protocol process starts all configured routing protocols and handles all routing messages. It maintains one or more routing tables, which consolidate the routing information learned from all routing protocols. From this routing information, the routing protocol process determines the active routes to network destinations and installs these routes into the Routing Engine's forwarding table. Finally, it implements routing policy, which allows you to control the routing information that is transferred between the routing protocols and the routing table. Using routing policy, you can filter and limit the transfer of information as well as set properties associated with specific routes.

- Related Documentation**
- *show system processes*
 - *show task*
 - *show task memory*

CHAPTER 2

Introduction to RIPng

- [RIPng Overview on page 11](#)
- [Supported RIP and RIPng Standards on page 13](#)

RIPng Overview

The Routing Information Protocol next generation (RIPng) is an interior gateway protocol (IGP) that uses a distance-vector algorithm to determine the best route to a destination, using hop count as the metric. RIPng exchanges routing information used to compute routes and is intended for IP version 6 (IPv6)-based networks. RIPng is disabled by default.

On devices in secure context, IPv6 is disabled. You must enable IPv6 to use RIPng. For instructions, see the *Junos OS Interfaces Configuration Guide for Security Devices*.

This topic contains the following sections:

- [RIPng Protocol Overview on page 11](#)
- [RIPng Standards on page 12](#)
- [RIPng Packets on page 12](#)

RIPng Protocol Overview

The RIPng IGP uses the Bellman-Ford distance-vector algorithm to determine the best route to a destination, using hop count as the metric. RIPng allows hosts and routers to exchange information for computing routes through an IP-based network. RIPng is intended to act as an IGP for moderately-sized autonomous systems.

RIPng is a distinct routing protocol from RIPv2. The Junos OS implementation of RIPng is similar to RIPv2, but has the following differences:

- RIPng does not need to implement authentication on packets.
- Junos OS does not support multiple instances of RIPng.
- Junos OS does not support RIPng routing table groups.

RIPng is a UDP-based protocol and uses UDP port 521.

RIPng has the following architectural limitations:

- The longest network path cannot exceed 15 hops (assuming that each network, or hop, has a cost of 1).
- RIPng is prone to routing loops when the routing tables are reconstructed. Especially when RIPng is implemented in large networks that consist of several hundred routers, RIPng might take an extremely long time to resolve routing loops.
- RIPng uses only a fixed metric to select a route. Other IGPs use additional parameters, such as measured delay, reliability, and load.

RIPng Standards

RIPng is defined in the following documents:

- RFC 2080, *RIPng for IPv6*
- RFC 2081, *RIPng Protocol Applicability Statement*

To access Internet Requests for Comments (RFCs) and drafts, see the Internet Engineering Task Force (IETF) website.

RIPng Packets

A RIPng packet header contains the following fields:

- Command—Indicates whether the packet is a request or response message. Request messages seek information for the router's routing table. Response messages are sent periodically or when a request message is received. Periodic response messages are called update messages. Update messages contain the command and version fields and a set of destinations and metrics.
- Version number—Specifies the version of RIPng that the originating router is running. This is currently set to Version 1.

The rest of the RIPng packet contains a list of routing table entries consisting of the following fields:

- Destination prefix—128-bit IPv6 address prefix for the destination.
- Prefix length—Number of significant bits in the prefix.
- Metric—Value of the metric advertised for the address.
- Route tag—A route attribute that must be advertised and redistributed with the route. Primarily, the route tag distinguishes external RIPng routes from internal RIPng routes when routes must be redistributed across an exterior gateway protocol (EGP).

Related Documentation

- [RIP Overview on page 3](#)
- [Example: Configuring a Basic RIPng Network on page 123](#)

Supported RIP and RIPng Standards

Junos OS substantially supports the following RFCs, which define standards for RIP (for IP version 4 [IPv4]) and RIP next generation (RIPng, for IP version 6 [IPv6]).

Junos OS supports authentication for all RIP protocol exchanges (MD5 or simple authentication).

- RFC 1058, *Routing Information Protocol*
- RFC 2080, *RIPng for IPv6*
- RFC 2082, *RIP-2 MD5 Authentication*

Multiple keys using distinct key IDs are not supported.

- RFC 2453, *RIP Version 2*

The following RFC does not define a standard, but provides information about RIPng. The IETF classifies it as “Informational.”

- RFC 2081, *RIPng Protocol Applicability Statement*

Related Documentation

- *Supported IPv4, TCP, and UDP Standards*
- *Supported IPv6 Standards*
- *Accessing Standards Documents on the Internet*

PART 2

Configuring RIP

- [Configuring a Basic RIP Network on page 17](#)
- [Configuring Authentication for RIP Routes on page 29](#)
- [Configuring RIP Timers and Demand Circuits on page 45](#)
- [Configuring BFD for RIP on page 59](#)
- [Using Metrics to Control Traffic in a RIP Network on page 75](#)
- [Configuring Point-to-Multipoint RIP Networks on page 85](#)
- [Configuring RIP Import Policy on page 93](#)
- [Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101](#)
- [Redistributing Routes Between Two RIP Instances on page 107](#)
- [Tracing RIP Protocol Traffic on page 115](#)

CHAPTER 3

Configuring a Basic RIP Network

- [RIP Configuration Overview on page 17](#)
- [Understanding Basic RIP Routing on page 18](#)
- [Example: Configuring a Basic RIP Network on page 18](#)
- [Configuring a RIP Network for EX Series Switches \(J-Web Procedure\) on page 25](#)

RIP Configuration Overview

To achieve basic connectivity between all RIP hosts in a RIP network, you enable RIP on every interface that is expected to transmit and receive RIP traffic, as described in the steps that follow.

To configure a RIP network:

1. Configure network interfaces. See the *Junos OS Interfaces Configuration Guide for Security Devices*.
2. Define RIP groups, which are logical groupings of interfaces, and add interfaces to the groups. Then, configure a routing policy to export directly connected routes and routes learned through RIP routing exchanges. See [“Example: Configuring a Basic RIP Network” on page 18](#).
3. (Optional) Configure metrics to control traffic through the RIP network. See [“Example: Controlling Traffic in a RIP Network with an Incoming Metric” on page 76](#) and [“Example: Controlling Traffic in a RIP Network with an Outgoing Metric” on page 78](#).
4. (Optional) Configure authentication to ensure that only trusted routers participate in the autonomous system’s routing. See [“Enabling Authentication with Plain-Text Passwords \(CLI Procedure\)” on page 35](#) and [“Enabling Authentication with MD5 Authentication \(CLI Procedure\)” on page 30](#).

Related Documentation

- [Junos OS Feature Support Reference for SRX Series and J Series Devices](#)
- [RIP Overview on page 3](#)
- [Verifying a RIP Configuration on page 188](#)

Understanding Basic RIP Routing

RIP is an interior gateway protocol (IGP) that routes packets within a single autonomous system (AS). By default, RIP does not advertise the subnets that are directly connected through the device's interfaces. For traffic to pass through a RIP network, you must create a routing policy to export these routes. Advertising only the direct routes propagates the routes to the immediately adjacent RIP-enabled router only. To propagate all routes through the entire RIP network, you must configure the routing policy to export the routes learned through RIP.

- Related Documentation**
- [RIP Overview on page 3](#)
 - [Example: Configuring a Basic RIP Network on page 18](#)

Example: Configuring a Basic RIP Network

This example shows how to configure a basic RIP network.

- [Requirements on page 18](#)
- [Overview on page 18](#)
- [Configuration on page 19](#)
- [Verification on page 21](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

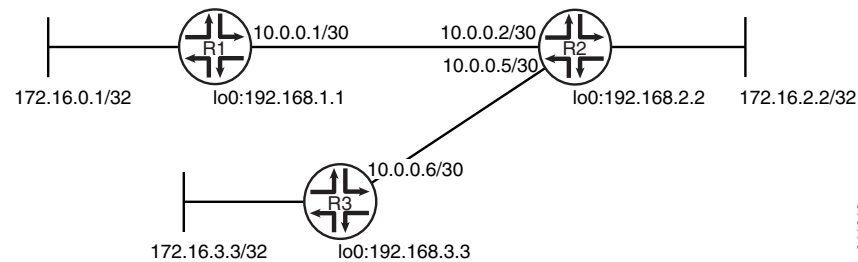
In this example, you configure a basic RIP network, create a RIP group called **rip-group**, and add the directly connected interfaces to the RIP group. Then you configure a routing policy to advertise direct routes using policy statement **advertise-routes-through-rip**.

By default, Junos OS does not advertise RIP routes, not even routes that are learned through RIP. To advertise RIP routes, you must configure and apply an export routing policy that advertises RIP-learned and direct routes.

In Junos OS, you do not need to configure the RIP version. RIP version 2 is used by default.

To use RIP on the device, you must configure RIP on all of the RIP interfaces within the network. [Figure 5 on page 19](#) shows the topology used in this example.

Figure 5: Sample RIP Network Topology



“CLI Quick Configuration” on page 19 shows the configuration for all of the devices in Figure 5 on page 19. The section “Step-by-Step Procedure” on page 20 describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter commit from configuration mode.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
```

```
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

**Step-by-Step
Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a basic RIP network:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
```



```

    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking the Routing Table on page 21](#)
- [Looking at the Routes That Device R1 Is Advertising to Device R2 on page 22](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 22](#)
- [Verifying the RIP-Enabled Interfaces on page 23](#)
- [Verifying the Exchange of RIP Messages on page 23](#)
- [Verifying Reachability of All Hosts in the RIP Network on page 24](#)

Checking the Routing Table

Purpose Verify that the routing table is populated with the expected routes..

Action From operational mode, enter the **show route protocol rip** command.

```

user@R1> show route protocol rip
inet.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.4/30          *[RIP/100] 00:59:15, metric 2, tag 0
                    > to 10.0.0.2 via fe-1/2/0.1

```

```

172.16.2.2/32      *[RIP/100] 02:52:48, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
172.16.3.3/32      *[RIP/100] 00:45:05, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.2.2/32     *[RIP/100] 02:52:48, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.3.3/32     *[RIP/100] 00:45:05, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
224.0.0.9/32       *[RIP/100] 00:45:09, metric 1
                  MultiRecv

```

Meaning The output shows that the routes have been learned from Device R2 and Device R3.

If you were to delete the **from protocol rip** condition in the routing policy on Device R2, the remote routes from Device R3 would not be learned on Device R1.

Looking at the Routes That Device R1 Is Advertising to Device R2

Purpose Verify that Device R1 is sending the expected routes.

Action From operational mode, enter the **show route advertising-protocol rip** command.

```

user@R1> show route advertising-protocol rip 10.0.0.1
inet.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.0.1/32      *[Direct/0] 05:18:26
                  > via lo0.1
192.168.1.1/32     *[Direct/0] 05:18:25
                  > via lo0.1

```

Meaning Device R1 is sending routes to its directly connected networks.

Looking at the Routes That Device R1 Is Receiving from Device R2

Purpose Verify that Device R1 is receiving the expected routes.

Action From operational mode, enter the **show route receive-protocol rip** command.

```

user@R1> show route receive-protocol rip 10.0.0.2
inet.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.4/30        *[RIP/100] 02:31:22, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
172.16.2.2/32      *[RIP/100] 04:24:55, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
172.16.3.3/32      *[RIP/100] 02:17:12, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.2.2/32     *[RIP/100] 04:24:55, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1

```

```
192.168.3.3/32    *[RIP/100] 02:17:12, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
```

Meaning Device R1 is receiving from Device R2 all of Device R2's directly connected networks. Device R1 is also receiving from Device R2 all of Device R3's directly connected networks, which Device R2 learned from Device R3 through RIP.

Verifying the RIP-Enabled Interfaces

Purpose Verify that all RIP-enabled Interfaces are available and active.

Action From operational mode, enter the **show rip neighbor** command.

```
user@R1> show rip neighbor
```

Neighbor	Local State	Source Address	Destination Address	Send Mode	Receive Mode	In Met
fe-1/2/0.1	Up	10.0.0.1	224.0.0.9	mcast	both	1

Meaning The output shows that the RIP-enabled interface on Device R1 is operational.

In general for this command, the output shows a list of the RIP neighbors that are configured on the device. Verify the following information:

- Each configured interface is present. Interfaces are listed in alphabetical order.
- Each configured interface is up. The state of the interface is listed in the **Local State** column. A state of **Up** indicates that the link is passing RIP traffic. A state of **Dn** indicates that the link is not passing RIP traffic. In a point-to-point link, this state generally means that either the end point is not configured for RIP or the link is unavailable.

Verifying the Exchange of RIP Messages

Purpose Verify that RIP messages are being sent and received on all RIP-enabled interfaces.

Action From operational mode, enter the **show rip statistics** command.

```
user@R1> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter              Total    Last 5 min    Last minute
-----
Updates Sent              2669             10             2
Triggered Updates Sent     2              0              0
Responses Sent             0              0              0
Bad Messages              0              0              0
```

RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	2675	11	2
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0
none	0	0	0

Meaning The output shows the number of RIP routes learned. It also shows the number of RIP updates sent and received on the RIP-enabled interfaces. Verify the following information:

- The number of RIP routes learned matches the number of expected routes learned. Subnets learned by direct connectivity through an outgoing interface are not listed as RIP routes.
- RIP updates are being sent on each RIP-enabled interface. If no updates are being sent, the routing policy might not be configured to export routes.
- RIP updates are being received on each RIP-enabled interface. If no updates are being received, the routing policy might not be configured to export routes on the host connected to that subnet. The lack of updates might also indicate an authentication error.

Verifying Reachability of All Hosts in the RIP Network

Purpose Use the **tracert** command on each loopback address in the network to verify that all hosts in the RIP network are reachable from each Juniper Networks device.

Action From operational mode, enter the **tracert** command.

```
user@R1> tracert 192.168.3.3
tracert to 192.168.3.3 (192.168.3.3), 30 hops max, 40 byte packets
 1  10.0.0.2 (10.0.0.2)  1.094 ms  1.028 ms  0.957 ms
 2  192.168.3.3 (192.168.3.3)  1.344 ms  2.245 ms  2.125 ms
```

Meaning Each numbered row in the output indicates a routing hop in the path to the host. The three-time increments indicate the round-trip time (RTT) between the device and the hop for each traceroute packet.

To ensure that the RIP network is healthy, verify the following information:

- The final hop in the list is the host you want to reach.
- The number of expected hops to the host matches the number of hops in the traceroute output. The appearance of more hops than expected in the output indicates that a network segment is probably unreachable. It might also indicate that the incoming or outgoing metric on one or more hosts has been set unexpectedly.

- Related Documentation**
- [Understanding Basic RIP Routing on page 18](#)
 - [RIP Configuration Overview on page 17](#)

Configuring a RIP Network for EX Series Switches (J-Web Procedure)



NOTE: This topic applies only to the J-Web Application package.

You can use the J-Web interface to create RIP networks.

To configure a RIP network:

1. Select **Configure > Routing > RIP**.



NOTE: After you make changes to the configuration on this page, you must commit the changes for them to take effect. To commit all changes to the active configuration, select **Commit Options > Commit**. See [Using the Commit Options to Commit Configuration Changes](#) for details about all commit options.

2. Click one of the following options:
 - **Add**—Configures a RIP instance. Enter information into the RIP Configuration page as described in [Table 3 on page 25](#).
 - **Edit**—Modifies an existing RIP instance. Enter information into the configuration page for RIP as described in [Table 3 on page 25](#).
 - **Delete**—Deletes an existing RIP instance.
4. To modify RIP global settings, click **Edit**. Enter information in the configuration as described in [Table 4 on page 26](#).

Table 3: RIP Routing Configuration Summary

Field	Function	Your Action
General tab		
Routing instance name	Specifies a name for the routing instance.	Type or select and edit the name.
Preference	Specifies the preference of external routes learned by RIP as compared to those learned from other routing protocols.	Type or select and edit the value.
Metric Out	Specifies the metric value to add to routes transmitted to the neighbor.	Type or select and edit the value.

Table 3: RIP Routing Configuration Summary (*continued*)

Field	Function	Your Action
Update interval	Specifies an update time interval to periodically send out routes learned by RIP to neighbors.	Type or select and edit the value.
Route timeout	Specifies the route timeout interval for RIP.	Type or select and edit the value.
Policies tab		
Import Policy	Applies one or more policies to routes being imported into the local routing device from the neighbors.	<p>Click Add to add an import policy.</p> <p>Click Move up or Move down to move the selected policy up or down the list of policies.</p> <p>Click Remove to remove an import policy.</p>
Export Policy	Applies a policy to routes being exported to the neighbors.	<p>Click Add to add an export policy.</p> <p>Click Move up or Move down to move the selected policy up or down the list of policies.</p> <p>Click Remove to remove an export policy.</p>
Neighbors tab		
RIP-Enabled Interfaces	Selects the interfaces to be associated with the RIP instance.	<p>To enable RIP on an interface, click the check box next to the interface name.</p> <p>Click Edit if you want to modify an interface's settings.</p>

Table 4: Edit RIP Global Settings

Field	Function	Your Action
General tab		
Send	Specifies RIP send options.	Select a value.
Receive	Configure RIP receive options.	Select a value.
Route timeout (sec)	Specifies the route timeout interval for RIP.	Type a value.
Update interval (sec)	Specifies the update time interval to periodically send out routes learned by RIP to neighbors.	Type or select and edit the value.
Hold timeout (sec)	Specifies the time period the expired route is retained in the routing table before being removed.	Type or select and edit the value.
Metric in	Specifies the metric to add to incoming routes when advertising into RIP routes that were learned from other protocols.	Type or select and edit the value.
RIB Group	Specifies a routing table group to install RIP routes into multiple routing tables.	Select and edit the name of the routing table group.

Table 4: Edit RIP Global Settings (*continued*)

Field	Function	Your Action
Message size	Specifies the number of route entries to be included in every RIP update message.	Type or select and edit the value.
Check Zero	<p>Specifies whether the reserved fields in a RIP packet are zero. Options are:</p> <ul style="list-style-type: none"> • check-zero—Discard version 1 packets that have nonzero values in the reserved fields and version 2 packets that have nonzero values in the fields that must be zero. This default behavior implements the RIP version 1 and version 2 specifications. • no-check-zero—Receive RIP version 1 packets with nonzero values in the reserved fields or RIP version 2 packets with nonzero values in the fields that must be zero. This is in spite of the fact that they are being sent in violation of the specifications in RFC 1058 and RFC 2453. 	Select a value.
Graceful switchover	Configures graceful switchover for OSPF.	<p>To disable graceful restart, select Disable.</p> <p>Type or select and edit the estimated time for the restart to finish, in seconds.</p>
Authentication Type	<p>Specifies the type of authentication for RIP route queries received on an interface. Options are:</p> <ul style="list-style-type: none"> • None • MD5 • Simple 	<p>Select the authentication type.</p> <p>Enter the authentication key for MD5.</p>
Policies tab		
Import Policy	Applies one or more policies to routes being imported into the local routing device from the neighbors.	<p>Click Add to add an import policy.</p> <p>Click Move up or Move down to move the selected policy up or down the list of policies.</p> <p>Click Remove to remove an import policy.</p>
Export Policy	Applies a policy to routes being exported to the neighbors.	<p>Click Add to add an export policy.</p> <p>Click Move up or Move down to move the selected policy up or down the list of policies.</p> <p>Click Remove to remove an export policy.</p>
Trace Options tab		
File Name	Specifies the name of the file to receive the output of the tracing operation.	Type or select and edit the name.
Number of Files	Specifies the maximum number of trace files.	Type or select and edit the name.

Table 4: Edit RIP Global Settings (*continued*)

Field	Function	Your Action
File Size	Specifies the maximum size for each trace file.	Type or select and edit the name.
World Readable	Specifies whether the trace file can be read by any user or not.	Select True to allow any user to read the file. Select False to disallow all users being able to read the file.
Flags	Specifies the tracing operation to perform.	Select a value from the list.

- Related Documentation**
- [Monitoring RIP Routing Information on page 181](#)
 - *Supported Standards for IS-IS*

CHAPTER 4

Configuring Authentication for RIP Routes

- [Understanding RIP Authentication on page 29](#)
- [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 30](#)
- [Example: Configuring Authentication for RIP Routes on page 30](#)
- [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 37](#)
- [Example: Configuring Route Authentication for RIP on page 38](#)

Understanding RIP Authentication

RIPv2 provides authentication support so that RIP links can require authentication keys (passwords) before they become active. Authentication provides an additional layer of security on the network beyond the other security features. By default, this authentication is disabled.

Authentication keys can be specified in either plain-text or MD5 form. Authentication requires all routers within the RIP network or subnetwork to have the same authentication type and key (password) configured.

This type of authentication is not supported on RIPv1 networks.

Note that the RIPv2 authentication described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Release History Table

Release	Description
15.1X49	Note that the RIPv2 authentication described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [RIP Overview on page 3](#)
- [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 35](#)
- [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 30](#)

Enabling Authentication with MD5 Authentication (CLI Procedure)

To configure authentication that requires an MD5 password to be included in the transmitted packet, enable MD5 authentication by performing these steps on all RIP devices in the network:

1. Navigate to the top of the configuration hierarchy.
2. Perform the configuration tasks described in [Table 5 on page 30](#).
3. If you are finished configuring the router, commit the configuration.

Table 5: Configuring MD5 RIP Authentication

Task	CLI Configuration Editor
Navigate to Rip level in the configuration hierarchy.	From the [edit] hierarchy level, enter edit protocols rip
Set the authentication type to MD5 .	Set the authentication type to md5 : set authentication-type md5
Set the MD5 authentication key (password). The key can be from 1 through 16 contiguous characters long and can include any ASCII strings.	Set the MD5 authentication key: set authentication-key <i>password</i>

Related Documentation

- [Understanding RIP Authentication on page 29](#)
- [RIP Configuration Overview on page 17](#)
- [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 35](#)

Example: Configuring Authentication for RIP Routes

- [Example: Configuring Route Authentication for RIP on page 30](#)
- [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 35](#)
- [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 36](#)

Example: Configuring Route Authentication for RIP

This example shows how to configure authentication for a RIP network.

- [Requirements on page 31](#)
- [Overview on page 31](#)

- [Configuration on page 31](#)
- [Verification on page 34](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

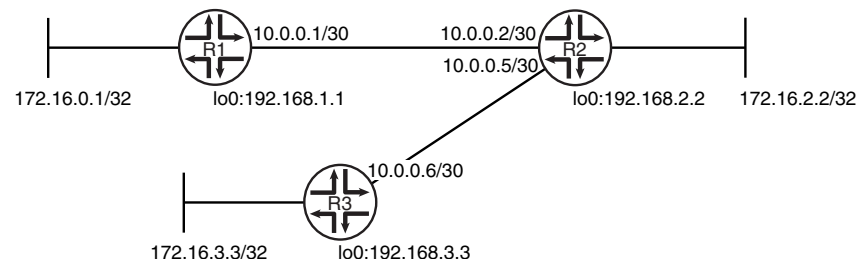
You can configure the router to authenticate RIP route queries. By default, authentication is disabled. You can use one of the following authentication methods:

- Simple authentication—Uses a text password that is included in the transmitted packet. The receiving router uses an authentication key (password) to verify the packet.
- MD5 authentication—Creates an encoded checksum that is included in the transmitted packet. The receiving router uses an authentication key (password) to verify the packet's MD5 checksum.

This example shows MD5 authentication.

[Figure 6 on page 31](#) shows the topology used in this example.

Figure 6: RIP Authentication Network Topology



"[CLI Quick Configuration](#)" on [page 31](#) shows the configuration for all of the devices in [Figure 6 on page 31](#). The section "[Step-by-Step Procedure](#)" on [page 32](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
```

```
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure RIP authentication:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

[edit interfaces]

```
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30
```

```
user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

5. Require MD5 authentication for RIP route queries received on an interface.

The passwords must match on neighboring RIP routers. If the password does not match, the packet is rejected. The password can be from 1 through 16 contiguous characters long and can include any ASCII strings.

Do not enter the password as shown here. The password shown here is the encrypted password that is displayed in the configuration after the actual password is already configured.

```
[edit protocols rip]
user@R1# set authentication-type md5
user@R1# set authentication-key "$ABC123$ABC123"
```

6. Configure tracing operations to track authentication.

```
[edit protocols rip traceoptions]
user@R1# set file rip-authentication-messages
user@R1# set flag auth
user@R1# set flag packets
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  traceoptions {
    file rip-authentication-messages;
    flag auth;
    flag packets;
  }
  authentication-type md5;
  authentication-key $ABC123$ABC123; ## SECRET-DATA
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking for Authentication Failures on page 34](#)
- [Verifying That MD5 Authentication Is Enabled in RIP Update Packets on page 35](#)

Checking for Authentication Failures

Purpose Verify that there are no authentication failures.

Action From operational mode, enter the **show rip statistics** command.

```
user@R1> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter                Total    Last 5 min  Last minute
-----
Updates Sent            2669         10          2
Triggered Updates Sent    2          0          0
Responses Sent           0          0          0
Bad Messages             0          0          0
RIPv1 Updates Received    0          0          0
RIPv1 Bad Route Entries   0          0          0
RIPv1 Updates Ignored     0          0          0
RIPv2 Updates Received   2675        11          2
RIPv2 Bad Route Entries   0          0          0
RIPv2 Updates Ignored     0          0          0
Authentication Failures    0          0          0
RIP Requests Received     0          0          0
RIP Requests Ignored      0          0          0
none                      0          0          0
```

Meaning The output shows that there are no authentication failures.

Verifying That MD5 Authentication Is Enabled in RIP Update Packets

Purpose Use tracing operations to verify that MD5 authentication is enabled in RIP updates.

Action From operational mode, enter the **show log** command.

```
user@R1> show log rip-authentication-messages | match md5
Feb 15 15:45:13.969462      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:45:43.229867      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:46:13.174410      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:46:42.716566      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:47:11.425076      sending msg 0xb9a8c04, 3 rtes (needs MD5)
...
```

Meaning The **(needs MD5)** output shows that all route updates require MD5 authentication.

See Also • [Understanding Basic RIP Routing on page 18](#)

Enabling Authentication with Plain-Text Passwords (CLI Procedure)

To configure authentication that requires a plain-text password to be included in the transmitted packet, enable simple authentication by performing these steps on all RIP devices in the network:

1. Navigate to the top of the configuration hierarchy.
2. Perform the configuration tasks described in [Table 6 on page 36](#).
3. If you are finished configuring the router, commit the configuration.

Table 6: Configuring Simple RIP Authentication

Task	CLI Configuration Editor
Navigate to Rip level in the configuration hierarchy.	From the [edit] hierarchy level, enter edit protocols rip
Set the authentication type to simple .	Set the authentication type to simple : set authentication-type simple
Set the authentication key to a simple-text password. The password can be from 1 through 16 contiguous characters long and can include any ASCII strings.	Set the authentication key to a simple-text password: set authentication-key <i>password</i>

- See Also**
- [Understanding RIP Authentication on page 29](#)
 - [RIP Configuration Overview on page 17](#)
 - [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 30](#)

Enabling Authentication with MD5 Authentication (CLI Procedure)

To configure authentication that requires an MD5 password to be included in the transmitted packet, enable MD5 authentication by performing these steps on all RIP devices in the network:

1. Navigate to the top of the configuration hierarchy.
2. Perform the configuration tasks described in [Table 5 on page 30](#).
3. If you are finished configuring the router, commit the configuration.

Table 7: Configuring MD5 RIP Authentication

Task	CLI Configuration Editor
Navigate to Rip level in the configuration hierarchy.	From the [edit] hierarchy level, enter edit protocols rip

Table 7: Configuring MD5 RIP Authentication (*continued*)

Task	CLI Configuration Editor
Set the authentication type to MD5 .	Set the authentication type to md5 : set authentication-type md5
Set the MD5 authentication key (password). The key can be from 1 through 16 contiguous characters long and can include any ASCII strings.	Set the MD5 authentication key: set authentication-key <i>password</i>

- See Also**
- [Understanding RIP Authentication on page 29](#)
 - [RIP Configuration Overview on page 17](#)
 - [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 35](#)

- Related Documentation**
- [Example: Configuring RIP](#)

Enabling Authentication with Plain-Text Passwords (CLI Procedure)

To configure authentication that requires a plain-text password to be included in the transmitted packet, enable simple authentication by performing these steps on all RIP devices in the network:

1. Navigate to the top of the configuration hierarchy.
2. Perform the configuration tasks described in [Table 6 on page 36](#).
3. If you are finished configuring the router, commit the configuration.

Table 8: Configuring Simple RIP Authentication

Task	CLI Configuration Editor
Navigate to Rip level in the configuration hierarchy.	From the [edit] hierarchy level, enter edit protocols rip
Set the authentication type to simple .	Set the authentication type to simple : set authentication-type simple
Set the authentication key to a simple-text password. The password can be from 1 through 16 contiguous characters long and can include any ASCII strings.	Set the authentication key to a simple-text password: set authentication-key <i>password</i>

Related Documentation

- Understanding RIP Authentication on page 29
- RIP Configuration Overview on page 17
- Enabling Authentication with MD5 Authentication (CLI Procedure) on page 30

Example: Configuring Route Authentication for RIP

This example shows how to configure authentication for a RIP network.

- Requirements on page 38
- Overview on page 38
- Configuration on page 39
- Verification on page 42

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

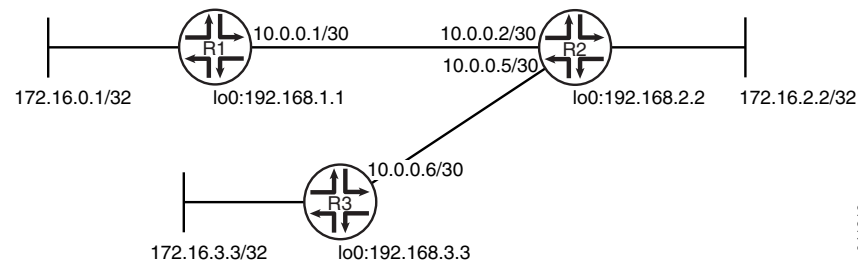
You can configure the router to authenticate RIP route queries. By default, authentication is disabled. You can use one of the following authentication methods:

- **Simple authentication**—Uses a text password that is included in the transmitted packet. The receiving router uses an authentication key (password) to verify the packet.
- **MD5 authentication**—Creates an encoded checksum that is included in the transmitted packet. The receiving router uses an authentication key (password) to verify the packet's MD5 checksum.

This example shows MD5 authentication.

Figure 6 on page 31 shows the topology used in this example.

Figure 7: RIP Authentication Network Topology



“CLI Quick Configuration” on page 31 shows the configuration for all of the devices in Figure 6 on page 31. The section “Step-by-Step Procedure” on page 32 describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set protocols rip authentication-type md5
set protocols rip authentication-key "$ABC123$ABC123"
set protocols rip traceoptions file rip-authentication-messages
set protocols rip traceoptions flag auth
set protocols rip traceoptions flag packets
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
```

```
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

**Step-by-Step
Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure RIP authentication:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

5. Require MD5 authentication for RIP route queries received on an interface.

The passwords must match on neighboring RIP routers. If the password does not match, the packet is rejected. The password can be from 1 through 16 contiguous characters long and can include any ASCII strings.

Do not enter the password as shown here. The password shown here is the encrypted password that is displayed in the configuration after the actual password is already configured.

```
[edit protocols rip]
user@R1# set authentication-type md5
```

```
user@R1# set authentication-key "$ABC123$ABC123"
```

6. Configure tracing operations to track authentication.

```
[edit protocols rip traceoptions]
user@R1# set file rip-authentication-messages
user@R1# set flag auth
user@R1# set flag packets
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  traceoptions {
    file rip-authentication-messages;
    flag auth;
    flag packets;
  }
  authentication-type md5;
  authentication-key $ABC123$ABC123; ## SECRET-DATA
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking for Authentication Failures on page 42](#)
- [Verifying That MD5 Authentication Is Enabled in RIP Update Packets on page 42](#)

Checking for Authentication Failures

Purpose Verify that there are no authentication failures.

Action From operational mode, enter the **show rip statistics** command.

```
user@R1> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter                Total    Last 5 min  Last minute
-----
Updates Sent            2669         10          2
Triggered Updates Sent    2          0          0
Responses Sent           0          0          0
Bad Messages             0          0          0
RIPv1 Updates Received    0          0          0
RIPv1 Bad Route Entries   0          0          0
RIPv1 Updates Ignored     0          0          0
RIPv2 Updates Received   2675        11          2
RIPv2 Bad Route Entries   0          0          0
RIPv2 Updates Ignored     0          0          0
Authentication Failures   0          0          0
RIP Requests Received     0          0          0
RIP Requests Ignored      0          0          0
none                     0          0          0
```

Meaning The output shows that there are no authentication failures.

Verifying That MD5 Authentication Is Enabled in RIP Update Packets

Purpose Use tracing operations to verify that MD5 authentication is enabled in RIP updates.

Action From operational mode, enter the **show log** command.

```
user@R1> show log rip-authentication-messages | match md5
Feb 15 15:45:13.969462      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:45:43.229867      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:46:13.174410      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:46:42.716566      sending msg 0xb9a8c04, 3 rtes (needs MD5)
Feb 15 15:47:11.425076      sending msg 0xb9a8c04, 3 rtes (needs MD5)
...
```

Meaning The **(needs MD5)** output shows that all route updates require MD5 authentication.

Related Documentation

- [Understanding Basic RIP Routing on page 18](#)

CHAPTER 5

Configuring RIP Timers and Demand Circuits

- [Understanding RIP Timers on page 45](#)
- [Example: Configuring RIP Timers on page 46](#)
- [RIP Demand Circuits Overview on page 52](#)
- [Example: Configuring RIP Demand Circuits on page 55](#)

Understanding RIP Timers

RIP uses several timers to regulate its operation.

The update interval is the interval at which routes that are learned by RIP are advertised to neighbors. This timer controls the interval between routing updates. The update interval is set to 30 seconds, by default, with a small random amount of time added when the timer is reset. This added time prevents congestion that can occur if all routing devices update their neighbors simultaneously.

To configure the update time interval, include the **update-interval** statement:

```
update-interval seconds;
```

seconds can be a value from 10 through 60.

You can set a route timeout interval. If a route is not refreshed after being installed in the routing table by the specified time interval, the route is marked as invalid and is removed from the routing table after the hold-down period expires.

To configure the route timeout for RIP, include the **route-timeout** statement:

```
route-timeout seconds;
```

seconds can be a value from 30 through 360. The default value is 180 seconds.

RIP routes expire when either a route timeout limit is met or a route metric reaches infinity, and the route is no longer valid. However, the expired route is retained in the routing table for a specified period so that neighbors can be notified that the route has been dropped. This time period is set by configuring the hold-down timer. Upon expiration of the hold-down timer, the route is removed from the routing table.

To configure the hold-down timer for RIP, include the **holddown** statement:

holddown *seconds*;

seconds can be a value from 10 through 180. The default value is 120 seconds.



NOTE: In Junos OS Release 11.1 and later, a retransmission timer is available for RIP demand circuits.

Generally, we recommend against changing the RIP timers, unless the effects of a change are well understood. The route timeout should be at least three times the update interval. Normally, the default values are best left in effect for standard operations.

Release History Table

Release	Description
11.1	In Junos OS Release 11.1 and later, a retransmission timer is available for RIP demand circuits.

**Related
Documentation**

- [Example: Configuring RIP Timers on page 46](#)
- [Example: Configuring RIP Demand Circuits](#)

Example: Configuring RIP Timers

This example shows how to configure the RIP update interval and how to monitor the impact of the change.

- [Requirements on page 46](#)
- [Overview on page 46](#)
- [Configuration on page 47](#)
- [Verification on page 50](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

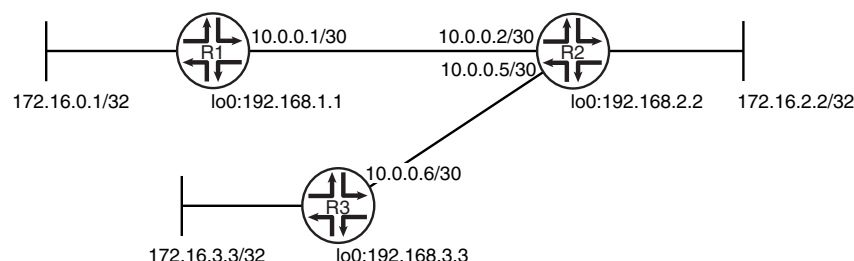
In this example, Device R2 has an update interval of 60 seconds for its neighbor, Device R1, and an update interval of 10 seconds for its neighbor, Device R3.

This example is not necessarily practical, but it is shown for demonstration purposes. Generally, we recommend against changing the RIP timers, unless the effects of a change are well understood. Normally, the default values are best left in effect for standard operations.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIP.

Figure 8 on page 47 shows the topology used in this example.

Figure 8: RIP Timers Network Topology



“CLI Quick Configuration” on page 47 shows the configuration for all of the devices in Figure 8 on page 47. The section “Step-by-Step Procedure” on page 48 describes the steps on Device R2.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```

set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2 update-interval 60
set protocols rip group rip-group neighbor fe-1/2/1.5 update-interval 10
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32

```

```
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

**Step-by-Step
Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the RIP update interval:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R2# set fe-1/2/0 unit 2 family inet address 10.0.0.2/30

user@R2# set fe-1/2/1 unit 5 family inet address 10.0.0.5/30

user@R2# set lo0 unit 2 family inet address 192.168.2.2/32
user@R2# set lo0 unit 2 family inet address 172.16.2.2/32
```

2. Configure different update intervals for the two RIP neighbors.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R2# set neighbor fe-1/2/0.2 update-interval 60
user@R2# set neighbor fe-1/2/1.5 update-interval 10
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R2# set from protocol direct
user@R2# set from protocol rip
user@R2# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R2# set export advertise-routes-through-rip
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the

intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R2# show interfaces
fe-1/2/0 {
  unit 2 {
    family inet {
      address 10.0.0.2/30;
    }
  }
}
fe-1/2/1 {
  unit 5 {
    family inet {
      address 10.0.0.5/30;
    }
  }
}
lo0 {
  unit 2 {
    family inet {
      address 192.168.2.2/32;
      address 172.16.2.2/32;
    }
  }
}

user@R2# show protocols
rip {
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.2 {
      update-interval 60;
    }
    neighbor fe-1/2/1.5 {
      update-interval 10;
    }
  }
}

user@R2# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking the RIP Updates Sent by Device R2 on page 50](#)
- [Checking the RIP Updates Received by Device R2 on page 51](#)
- [Checking the RIP Updates Received by Device R3 on page 51](#)

Checking the RIP Updates Sent by Device R2

Purpose Make sure that the RIP update packets are sent at the expected interval.

Action From operational mode, enter the **show rip statistics** command.

```
user@R2> show rip statistics
```

```
RIPv2 info: port 520; holddown 120s.
```

```
   rts learned   rts held down   rqsts dropped   resps dropped
         4             2             0             0
```

```
fe-1/2/0.2: 2 routes learned; 5 routes advertised; timeout 180s; update interval 60s
```

Counter	Total	Last 5 min	Last minute
Updates Sent	123	5	1
Triggered Updates Sent	0	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	244	10	2
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0
none	0	0	0

```
fe-1/2/1.5: 2 routes learned; 5 routes advertised; timeout 180s; update interval 10s
```

Counter	Total	Last 5 min	Last minute
Updates Sent	734	32	6
Triggered Updates Sent	0	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	245	11	2
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0
none	0	0	0

Meaning The **update interval** field shows that the interval is 60 seconds for Neighbor R1 and 10 seconds for Neighbor R3. The **Updates Sent** field shows that Device R2 is sending updates to Device R1 at roughly 1/6 of the rate that it is sending updates to Device R3.

Checking the RIP Updates Received by Device R2

Purpose Make sure that the RIP update packets are sent at the expected interval.

Action From operational mode, enter the **show rip statistics** command.

```
user@R1> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter                Total    Last 5 min  Last minute
-----
Updates Sent            312         10         2
Triggered Updates Sent    2         0         0
Responses Sent           0         0         0
Bad Messages             0         0         0
RIPv1 Updates Received    0         0         0
RIPv1 Bad Route Entries   0         0         0
RIPv1 Updates Ignored     0         0         0
RIPv2 Updates Received   181         5         1
RIPv2 Bad Route Entries   0         0         0
RIPv2 Updates Ignored     0         0         0
Authentication Failures   0         0         0
RIP Requests Received     1         0         0
RIP Requests Ignored      0         0         0
none                     0         0         0
```

Meaning The **RIPv2 Updates Received** field shows the number of updates received from Device R2.

Checking the RIP Updates Received by Device R3

Purpose Make sure that the RIP update packets are sent at the expected interval.

Action From operational mode, enter the **show rip statistics** command.

```
user@R3> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.6: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
```

Counter	Total	Last 5 min	Last minute
-----	-----	-----	-----
Updates Sent	314	11	2
Triggered Updates Sent	1	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	827	31	6
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0
none	0	0	0

Meaning The **RIPv2 Updates Received** field shows the number of updates received from Device R2.

RIP Demand Circuits Overview

RIP periodically sends routing information (RIP packets) to neighboring devices. These periodic broadcasts can consume bandwidth resources and interfere with network traffic by preventing WAN circuits from being closed. Demand circuits for RIP is defined in RFC 2091 and overcomes these issues by exchanging incremental updates on demand.

A demand circuit is a point-to-point connection between two neighboring interfaces configured for RIP. Demand circuits preserve bandwidth by establishing a link when data needs to be transferred, and terminating the link when the data transfer is complete. Demand circuits increase the efficiency of RIP on the configured interfaces by offering minimal network overhead in terms of messages passed between the demand circuit end points, conserving resources, and reducing costs.

By configuring RIP demand circuits, a specific event triggers the device to send an update, thereby eliminating the periodic transmission of RIP packets over the neighboring interface. To save overhead, the device sends RIP information only when changes occur in the routing database, such as:

- The device is first powered on
- The device receives a request for route update information
- A change occurs in the network
- The demand circuit goes down or comes up

The device sends update requests, update responses, and acknowledgments. In addition, the device retransmits updates and requests until valid acknowledgments are received. The device dynamically learns RIP neighbors. If the neighboring interface goes down, RIP flushes routes learned from the neighbor's IP address.

Routes learned from demand circuits do not age like other RIP entries because demand circuits are in a permanent state. Routes in a permanent state are only removed under the following conditions:

- A formerly reachable route changes to unreachable in an incoming response
- The demand circuit is down due to an excessive number of unacknowledged retransmissions

You can also set the RIP hold-down timer and the RIP demand circuit retransmission timer to regulate performance. The demand circuit uses these timers to determine if there is a change that requires update messages to be sent. There is also a database timer that runs only when RIP flushes learned routes from the routing table.

This topic includes the following sections:

- [RIP Demand Circuit Packets on page 53](#)
- [Timers Used by RIP Demand Circuits on page 54](#)

RIP Demand Circuit Packets

When you configure an interface for RIP demand circuits, the supported command field packet types are different than those for RIP version 1 and RIP version 2. RIP packets for RIP demand circuits contain three additional packet types and an extended 4-byte update header. Both RIP version 1 and RIP version 2 support the three packet types and the extended 4-byte header. [Table 9 on page 53](#) describes the three packet types.

Table 9: RIP Demand Circuit Packet Types

Packet Type	Description
Update Request	Update request messages seek information for the device's routing table. This message is sent when the device is first powered on or when a down demand circuit comes up. The device sends this message every 5 seconds (by default) until an update response message is received.
Update Response	Update response messages are sent in response to an update request message, which occurs when the device is first powered on or when a down demand circuit comes up. Each update response message contains a sequence number that the neighbor uses to acknowledge the update request.
Update Acknowledge	Update acknowledge messages are sent in response to every update response message received by the neighbor.



NOTE: These packets are only valid on interfaces configured for RIP demand circuits. If a demand circuit receives a RIP packet that does not contain these packet types, it silently discards the packet and logs an error message similar to the following:

Ignoring RIP packet with invalid version 0 from neighbor 10.0.0.0 and source 10.0.0.1

- Related Documentation**
- [RIP Packets on page 5](#)
 - [demand-circuit on page 201](#)

Timers Used by RIP Demand Circuits

RIP demand circuits use the RIP hold-down timer and the RIP demand circuit retransmission timer to regulate performance and to determine if there is a change in the network that requires the device to send update messages. The hold-down timer is a global RIP timer that affects the entire RIP configuration; whatever range you configure for RIP applies to RIP demand circuits. The retransmission timer affects only RIP demand circuits. In addition, there is a database timer that runs only when RIP flushes learned routes from the routing table.

- **Hold-down timer (global RIP timer)**—Use the hold-down timer to configure the number of seconds that RIP waits before updating the routing table. The value of the hold-down timer affects the entire RIP configuration, not just the demand circuit interfaces. The hold-down timer starts when a route timeout limit is met, when a formerly reachable route is unreachable, or when a demand circuit interface is down. When the hold-down timer is running, routes are advertised as unreachable on other interfaces. When the hold-down timer expires, the route is removed from the routing table if all destinations are aware that the route is unreachable or the remaining destinations are down. By default, RIP waits 120 seconds between routing table updates. The range is from 10 to 180 seconds.
- **Retransmission timer (RIP demand circuit timer)**—RIP demand circuits send update messages every 5 seconds to an unresponsive peer. Use the retransmission timer to limit the number of times a demand circuit resends update messages to an unresponsive peer. If the configured retransmission threshold is reached, routes from the next hop router are marked as unreachable and the hold-down timer starts. The value of the retransmission timer affects only the demand circuit interfaces. To determine the number of times to resend the update message, use the following calculation:

$$5 \text{ seconds} * \text{number of retransmissions} = \text{retransmission seconds}$$

The retransmission range is from 5 through 180 seconds, which corresponds to sending an update message a minimum of 1 time (5 seconds) and a maximum of 36 times (180 seconds).

- **Database timer (global timeout timer)**—Routes learned from demand circuits do not age like other RIP entries because demand circuits are in a permanent state. On a RIP demand circuit, the database timer starts upon receipt of the update response message

with the flush flag sent from a RIP demand circuit peer. When the neighbor receives this message, all routes from that peer are flushed, and the database timer starts and runs for the configured route timeout interval. When the database timer is running, routes are still advertised as reachable on other interfaces. When the database timer expires, the device advertises all routes from its peer as unreachable.

- Related Documentation**
- [Example: Configuring RIP Timers on page 46](#)
 - [Example: Configuring RIP Demand Circuits on page 55](#)
 - [holddown on page 207](#)
 - [max-retrans-time on page 210](#)

Example: Configuring RIP Demand Circuits

This example describes how to configure an interface as a RIP demand circuit.

- [Requirements on page 55](#)
- [Overview on page 55](#)
- [Configuration on page 56](#)
- [Verification on page 57](#)

Requirements

Before you begin, configure the device interfaces. See the *Junos OS Network Interfaces Library for Routing Devices* or the *Junos OS Interfaces Configuration Guide for Security Devices*.

Overview

A demand circuit is a point-to-point connection between two neighboring interfaces configured for RIP. Demand circuits increase the efficiency of RIP on the configured interfaces by eliminating the periodic transmission of RIP packets. Demand circuits preserve bandwidth by establishing a link when data needs to be transferred, and terminating the link when the data transfer is complete. In this example, two devices are connected using SONET/SDH interfaces.



NOTE: When you configure RIP demand circuits, any silent removal of the RIP configuration goes unnoticed by the RIP peer and leads to stale entries in the routing table. To clear the stale entries, deactivate and reactivate RIP on the neighboring devices.

In this example, you configure interface **so-0/1/0** with the following settings:

- **demand-circuit**—Configures the interface as a demand circuit. To complete the demand circuit, you must configure both ends of the pair as demand circuits.
- **max-retrans-time**—RIP demand circuits send update messages every 5 seconds to an unresponsive peer. Use the retransmission timer to limit the number of times a demand circuit resends update messages to an unresponsive peer. If the configured retransmission threshold is reached, routes from the next-hop router are marked as unreachable, and the hold-down timer starts. The value of the retransmission timer affects only the demand circuit interfaces. To determine the number of times to resend the update message, use the following calculation:

$$5 \text{ seconds} \times \text{retransmissions} = \text{retransmission seconds}$$

For example, if you want the demand circuit to send only two update messages to an unresponsive peer, the calculation is: $5 \times 2 = 10$. When you configure the retransmission timer, you enter 10 seconds.

The retransmission range is from 5 through 180 seconds, which corresponds to sending an update message a minimum of 1 time (5 seconds) and a maximum of 36 times (180 seconds).

Configuration

In the following example, you configure a neighboring interface to be a RIP demand circuit and save the configuration.

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands in the CLI at the **[edit]** hierarchy level.

```
set interfaces so-0/1/0 unit 0 family inet address 192.0.2.0/24
set protocols rip group group1 neighbor so-0/1/0 demand-circuit
set protocols rip group group1 neighbor so-0/1/0 max-retrans-time 10
```

Step-by-Step Procedure

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIP demand circuit on one neighboring interface:

1. Configure the interface.

```
[edit interfaces]
user@host# set so-0/1/0 unit 0 family inet address 192.0.2.0/24
```
2. Configure the neighbor as a demand circuit.

```
[edit protocols rip]
user@host# set group group1 neighbor so-0/1/0 demand-circuit
```
3. Configure the demand circuit retransmission timer.

```
[edit protocols rip]
user@host# set group group1 neighbor so-0/1/0 max-retrans-time 10
```

4. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```



NOTE: Repeat this entire configuration on the other neighboring interface.

Results

Confirm your configuration by entering the **show interfaces** and **show protocols** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show interfaces
so-0/1/0 {
  unit 0 {
    family inet {
      address 192.0.2.0/24;
    }
  }
}

user@host# show protocols
rip {
  group group1 {
    neighbor so-0/1/0 {
      demand-circuit;
      max-retrans-time 10;
    }
  }
}
```

Verification

Confirm that the configuration is working properly.

Verifying a Demand Circuit Configuration

Purpose Verify that the demand circuit configuration is working.

Action To verify that the demand circuit configuration is in effect, use the **show rip neighbor** operational mode command.

```
user@host> show rip neighbor
```

Neighbor	State	Source Address	Destination Address	Send Mode	Receive Mode	In Met
so-0/1/0.0(DC)	Up	10.10.10.2	224.0.0.9	mcast	both	1

When you configure demand circuits, the **show rip neighbor** command displays a DC flag next to the neighboring interface configured for demand circuits.



NOTE: If you configure demand circuits at the [edit protocols rip group *group-name* neighbor *neighbor-name*] hierarchy level, the output shows only the neighboring interface that you specifically configured as a demand circuit. If you configure demand circuits at the [edit protocols rip group *group-name*] hierarchy level, all of the interfaces in the group are configured as demand circuits. Therefore, the output shows all of the interfaces in that group as demand circuits.

Related Documentation

- [RIP Demand Circuits Overview on page 52](#)

CHAPTER 6

Configuring BFD for RIP

- [Understanding BFD for RIP on page 59](#)
- [Example: Configuring BFD for RIP on page 60](#)
- [Understanding BFD Authentication for RIP on page 65](#)
- [Example: Configuring BFD Authentication for RIP on page 67](#)

Understanding BFD for RIP

The Bidirectional Forwarding Detection (BFD) Protocol is a simple hello mechanism that detects failures in a network. Hello packets are sent at a specified, regular interval. A neighbor failure is detected when the routing device stops receiving a reply after a specified interval. BFD works with a wide variety of network environments and topologies. BFD failure detection times are shorter than RIP detection times, providing faster reaction times to various kinds of failures in the network. Instead of waiting for the routing protocol neighbor timeout, BFD provides rapid detection of link failures. BFD timers are adaptive and can be adjusted to be more or less aggressive. For example, a timer can adapt to a higher value if the adjacency fails, or a neighbor can negotiate a higher value for a timer than the one configured. Note that the functionality of configuring BFD for RIP described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

BFD enables quick failover between a primary and a secondary routed path. The protocol tests the operational status of the interface multiple times per second. BFD provides for configuration timers and thresholds for failure detection. For example, if the minimum interval is set for 50 milliseconds and the threshold uses the default value of three missed messages, a failure is detected on an interface within 200 milliseconds of the failure.

Intervening devices (for example, an Ethernet LAN switch) hide link-layer failures from routing protocol peers, such as when two routers are connected by way of a LAN switch, where the local interface status remains up even when a physical fault happens on the remote link. Link-layer failure detection times vary, depending on the physical media and the Layer 2 encapsulation. BFD can provide fast failure detection times for all media types, encapsulations, topologies, and routing protocols.

To enable BFD for RIP, both sides of the connection must receive an update message from the peer. By default, RIP does not export any routes. Therefore, you must enable update messages to be sent by configuring an export policy for routes before a BFD session is triggered.

Release History Table

Release	Description
15.1X49	Note that the functionality of configuring BFD for RIP described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Configuring BFD for RIP on page 60](#)

Example: Configuring BFD for RIP

This example shows how to configure Bidirectional Forwarding Detection (BFD) for a RIP network.

- [Requirements on page 60](#)
- [Overview on page 60](#)
- [Configuration on page 62](#)
- [Verification on page 64](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

To enable failure detection, include the **bfd-liveness-detection** statement:

```

bfd-liveness-detection {
  detection-time {
    threshold milliseconds;
  }
  minimum-interval milliseconds;
  minimum-receive-interval milliseconds;
  multiplier number;
  no-adaptation;
  transmit-interval {
    threshold milliseconds;
    minimum-interval milliseconds;
  }
  version (1 | automatic);
}

```

Optionally, you can specify the threshold for the adaptation of the detection time by including the **threshold** statement. When the BFD session detection time adapts to a value equal to or greater than the threshold, a single trap and a system log message are sent.

To specify the minimum transmit and receive interval for failure detection, include the **minimum-interval** statement. This value represents the minimum interval at which the local routing device transmits hello packets as well as the minimum interval at which

the routing device expects to receive a reply from a neighbor with which it has established a BFD session. You can configure a value in the range from 1 through 255,000 milliseconds. This examples sets a minimum interval of 600 milliseconds.



NOTE: BFD is an intensive protocol that consumes system resources. Specifying a minimum interval for BFD of less than 100 ms for Routing Engine-based sessions and 10 ms for distributed BFD sessions can cause undesired BFD flapping.

Depending on your network environment, these additional recommendations might apply:

- For large-scale network deployments with a large number of BFD sessions, specify a minimum interval of 300 ms for Routing Engine-based sessions and 100 ms for distributed BFD sessions.
- For very large-scale network deployments with a large number of BFD sessions, contact Juniper Networks customer support for more information.
- For BFD sessions to remain up during a Routing Engine switchover event when nonstop active routing (NSR) is configured, specify a minimum interval of 2500 ms for Routing Engine-based sessions. For distributed BFD sessions with nonstop active routing configured, the minimum interval recommendations are unchanged and depend only on your network deployment.

You can optionally specify the minimum transmit and receive intervals separately.

To specify only the minimum receive interval for failure detection, include the **minimum-receive-interval** statement. This value represents the minimum interval at which the local routing device expects to receive a reply from a neighbor with which it has established a BFD session. You can configure a value in the range from 1 through 255,00 milliseconds.

To specify only the minimum transmit interval for failure detection, include the **transmit-interval minimum-interval** statement. This value represents the minimum interval at which the local routing device transmits hello packets to the neighbor with which it has established a BFD session. You can configure a value in the range from 1 through 255,000 milliseconds.

To specify the number of hello packets not received by a neighbor that causes the originating interface to be declared down, include the **multiplier** statement. The default is 3, and you can configure a value in the range from 1 through 255.

To specify the threshold for detecting the adaptation of the transmit interval, include the **transmit-interval threshold** statement. The threshold value must be greater than the transmit interval.

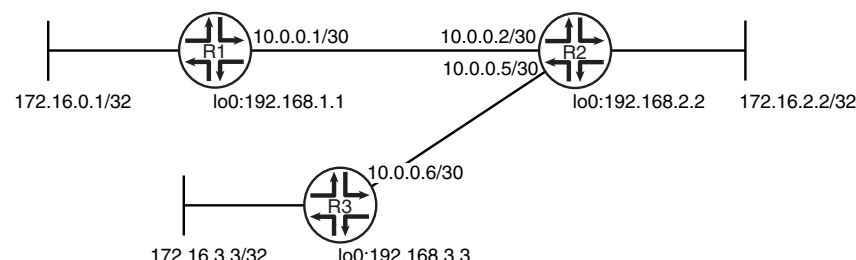
To specify the BFD version used for detection, include the **version** statement. The default is to have the version detected automatically.

You can trace BFD operations by including the **traceoptions** statement at the **[edit protocols bfd]** hierarchy level.

In Junos OS Release 9.0 and later, you can configure BFD sessions not to adapt to changing network conditions. To disable BFD adaptation, include the **no-adaptation** statement. We recommend that you not disable BFD adaptation unless it is preferable not to have BFD adaptation enabled in your network.

Figure 9 on page 62 shows the topology used in this example.

Figure 9: RIP BFD Network Topology



"CLI Quick Configuration" on page 62 shows the configuration for all of the devices in Figure 9 on page 62. The section "Step-by-Step Procedure" on page 63 describes the steps on Device R1.

Configuration

CLI Quick Configuration	To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit] hierarchy level.
Device R1	<pre> set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30 set protocols bfd traceoptions file bfd-trace set protocols bfd traceoptions flag all set protocols rip group rip-group export advertise-routes-through-rip set protocols rip group rip-group neighbor fe-1/2/0.1 set protocols rip group rip-group bfd-liveness-detection minimum-interval 600 set policy-options policy-statement advertise-routes-through-rip term 1 from protocol direct set policy-options policy-statement advertise-routes-through-rip term 1 from protocol rip set policy-options policy-statement advertise-routes-through-rip term 1 then accept </pre>
Device R2	<pre> set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30 set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30 set protocols rip group rip-group export advertise-routes-through-rip set protocols rip group rip-group neighbor fe-1/2/0.2 set protocols rip group rip-group neighbor fe-1/2/1.5 set protocols rip group rip-group bfd-liveness-detection minimum-interval 600 set policy-options policy-statement advertise-routes-through-rip term 1 from protocol direct </pre>

```

set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set protocols rip group rip-group bfd-liveness-detection minimum-interval 600
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a BFD for a RIP network:

1. Configure the network interfaces.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```

[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1

```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```

[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept

```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```

[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip

```

5. Enable BFD.

```

[edit protocols rip group rip-group]
user@R1# set bfd-liveness-detection minimum-interval 600

```

6. Configure tracing operations to track BFD messages.

```
[edit protocols bfd traceoptions]
user@R1# set file bfd-trace
user@R1# set flag all
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}

user@R1# show protocols
bfd {
  traceoptions {
    file bfd-trace;
    flag all;
  }
}
rip {
  group rip-group {
    export advertise-routes-through-rip;
    bfd-liveness-detection {
      minimum-interval 600;
    }
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Verifying That the BFD Sessions Are Up on page 65](#)
- [Checking the BFD Trace File on page 65](#)

Verifying That the BFD Sessions Are Up

Purpose Make sure that the BFD sessions are operating.

Action From operational mode, enter the **show bfd session** command.

```
user@R1> show bfd session
```

Address	State	Interface	Detect Time	Transmit Interval	Multiplier
10.0.0.2	Up	fe-1/2/0.1	1.800	0.600	3

1 sessions, 1 clients
Cumulative transmit rate 1.7 pps, cumulative receive rate 1.7 pps

Meaning The output shows that there are no authentication failures.

Checking the BFD Trace File

Purpose Use tracing operations to verify that BFD packets are being exchanged.

Action From operational mode, enter the **show log** command.

```
user@R1> show log bfd-trace
Feb 16 10:26:32 PPM Trace: BFD periodic xmit to 10.0.0.2 (IFL 124, rtbl 53,
single-hop port)
Feb 16 10:26:32 Received Downstream TraceMsg (24) len 86:
Feb 16 10:26:32   IfIndex (3) len 4: 0
Feb 16 10:26:32   Protocol (1) len 1: BFD
Feb 16 10:26:32   Data (9) len 61: (hex) 42 46 44 20 70 61 63 6b 65 74 20 66 72
6f 6d 20 31 30 2e
Feb 16 10:26:32 PPM Trace: BFD packet from 10.0.0.1 (IFL 73, rtbl 56, ttl 255)
absorbed
Feb 16 10:26:32 Received Downstream TraceMsg (24) len 60:
Feb 16 10:26:32   IfIndex (3) len 4: 0
Feb 16 10:26:32   Protocol (1) len 1: BFD
Feb 16 10:26:32   Data (9) len 35: (hex) 42 46 44 20 70 65 72 69 6f 64 69 63 20
78 6d 69 74 20 6f
...
```

Meaning The output shows the normal functioning of BFD.

Related Documentation

- [Understanding BFD for RIP on page 59](#)

Understanding BFD Authentication for RIP

BFD enables rapid detection of communication failures between adjacent systems. By default, authentication for BFD sessions is disabled. However, when running BFD over

Network Layer protocols, the risk of service attacks can be significant. We strongly recommend using authentication if you are running BFD over multiple hops or through insecure tunnels. Beginning with Junos OS Release 9.6, Junos OS supports authentication for BFD sessions running over RIP. BFD authentication is only supported in the domestic image and is not available in the export image.

You authenticate BFD sessions by specifying an authentication algorithm and keychain, and then associating that configuration information with a security authentication keychain using the keychain name.

The following sections describe the supported authentication algorithms, security keychains, and the level of authentication that can be configured:

- [BFD Authentication Algorithms on page 66](#)
- [Security Authentication Keychains on page 67](#)
- [Strict Versus Loose Authentication on page 67](#)

BFD Authentication Algorithms

Junos OS supports the following algorithms for BFD authentication:

- **simple-password**—Plain-text password. One to 16 bytes of plain text are used to authenticate the BFD session. One or more passwords can be configured. This method is the least secure and should be used only when BFD sessions are not subject to packet interception.
- **keyed-md5**—Keyed Message Digest 5 hash algorithm for sessions with transmit and receive intervals greater than 100 ms. To authenticate the BFD session, keyed MD5 uses one or more secret keys (generated by the algorithm) and a sequence number that is updated periodically. With this method, packets are accepted at the receiving end of the session if one of the keys matches and the sequence number is greater than or equal to the last sequence number received. Although more secure than a simple password, this method is vulnerable to replay attacks. Increasing the rate at which the sequence number is updated can reduce this risk.
- **meticulous-keyed-md5**—Meticulous keyed Message Digest 5 hash algorithm. This method works in the same manner as keyed MD5, but the sequence number is updated with every packet. Although more secure than keyed MD5 and simple passwords, this method might take additional time to authenticate the session.
- **keyed-sha-1**—Keyed Secure Hash Algorithm I for sessions with transmit and receive intervals greater than 100 ms. To authenticate the BFD session, keyed SHA uses one or more secret keys (generated by the algorithm) and a sequence number that is updated periodically. The key is not carried within the packets. With this method, packets are accepted at the receiving end of the session if one of the keys matches and the sequence number is greater than the last sequence number received.
- **meticulous-keyed-sha-1**—Meticulous keyed Secure Hash Algorithm I. This method works in the same manner as keyed SHA, but the sequence number is updated with every packet. Although more secure than keyed SHA and simple passwords, this method might take additional time to authenticate the session.



NOTE: Nonstop active routing is not supported with meticulous-keyed-md5 and meticulous-keyed-sha-1 authentication algorithms. BFD sessions using these algorithms might go down after a switchover.

Security Authentication Keychains

The security authentication keychain defines the authentication attributes used for authentication key updates. When the security authentication keychain is configured and associated with a protocol through the keychain name, authentication key updates can occur without interrupting routing and signaling protocols.

The authentication keychain contains one or more keychains. Each keychain contains one or more keys. Each key holds the secret data and the time at which the key becomes valid. The algorithm and keychain must be configured on both ends of the BFD session, and they must match. Any mismatch in configuration prevents the BFD session from being created.

BFD allows multiple clients per session, and each client can have its own keychain and algorithm defined. To avoid confusion, we recommend specifying only one security authentication keychain.

Strict Versus Loose Authentication

By default, strict authentication is enabled and authentication is checked at both ends of each BFD session. Optionally, to smooth migration from nonauthenticated sessions to authenticated sessions, you can configure *loose checking*. When loose checking is configured, packets are accepted without authentication being checked at each end of the session. This feature is intended for transitional periods only.

Related Documentation

- [Example: Configuring BFD Authentication for RIP on page 67](#)
- [bfd-liveness-detection on page 197](#)
- **authentication-key-chains** statement in the *Junos OS Administration Library*
- **show bfd session** command in the [CLI Explorer](#)
- [Example: Configuring BFD for RIP on page 60](#)

Example: Configuring BFD Authentication for RIP

This example shows how to configure Bidirectional Forwarding Detection (BFD) authentication for a RIP network.

- [Requirements on page 68](#)
- [Overview on page 68](#)
- [Configuration on page 68](#)
- [Verification on page 72](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

The devices must be running Junos OS Release 9.6 or later.

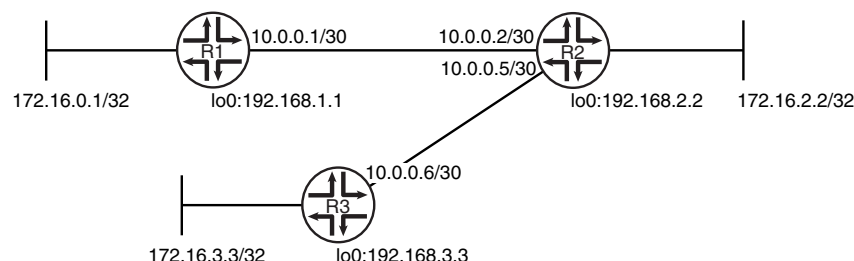
Overview

Only three steps are needed to configure authentication on a BFD session:

1. Specify the BFD authentication algorithm for the RIP protocol.
2. Associate the authentication keychain with the RIP protocol.
3. Configure the related security authentication keychain.

Figure 10 on page 68 shows the topology used in this example.

Figure 10: RIP BFD Authentication Network Topology



"CLI Quick Configuration" on page 68 shows the configuration for all of the devices in Figure 10 on page 68. The section "Step-by-Step Procedure" on page 69 describes the steps on Device R1.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set protocols bfd traceoptions file bfd-trace
set protocols bfd traceoptions flag all
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set protocols rip group rip-group bfd-liveness-detection minimum-interval 600
set protocols rip group rip-group bfd-liveness-detection authentication key-chain bfd-rip
set protocols rip group rip-group bfd-liveness-detection authentication algorithm
  keyed-md5
set protocols rip group rip-group bfd-liveness-detection authentication loose-check
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
```



```

set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
set security authentication-key-chains key-chain bfd-rip key 53 secret $ABC123$ABC123
set security authentication-key-chains key-chain bfd-rip key 53 start-time
  "2012-2-16.12:00:00 -0800"

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set protocols rip group rip-group bfd-liveness-detection minimum-interval 600
set protocols rip group rip-group bfd-liveness-detection authentication key-chain bfd-rip
set protocols rip group rip-group bfd-liveness-detection authentication algorithm
  keyed-md5
set protocols rip group rip-group bfd-liveness-detection authentication loose-check
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
set security authentication-key-chains key-chain bfd-rip key 53 secret $ABC123$ABC123
set security authentication-key-chains key-chain bfd-rip key 53 start-time
  "2012-2-16.12:00:00 -0800"

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set protocols rip group rip-group bfd-liveness-detection minimum-interval 600
set protocols rip group rip-group bfd-liveness-detection authentication key-chain bfd-rip
set protocols rip group rip-group bfd-liveness-detection authentication algorithm
  keyed-md5
set protocols rip group rip-group bfd-liveness-detection authentication loose-check
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
set security authentication-key-chains key-chain bfd-rip key 53 secret $ABC123$ABC123
set security authentication-key-chains key-chain bfd-rip key 53 start-time
  "2012-2-16.12:00:00 -0800"

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a BFD authentication:

1. Configure the network interfaces.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

5. Enable BFD.

```
[edit protocols rip group rip-group]
user@R1# set bfd-liveness-detection minimum-interval 600
```

6. Specify the algorithm (**keyed-md5**, **keyed-sha-1**, **meticulous-keyed-md5**, **meticulous-keyed-sha-1**, or **simple-password**) to use.



NOTE: Nonstop active routing is not supported with meticulous-keyed-md5 and meticulous-keyed-sha-1 authentication algorithms. BFD sessions using these algorithms might go down after a switchover.

```
[edit protocols rip group rip-group]
user@R1# set bfd-liveness-detection authentication algorithm keyed-md5
```

7. Specify the keychain to be used to associate BFD sessions on RIP with the unique security authentication keychain attributes.

The keychain you specify must match a keychain name configured at the **[edit security authentication key-chains]** hierarchy level.

The algorithm and keychain must be configured on both ends of the BFD session, and they must match. Any mismatch in configuration prevents the BFD session from being created.

```
[edit protocols rip group rip-group]
user@R1# set bfd-liveness-detection authentication key-chain bfd-rip
```

8. (Optional) Specify loose authentication checking if you are transitioning from nonauthenticated sessions to authenticated sessions.

```
[edit protocols rip group rip-group]
user@R1# set bfd-liveness-detection authentication loose-check
```

9. Specify the unique security authentication information for BFD sessions:

- The matching keychain name as specified in Step 7.
- At least one key, a unique integer between 0 and 63. Creating multiple keys allows multiple clients to use the BFD session.
- The secret data used to allow access to the session.
- The time at which the authentication key becomes active, in the format *yyyy-mm-dd.hh:mm:ss*.

```
[edit security authentication-key-chains key-chain bfd-rip]
user@R1# set key 53 secret $ABC123$ABC123
user@R1# set key 53 start-time "2012-2-16.12:00:00 -0800"
```

10. Configure tracing operations to track BFD authentication.

```
[edit protocols bfd traceoptions]
user@R1# set file bfd-trace
user@R1# set flag all
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, **show policy-options**, and **show security** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}

user@R1# show protocols
bfd {
  traceoptions {
    file bfd-trace;
    flag all;
  }
}
rip {
  group rip-group {
    export advertise-routes-through-rip;
    bfd-liveness-detection {
      minimum-interval 600;
    }
  }
}
```

```

    }
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}

user@R1# show security
authentication-key-chains {
  key-chain bfd-rip {
    key 53 {
      secret $ABC123$ABC123
      start-time "2012-2-16.12:00:00 -0800";
    }
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Verifying That the BFD Sessions Are Authenticated on page 72](#)
- [Viewing Extensive Information About the BFD Authentication on page 73](#)
- [Checking the BFD Trace File on page 73](#)

Verifying That the BFD Sessions Are Authenticated

Purpose Make sure that the BFD sessions are authenticated.

Action From operational mode, enter the **show bfd session detail** command.

```

user@R1> show bfd session detail

```

Address	State	Interface	Detect Time	Transmit Interval	Multiplier
10.0.0.2	Up	fe-1/2/0.1	1.800	0.600	3

```

Client RIP, TX interval 0.600, RX interval 0.600, Authenticate
Session up time 01:39:34
Local diagnostic None, remote diagnostic None
Remote state Up, version 1
Logical system 6, routing table index 53

1 sessions, 1 clients
Cumulative transmit rate 1.7 pps, cumulative receive rate 1.7 pps

```

Meaning **Authenticate** is displayed to indicate that BFD authentication is configured.

Viewing Extensive Information About the BFD Authentication

Purpose View the keychain name, the authentication algorithm and mode for each client in the session, and the BFD authentication configuration status.

Action From operational mode, enter the **show bfd session extensive** command.

```
user@R1> show bfd session extensive
```

Address	State	Interface	Detect Time	Transmit Interval	Multiplier
10.0.0.2	Up	fe-1/2/0.1	1.800	0.600	3

Client RIP, TX interval 0.600, RX interval 0.600, Authenticate
keychain bfd-rip, algo keyed-md5, mode loose
Session up time 01:46:29
Local diagnostic None, remote diagnostic None
Remote state Up, version 1
Logical system 6, routing table index 53
Min async interval 0.600, min slow interval 1.000
Adaptive async TX interval 0.600, RX interval 0.600
Local min TX interval 0.600, minimum RX interval 0.600, multiplier 3
Remote min TX interval 0.600, min RX interval 0.600, multiplier 3
Local discriminator 225, remote discriminator 226
Echo mode disabled/inactive
Authentication enabled/active, keychain bfd-rip, algo keyed-md5, mode loose
Session ID: 0x300501

1 sessions, 1 clients
Cumulative transmit rate 1.7 pps, cumulative receive rate 1.7 pps

Meaning The output shows the keychain name, the authentication algorithm and mode for the client in the session, and the BFD authentication configuration status.

Checking the BFD Trace File

Purpose Use tracing operations to verify that BFD packets are being exchanged.

Action From operational mode, enter the **show log** command.

```
user@R1> show log bfd-trace
Feb 16 10:26:32 PPM Trace: BFD periodic xmit to 10.0.0.2 (IFL 124, rtbl 53,
single-hop port)
Feb 16 10:26:32 Received Downstream TraceMsg (24) len 86:
Feb 16 10:26:32   IfIndex (3) len 4: 0
Feb 16 10:26:32   Protocol (1) len 1: BFD
Feb 16 10:26:32   Data (9) len 61: (hex) 42 46 44 20 70 61 63 6b 65 74 20 66 72
6f 6d 20 31 30 2e
Feb 16 10:26:32 PPM Trace: BFD packet from 10.0.0.1 (IFL 73, rtbl 56, ttl 255)
absorbed
Feb 16 10:26:32 Received Downstream TraceMsg (24) len 60:
Feb 16 10:26:32   IfIndex (3) len 4: 0
Feb 16 10:26:32   Protocol (1) len 1: BFD
Feb 16 10:26:32   Data (9) len 35: (hex) 42 46 44 20 70 65 72 69 6f 64 69 63 20
```

```
78 6d 69 74 20 6f
...
```

Meaning The output shows the normal functioning of BFD.

Related Documentation

- [Understanding BFD Authentication for RIP on page 65](#)

CHAPTER 7

Using Metrics to Control Traffic in a RIP Network

- [Understanding Traffic Control with Metrics in a RIP Network on page 75](#)
- [Example: Controlling Traffic in a RIP Network with an Incoming Metric on page 76](#)
- [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 78](#)
- [Example: Configuring the Metric Value Added to Imported RIP Routes on page 80](#)

Understanding Traffic Control with Metrics in a RIP Network

To tune a RIP network and control traffic flowing through the network, you increase or decrease the cost of the paths through the network. RIP provides two ways to modify the path cost: an incoming metric and an outgoing metric, which are each set to 1 by default. These metrics are attributes that manually specify the cost of any route advertised through a host. By increasing or decreasing the metrics—and thus the cost—of links throughout the network, you can control packet transmission across the network.

The incoming metric modifies the cost of an individual segment when a route across the segment is imported into the routing table. For example, if you set the incoming metric on the segment to 3, the individual segment cost along the link is changed from 1 to 3. The increased cost affects all route calculations through that link. Other routes that were previously excluded because of a high hop count might now be selected into the router's forwarding table.

The outgoing metric modifies the path cost for all the routes advertised out a particular interface. Unlike the incoming metric, the outgoing metric modifies the routes that other routers are learning and thereby controls the way they send traffic.

If an exported route was learned from a member of the same RIP group, the metric associated with that route is the normal RIP metric. For example, a RIP route with a metric of 5 learned from a neighbor configured with an incoming metric of 2 is advertised with a combined metric of 7 when advertised to neighbors in the same group. However, if this route was learned from a RIP neighbor in a different group or from a different protocol, the route is advertised with the metric value configured in the outgoing metric for that group.

You might want to increase the metric of routes to decrease the likelihood that a particular route is selected and installed in the routing table. This process is sometimes referred to

as *route poisoning*. Some reasons that you might want to poison a route are that the route is relatively expensive to use, or it has relatively low bandwidth.

A route with a higher metric than another route becomes the active route only when the lower-metric route becomes unavailable. In this way, the higher-metric route serves as a backup path.

One way to increase the metric of imported routes is to configure an import policy. Another way is to include the **metric-in** statement in the RIP neighbor configuration. One way to increase the metric of export routes is to configure an export policy. Another way is to include the **metric-out** statement in the RIP neighbor configuration.

Related Documentation

- [RIP Overview on page 3](#)
- [Example: Controlling Traffic in a RIP Network with an Incoming Metric on page 76](#)
- [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 78](#)

Example: Controlling Traffic in a RIP Network with an Incoming Metric

This example shows how to control traffic with an incoming metric.

- [Requirements on page 76](#)
- [Overview on page 76](#)
- [Configuration on page 77](#)
- [Verification on page 77](#)

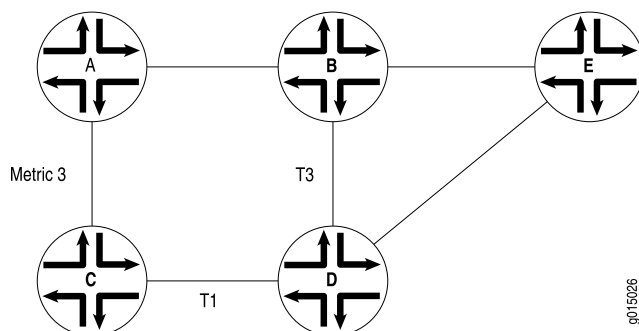
Requirements

Before you begin, define RIP groups, and add interfaces to the groups. Then configure a routing policy to export directly connected routes and routes learned through the RIP routing exchanges. See “[Example: Configuring a Basic RIP Network](#)” on page 18.

Overview

In this example, routes to Router D are received by Router A across both of its RIP-enabled interfaces as shown in [Figure 11 on page 77](#). Because the route through Router B and the route through Router C have the same number of hops, both routes are imported into the forwarding table. However, because the T3 link from Router B to Router D has a higher bandwidth than the T1 link from Router C to Router D, you want traffic to flow from Router A through Router B to Router D.

Figure 11: Controlling Traffic in a RIP Network with the Incoming Metric



To force this flow, you can modify the route metrics as they are imported into Router A's routing table. By setting the incoming metric on the interface from Router A to Router C, you modify the metric on all routes received through that interface. Setting the incoming route metric on Router A changes only the routes in Router A's routing table, and affects only how Router A sends traffic to Router D. Router D's route selection is based on its own routing table, which, by default, includes no adjusted metric values.

In the example, Router C receives a route advertisement from Router D and readvertises the route to Router A. When Router A receives the route, it applies the incoming metric on the interface. Instead of incrementing the metric by 1 (the default), Router A increments it by 3 (the configured incoming metric), giving the route from Router A to Router D through Router C a total path metric of 4. Because the route through Router B has a metric of 2, it becomes the preferred route for all traffic from Router A to Router D.

This example uses a RIP group called **alpha 1** on interface **g3-0/0/0**.

Configuration

Step-by-Step Procedure

To control traffic with an incoming metric:

1. Enable RIP on the interface.

```
[edit protocols rip]
user@host# set group alpha1 neighbor ge-0/0/0
```
2. Set the incoming metric.

```
[edit protocols rip]
user@host# set metric-in 3
```
3. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Verification

To verify that the configuration is working properly, enter the **show route protocols rip** command.

- Related Documentation**
- [Understanding Traffic Control with Metrics in a RIP Network on page 75](#)
 - [RIP Configuration Overview on page 17](#)
 - [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 78](#)
 - [Verifying a RIP Configuration on page 188](#)

Example: Controlling Traffic in a RIP Network with an Outgoing Metric

This example shows how to control traffic with an outgoing metric.

- [Requirements on page 78](#)
- [Overview on page 78](#)
- [Configuration on page 79](#)
- [Verification on page 79](#)

Requirements

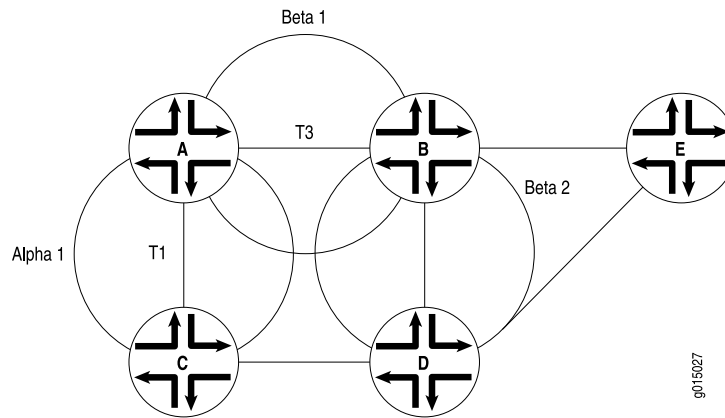
Before you begin:

- Define RIP groups, and add interfaces to the groups. Then configure a routing policy to export directly connected routes and routes learned through RIP routing exchanges. See [“Example: Configuring a Basic RIP Network” on page 18](#).
- Control traffic with an incoming metric. See [“Example: Controlling Traffic in a RIP Network with an Incoming Metric” on page 76](#).

Overview

In this example, each route from Router A to Router D has two hops as shown in [Figure 12 on page 79](#). However, because the link from Router A to Router B in the RIP group has a higher bandwidth than the link from Router A to Router C in RIP group Alpha 1, you want traffic from Router D to Router A to flow through Router B. To control the way Router D sends traffic to Router A, you can alter the routes that Router D receives by configuring the outgoing metric on Router A's interfaces in the Alpha 1 RIP group.

Figure 12: Controlling Traffic in a RIP Network with the Outgoing Metric



If the outgoing metric for the Alpha 1 RIP group—the A-to-C link—is changed to 3, Router D calculates the total path metric from Router A through Router C as 4. In contrast, the unchanged default total path metric to Router A through Router B in the RIP group is 2. The fact that Router A's interfaces belong to two different RIP groups allows you to configure two different outgoing metrics on its interfaces, because you configure path metrics at the group level.

By configuring the outgoing metric, you control the way Router A sends traffic to Router D. By configuring the outgoing metric on the same router, you control the way Router D sends traffic to Router A.

This example uses an outgoing metric of 3.

Configuration

Step-by-Step Procedure

To control traffic with an outgoing metric:

1. Set the outgoing metric.


```
[edit protocols rip group alpha1]
user@host# set metric-out 3
```
2. If you are done configuring the device, commit the configuration.


```
[edit]
user@host# commit
```

Verification

To verify that the configuration is working properly, enter the **show protocols rip** command.

Related Documentation

- [Understanding Traffic Control with Metrics in a RIP Network on page 75](#)
- [RIP Configuration Overview on page 17](#)
- [Verifying a RIP Configuration on page 188](#)

Example: Configuring the Metric Value Added to Imported RIP Routes

This example shows how to change the default metric to be added to incoming routes to control the route selection process.

- [Requirements on page 80](#)
- [Overview on page 80](#)
- [Configuration on page 80](#)
- [Verification on page 83](#)

Requirements

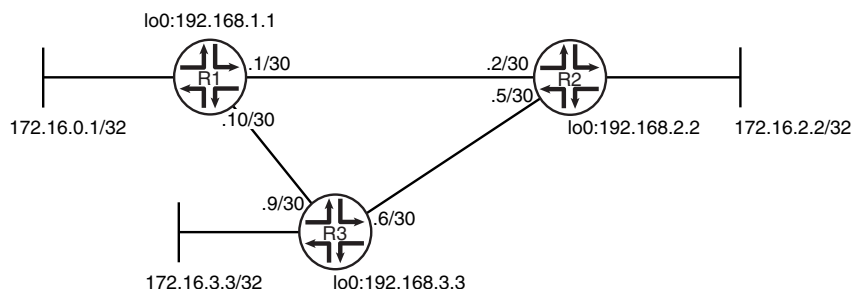
No special configuration beyond device initialization is required before configuring this example.

Overview

Normally, when multiple routes are available, RIP selects the route with the lowest hop count. Changing the default metric enables you to control the route selection process such that a route with a higher hop count can be preferred over of a route with a lower hop count.

[Figure 13 on page 80](#) shows the topology used in this example.

Figure 13: RIP Incoming Metrics Network Topology



Device R1 has two potential paths to reach 172.16.2.2/32. The default behavior is to send traffic out the 0.1/30 interface facing Device R2. Suppose, though, that the path through Device R3 is less expensive to use or has higher bandwidth links. This example shows how to use the **metric-in** statement to ensure that Device R1 uses the path through Device R3 to reach 172.16.2.2/32. “[CLI Quick Configuration](#)” on [page 80](#) shows the configuration for all of the devices in [Figure 13 on page 80](#). The section “[Step-by-Step Procedure](#)” on [page 81](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```

set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces ge-1/2/1 unit 10 description to-R3
set interfaces ge-1/2/1 unit 10 family inet address 10.0.0.10/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group primary export advertise-routes-through-rip
set protocols rip group primary neighbor ge-1/2/1.10
set protocols rip group secondary export advertise-routes-through-rip
set protocols rip group secondary neighbor fe-1/2/0.1 metric-in 4
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces ge-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor ge-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces ge-1/2/1 unit 9 family inet address 10.0.0.9/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set protocols rip group rip-group neighbor ge-1/2/1.9
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIP metrics:

1. Configure the network interfaces.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

```

```
user@R1# set ge-1/2/1 unit 10 description to-R3
user@R1# set ge-1/2/1 unit 10 family inet address 10.0.0.10/30
```

```
user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Create the RIP groups and add the interfaces.

To configure RIP in Junos OS, you must configure one or more groups that contain the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

For the interface that is facing Device R2, the **metric-in 4** setting causes this route to be less likely to be chosen as the active route.

```
[edit protocols rip]
user@R1# set group primary neighbor ge-1/2/1.10
user@R1# set group secondary neighbor fe-1/2/0.1 metric-in 4
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip]
user@R1# set group primary export advertise-routes-through-rip
user@R1# set group secondary export advertise-routes-through-rip
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet {
      address 10.0.0.1/30;
    }
  }
}
ge-1/2/1 {
  unit 10 {
    description to-R3;
    family inet {
      address 10.0.0.10/30;
```

```

    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  group primary {
    export advertise-routes-through-rip;
    neighbor ge-1/2/1.10;
  }
  group secondary {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1 {
      metric-in 4;
    }
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Verifying That the Expected Route Is Active on page 83](#)
- [Removing the metric-in Statement on page 84](#)

Verifying That the Expected Route Is Active

Purpose Make sure that to reach 172.16.2.2/32, Device R1 uses the path through Device R3.

Action From operational mode, enter the **show route 172.16.2.2** command.

```

user@R1> show route 172.16.2.2
inet.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.2.2/32      *[RIP/100] 00:15:46, metric 3, tag 0
                  > to 10.0.0.9 via ge-1/2/1.10

```

Meaning The `to 10.0.0.9 via ge-1/2/1.10` output shows that Device R1 uses the path through Device R3 to reach 172.16.2.2/32. The metric for this route is 3.

Removing the metric-in Statement

Purpose Delete or deactivate the `metric-in` statement to see what happens to the 172.16.2.2/32 route.

Action 1. From configuration mode, deactivate the `metric-in` statement.

```
[edit protocols rip group secondary neighbor fe-1/2/0.1]
user@R1# deactivate metric-in
user@R1# commit
```

2. From operational mode, enter the `show route 172.16.2.2` command.

```
user@R1> show route 172.16.2.2
inet.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.2.2/32      *[RIP/100] 00:00:06, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
```

Meaning The `to 10.0.0.2 via fe-1/2/0.1` output shows that Device R1 uses the path through Device R2 to reach 172.16.2.2/32. The metric for this route is 2.

Related Documentation

- [Understanding Traffic Control with Metrics in a RIP Network on page 75](#)

CHAPTER 8

Configuring Point-to-Multipoint RIP Networks

- [Configuring Point-to-Multipoint RIP Networks Overview on page 85](#)
- [Example: Configuring Point-to-Multipoint RIP Networks on page 86](#)

Configuring Point-to-Multipoint RIP Networks Overview

A point-to-multipoint RIP network consists of a device having two or more peers on a single interface. All the devices forming a point-to-multipoint connection are placed in a single broadcast domain.

In a RIP network, a device can have a single peer or multiple peers for an interface. However, the demand circuit feature implementation in a RIP network requires the use of a single RIP peer. When you configure the following statements, a RIP network with demand circuits can also be configured to have multiple peers on an interface:

- Configuring the interface type to be a multipoint interface by using the [interface-type \(Protocols RIP\) p2mp](#) statement.
- Enabling dynamic peer discovery by using the [dynamic-peers](#) statement (SRX Series devices only).



NOTE: Before configuring the [dynamic-peers](#) statement, IPsec must be configured and IPsec tunnels must be set up by configuring IPsec parameters. Without IPsec configuration, the remote peers have to be explicitly configured at the RIP protocol level by using the [peer address](#) statement. See *Configuring Security Associations for IPsec on an ES PIC* for more details.

- Configuring peers by using the [peer address](#) statement.

```
[edit]
protocols {
  rip {
    group red {
      neighbor fe-0/1/3 {
        interface-type \(Protocols RIP\) p2mp;
        peer address; (or use dynamic-peers;)
      }
    }
  }
}
```

```
    }  
  }  
}
```

The `show rip statistics peer address` command can be used to display the RIP statistics at the peer level. The `clear rip statistics peer address` command can be used to clear the RIP statistics for a peer. Alternatively, you can use the `show rip statistics peer all` and `clear rip statistics peer all` command to display and clear RIP statistics for all peers.

**Related
Documentation**

- [Example: Configuring Point-to-Multipoint RIP Networks on page 86](#)

Example: Configuring Point-to-Multipoint RIP Networks

This example shows how to configure a point-to-multipoint RIP network.

- [Requirements on page 86](#)
- [Overview on page 86](#)
- [Configuration on page 87](#)
- [Verification on page 90](#)

Requirements

This example uses the following hardware and software components:

- M Series routers, MX Series routers, T Series routers, or SRX Series devices
- Junos OS Release 12.1 or later

Overview

In a RIP network, a device can have a single peer or multiple peers for an interface. However, the demand circuit feature implementation in a RIP network requires the use of a single RIP peer.

When you include the following statements, the demand circuit implementation can have multiple peers for a given RIP neighbor.

- Configuring the interface type to be a multipoint interface by using the `interface-type (Protocols RIP) p2mp` statement.
- Enabling dynamic peer discovery by using the `dynamic-peers` statement (SRX Series devices only).



NOTE: To configure the `dynamic-peers` statement, IPsec tunnels must be set up by configuring IPsec parameters. See *Configuring Security Associations for IPsec on an ES PIC* for more details.

- Configuring peers by using the `peer address` statement.

```
[edit]
protocols {
  rip {
    group red {
      neighbor fe-0/1/3 {
        interface-type (Protocols RIP) p2mp;
        peer address; (or use dynamic-peers;)
      }
    }
  }
}
```

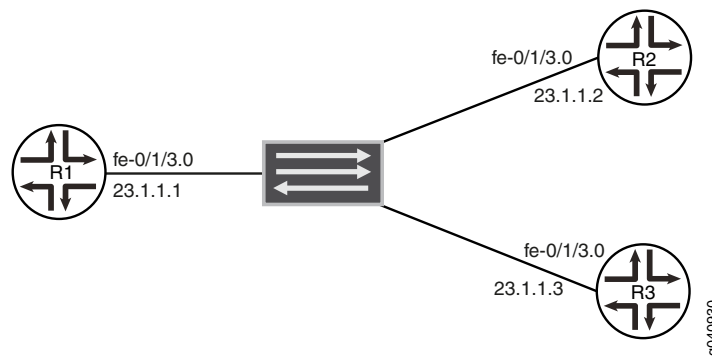
The `show rip statistics peer` command can be used to display the RIP statistics at the peer level.

Topology

In this example, Devices R1, R2, and R3 form a point-to-multipoint network. R1 is connected to R2 and to R3 as a point-to-multipoint connection through a switch that places all devices in the same broadcast domain. RIP demand circuits are configured on all three devices. The two peers to R1 are configured statically by using the `peer address` statement. The `dynamic-peers` statement is not used here.

Figure 14 on page 87 shows the topology used in this example.

Figure 14: Configuring a Point-to-Multipoint RIP Network



Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the `[edit]` hierarchy level.

Device R1

```
set interfaces fe-0/1/3 unit 0 family inet address 23.1.1/24
set policy-options policy-statement accept-rip-routes term from-direct from protocol direct
set policy-options policy-statement accept-rip-routes term from-direct then accept
set policy-options policy-statement accept-rip-routes term from-rip from protocol rip
set policy-options policy-statement accept-rip-routes term from-rip then accept
set protocols rip traceoptions file R1.log size 4m world-readable
```

```
set protocols rip traceoptions flag all detail
set protocols rip group red export accept-rip-routes
set protocols rip group red neighbor fe-0/1/3.0 interface-type p2mp
set protocols rip group red neighbor fe-0/1/3.0 peer 23.1.1.2
set protocols rip group red neighbor fe-0/1/3.0 peer 23.1.1.3
set protocols rip group red neighbor fe-0/1/3.0 demand-circuit
set protocols rip group red neighbor fe-0/1/3.0 max-retrans-time 10
```

Similarly, configure Devices R2 and R3, omitting the **peer address** configuration statement.

Configuring a Point-to-Multipoint RIP Network (with Demand Circuits)

Step-by-Step Procedure

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the point-to-multipoint feature across a RIP network:

1. Configure the device interface.

```
[edit interfaces fe-0/1/3 unit 0]
user@R1# set family inet address 23.1.1.1/24
```

2. Define a policy for exporting RIP routes from the routing table to the protocol for transmission through the network.

```
[edit policy-options policy-statement accept-rip-routes]
user@R1# set term from-direct from protocol direct
user@R1# set term from-direct then accept
user@R1# set term from-rip from protocol rip
user@R1# set term from-rip then accept
```

3. Configure RIP and a RIP group with the defined export policy and point-to-multipoint configuration statements.

```
[edit protocols rip]
user@R1# set traceoptions file R1.log size 4m world-readable
user@R1# set traceoptions flag all detail
user@R1# set group red export accept-rip-routes
user@R1# set group red neighbor fe-0/1/3.0 interface-type p2mp
user@R1# set group red neighbor fe-0/1/3.0 peer 23.1.1.2
user@R1# set group red neighbor fe-0/1/3.0 peer 23.1.1.3
user@R1# set group red neighbor fe-0/1/3.0 demand-circuit
user@R1# set group red neighbor fe-0/1/3.0 max-retrans-time 10
```

Similarly, configure Devices R2 and R3, omitting the **peer address** configuration statement.



NOTE: Configuring `max-retrans-time` is optional. In the absence of this configuration statement, the default retransmission time of 180 seconds is configured.

The configuration used in this example is for a RIP network with demand circuits. To configure RIP for networks without demand circuits, exclude the `demand-circuit` and `max-retrans-time` statements from the configuration and check the resulting output. For more information about configuring RIP demand circuits, see [“Example: Configuring RIP Demand Circuits” on page 55](#).

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show policy-options**, and **show protocols rip** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
[edit]
user@R1# show interfaces
fe-0/1/3 {
  unit 0 {
    family inet {
      address 23.1.1.1/24;
    }
  }
}

user@R1# show protocols rip
traceoptions {
  file R1.log size 4m world-readable;
  flag all detail;
}
group red {
  export accept-rip-routes;
  neighbor fe-0/1/3.0 {
    interface-type p2mp;
    peer 23.1.1.2;
    peer 23.1.1.3;
    demand-circuit;
    max-retrans-time 10;
  }
}

user@R1# show policy-options
policy-statement accept-rip-routes {
  term from-direct {
    from protocol direct;
    then accept;
  }
  term from-rip {
    from protocol rip;
  }
}
```

```
        then accept;  
    }  
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying the Point-to-Multipoint RIP Network

Purpose Verify that the RIP network is functional with the point-to-multipoint feature configured.

Action From operational mode, run the **show rip neighbor** command.

```
user@R1> show rip neighbor
```

Neighbor	Local State	Source Address	Destination Address	Send Mode	Receive Mode	In Met
fe-0/1/3.0(DC)	Up	23.1.1.1	23.1.1.2	unicast	unicast	1
fe-0/1/3.0(DC)	Up	23.1.1.1	23.1.1.3	unicast	unicast	1

From operational mode, run the **show rip statistics peer address** command.

```
user@R1> show rip statistics peer 23.1.1.2
```

RIPv2 info: port 520; holddown 120s.

rts learned	3	rts held down	0	rqsts dropped	0	resps dropped	0
-------------	---	---------------	---	---------------	---	---------------	---

fe-0/1/3.0 Peer-Ip 23.1.1.2: 2 routes learned; 3 routes advertised; timeout 180s; update interval 0s

Counter	Total	Last 5 min	Last minute
Updates Sent	0	0	0
Triggered Updates Sent	3	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	2	0	0
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0
none	3	0	0

```
user@R1> show rip statistics peer 23.1.1.3
```

RIPv2 info: port 520; holddown 120s.

rts learned	3	rts held down	0	rqsts dropped	0	resps dropped	0
-------------	---	---------------	---	---------------	---	---------------	---

fe-0/1/3.0 Peer-Ip 23.1.1.3: 2 routes learned; 3 routes advertised; timeout 180s; update interval 0s

Counter	Total	Last 5 min	Last minute
Updates Sent	0	0	0
Triggered Updates Sent	3	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	2	0	0
RIPv2 Bad Route Entries	0	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0

RIP Requests Ignored	0	0	0
none	3	0	0

Meaning The RIP network is up and running with the point-to-multipoint feature configured.

- Related Documentation**
- [demand-circuit on page 201](#)
 - [dynamic-peers on page 202](#)
 - [Example: Configuring RIP Demand Circuits on page 55](#)
 - [interface-type \(Protocols RIP\) on page 209](#)
 - [peer on page 215](#)

CHAPTER 9

Configuring RIP Import Policy

- [Understanding RIP Import Policy on page 93](#)
- [Example: Applying Policies to RIP Routes Imported from Neighbors on page 93](#)

Understanding RIP Import Policy

The default RIP import policy is to accept all received RIP routes that pass a sanity check. To filter routes being imported by the local routing device from its neighbors, include the **import** statement, and list the names of one or more policies to be evaluated. If you specify more than one policy, they are evaluated in order (first to last) and the first matching policy is applied to the route. If no match is found, the local routing device does not import any routes. Note that the functionality of applying policies to RIP routes imported from neighbors described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Release History Table

Release	Description
15.1X49	Note that the functionality of applying policies to RIP routes imported from neighbors described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Applying Policies to RIP Routes Imported from Neighbors on page 93](#)

Example: Applying Policies to RIP Routes Imported from Neighbors

This example shows how to configure an import policy in a RIP network.

- [Requirements on page 94](#)
- [Overview on page 94](#)
- [Configuration on page 94](#)
- [Verification on page 97](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

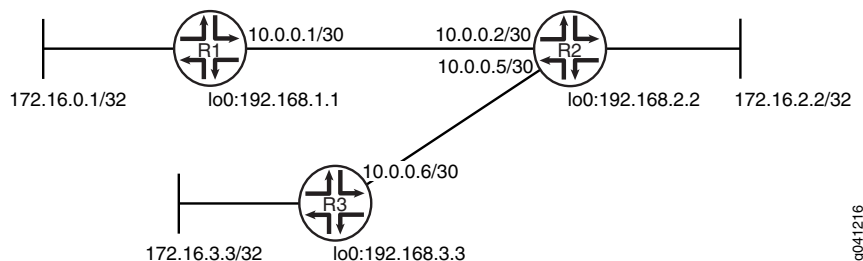
Overview

In this example, Device R1 has an import policy that accepts the 10/8 and 192.168/16 RIP routes and rejects all other RIP routes. This means that the 172.16/16 RIP routes are excluded from Device R1's routing table.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIP.

Figure 15 on page 94 shows the topology used in this example.

Figure 15: RIP Import Policy Network Topology



"CLI Quick Configuration" on page 94 shows the configuration for all of the devices in Figure 15 on page 94. The section "Step-by-Step Procedure" on page 95 describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

Device R1

```

set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip import rip-import
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
set policy-options policy-statement rip-import term 1 from protocol rip
set policy-options policy-statement rip-import term 1 from route-filter 10.0.0.0/8 orlonger
set policy-options policy-statement rip-import term 1 from route-filter 192.168.0.0/16
  orlonger

```

```
set policy-options policy-statement rip-import term 1 then accept
set policy-options policy-statement rip-import term 2 then reject
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIP import policy:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30
```

```
user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Create the RIP group and add the interface.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled.

You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

5. Configure the import policy.

```
[edit policy-options policy-statement rip-import]
user@R1# set term 1 from protocol rip
user@R1# set term 1 from route-filter 10.0.0.0/8 orlonger
user@R1# set term 1 from route-filter 192.168.0.0/16 orlonger
user@R1# set term 1 then accept
user@R1# set term 2 then reject
```

6. Apply the import policy.

```
[edit protocols rip]
user@R1# set import rip-import
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  import rip-import;
  group rip-group {
```

```

        export advertise-routes-through-rip;
        neighbor fe-1/2/0.1;
    }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
    term 1 {
        from protocol [ direct rip ];
        then accept;
    }
}
policy-statement rip-import {
    term 1 {
        from {
            protocol rip;
            route-filter 10.0.0.0/8 orlonger;
            route-filter 192.168.0.0/16 orlonger;
        }
        then accept;
    }
    term 2 {
        then reject;
    }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Looking at the Routes That Device R2 Is Advertising to Device R1 on page 97](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 98](#)
- [Checking the Routing Table on page 98](#)
- [Testing the Import Policy on page 99](#)

Looking at the Routes That Device R2 Is Advertising to Device R1

Purpose Verify that Device R2 is sending the expected routes.

Action From operational mode, enter the **show route advertising-protocol rip 10.0.0.2** command.

```

user@R2> show route advertising-protocol rip 10.0.0.2

inet.0: 11 destinations, 11 routes (11 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.4/30          *[Direct/0] 2d 01:17:44
                    >   via fe-1/2/0.5
172.16.2.2/32       *[Direct/0] 2d 04:09:52
                    >   via lo0.2
172.16.3.3/32       *[RIP/100] 23:40:02, metric 2, tag 0
                    > to 10.0.0.6 via fe-1/2/0.5

```

```
192.168.2.2/32    *[Direct/0] 2d 04:09:52
                  >    via lo0.2
192.168.3.3/32    *[RIP/100] 23:40:02, metric 2, tag 0
                  > to 10.0.0.6 via fe-1/2/0.5
```

Meaning Device R2 is sending 172.16/16 routes to Device R1.

Looking at the Routes That Device R1 Is Receiving from Device R2

Purpose Verify that Device R1 is receiving the expected routes.

Action From operational mode, enter the **show route receive-protocol rip** command.

```
user@R1> show route receive-protocol rip 10.0.0.2
inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.4/30        *[RIP/100] 01:06:03, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.2.2/32     *[RIP/100] 01:06:03, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.3.3/32     *[RIP/100] 01:06:03, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
```

Meaning The output shows that the 172.16/16 routes are excluded.

Checking the Routing Table

Purpose Verify that the routing table is populated with the expected routes.

Action From operational mode, enter the **show route protocol rip** command.

```
user@R1> show route protocol rip

inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.4/30        *[RIP/100] 00:54:34, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.2.2/32     *[RIP/100] 00:54:34, metric 2, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
192.168.3.3/32     *[RIP/100] 00:54:34, metric 3, tag 0
                  > to 10.0.0.2 via fe-1/2/0.1
224.0.0.9/32       *[RIP/100] 00:49:00, metric 1
                  MultiRecv
```

Meaning The output shows that the routes have been learned from Device R2 and Device R3.

If you delete or deactivate the import policy, the routing table contains the 172.16/16 routes.

Testing the Import Policy

Purpose By using the **test policy** command, monitor the number of rejected prefixes.

Action From operational mode, enter the **test policy rip-import 172.16/16** command.

```
user@R1> test policy rip-import 172.16/16  
Policy rip-import: 0 prefix accepted, 1 prefix rejected
```

Meaning The output shows that the policy rejected one prefix.

CHAPTER 10

Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets

- [Understanding the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101](#)
- [Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101](#)
- [Verifying the Exchange of RIP Messages on page 105](#)

Understanding the Sending and Receiving of RIPv1 and RIPv2 Packets

RIP version 1 (RIPv1) and RIP version 2 (RIPv2) can run simultaneously. This might make sense when you are migrating a RIPv1 network to a RIPv2 network. This also allows interoperability with a device that supports RIPv1 but not RIPv2.

By default, when RIP is enabled on an interface, Junos OS receives both RIPv1 and RIPv2 packets and sends only RIPv2 packets. You can configure this behavior by including the [send](#) and [receive](#) statements in the RIP configuration. Note that the functionality of configuring the sending and receiving of RIPv1 and RIPv2 packets described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Release History Table

Release	Description
15.149	Note that the functionality of configuring the sending and receiving of RIPv1 and RIPv2 packets described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101](#)

Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets

This example shows how to configure whether the RIP update messages conform to RIP version 1 (RIPv1) only, to RIP version 2 (RIPv2) only, or to both versions. You can also disable the sending or receiving of update messages.

- [Requirements on page 102](#)
- [Overview on page 102](#)

- [Configuration on page 102](#)
- [Verification on page 104](#)

Requirements

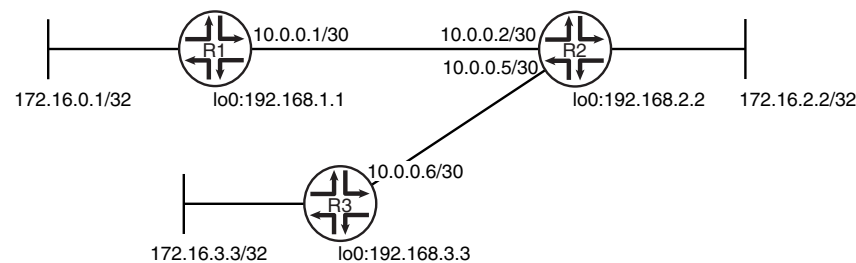
No special configuration beyond device initialization is required before configuring this example.

Overview

By default, when RIP is enabled on an interface, Junos OS receives both RIPv1 and RIPv2 packets and sends only RIPv2 packets.

[Figure 16 on page 102](#) shows the topology used in this example.

Figure 16: Sending and Receiving RIPv1 and RIPv2 Packets Network Topology



In this example, Device R1 is configured to receive only RIPv2 packets.

[“CLI Quick Configuration” on page 102](#) shows the configuration for all of the devices in [Figure 16 on page 102](#). The section [“Step-by-Step Procedure” on page 103](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1 receive version-2
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
```

```

set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIP packet versions that can be received:

1. Configure the network interfaces.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30

user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32

```

2. Create the RIP groups and add the interfaces.

To configure RIP in Junos OS, you must configure one or more groups that contain the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

For the interface that is facing Device R2, the **receive version-2** setting causes this interface to accept only RIPv2 packets.

```

[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1 receive version-2

```

3. Create the routing policy to advertise both direct and RIP-learned routes.

```

[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept

```

4. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1 {
      receive version-2;
    }
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying That the Receive Mode Is Set to RIPv2 Only

Purpose Make sure that the interfacing Device R2 is configured to receive only RIPv2 packets, instead of both RIPv1 and RIPv2 packets.

Action From operational mode, enter the **show rip neighbor** command.

```
user@R1> show rip neighbor
```

Neighbor	Local State	Source Address	Destination Address	Send Mode	Receive Mode	In Met
fe-1/2/0.1	Up	10.0.0.1	224.0.0.9	mcast	v2 only	1

Meaning In the output, the **Receive Mode** field displays **v2 only**. The default **Receive Mode** is **both**.

Verifying the Exchange of RIP Messages

Purpose Verify that RIP messages are being sent and received on all RIP-enabled interfaces.

Action From the CLI, enter the **show rip statistics** command.

Sample Output

```
user@host> show rip statistics
RIPv2 info: port 520; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              10              0              0              0

t1-0/0/2.0: 0 routes learned; 13 routes advertised; timeout 120s; update interval
45s
Counter                Total    Last 5 min  Last minute
-----
Updates Sent            2855         11          2
Triggered Updates Sent    5          0          0
Responses Sent           0          0          0
Bad Messages             0          0          0
RIPv1 Updates Received    0          0          0
RIPv1 Bad Route Entries    0          0          0
RIPv1 Updates Ignored     0          0          0
RIPv2 Updates Received    41         0          0
RIPv2 Bad Route Entries    0          0          0
RIPv2 Updates Ignored     0          0          0
Authentication Failures    0          0          0
RIP Requests Received     0          0          0
RIP Requests Ignored      0          0          0

ge-0/0/1.0: 10 routes learned; 3 routes advertised; timeout 180s; update interval
30s
Counter                Total    Last 5 min  Last minute
-----
Updates Sent            2855         11          2
Triggered Updates Sent    3          0          0
```

Responses Sent	0	0	0
Bad Messages	1	0	0
RIPv1 Updates Received	0	0	0
RIPv1 Bad Route Entries	0	0	0
RIPv1 Updates Ignored	0	0	0
RIPv2 Updates Received	2864	11	2
RIPv2 Bad Route Entries	14	0	0
RIPv2 Updates Ignored	0	0	0
Authentication Failures	0	0	0
RIP Requests Received	0	0	0
RIP Requests Ignored	0	0	0

Meaning The output shows the number of RIP routes learned. It also shows the number of RIP updates sent and received on the RIP-enabled interfaces. Verify the following information:

- The number of RIP routes learned matches the number of expected routes learned. Subnets learned by direct connectivity through an outgoing interface are not listed as RIP routes.
- RIP updates are being sent on each RIP-enabled interface. If no updates are being sent, the routing policy might not be configured to export routes.
- RIP updates are being received on each RIP-enabled interface. If no updates are being received, the routing policy might not be configured to export routes on the host connected to that subnet. The lack of updates might also indicate an authentication error.

Related Documentation

- [Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101](#)

Redistributing Routes Between Two RIP Instances

- [Understanding Route Redistribution Among RIP Instances on page 107](#)
- [Example: Redistributing Routes Between Two RIP Instances on page 108](#)

Understanding Route Redistribution Among RIP Instances

You can redistribute routes among RIP processes. Another way to say this is to export RIP routes from one RIP instance to other RIP instances.

In Junos OS, route redistribution among routing instances is accomplished by using routing table groups, also called RIB groups. Routing table groups allow you to import and export routes from a protocol within one routing table into another routing table. Note that the functionality of redistributing routes among RIP instances described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.



NOTE: In contrast, the policy-based import and export functions allow you import and export routes between different protocols within the same routing table.

Consider the following partial example:

```
protocols {
  rip {
    rib-group inet-to-voice;
  }
}
routing-instances {
  voice {
    protocols {
      rip {
        rib-group voice-to-inet;
      }
    }
  }
}
routing-options {
  rib-groups {
```

```

inet-to-voice {
    import-rib [ inet.0 voice.inet.0 ];
}
voice-to-inet {
    import-rib [ voice.inet.0 inet.0 ];
}
}

```

The way to read the **import-rib** statement is as follows. Take the routes from the protocol (RIP, in this case), and import them into the primary (or local) routing table and also into any other routing tables listed after this. The primary routing table is the routing table where the routing table group is being used. That would be either **inet.0** if used in the main routing instance or **voice.inet.0** if used within the routing instance. In the **inet-to-voice** routing table group, **inet.0** is listed first because this routing table group is used in the main routing instance. In the **voice-to-inet** routing table group, **voice.inet.0** is listed first because this routing table group is used in the voice routing instance.

Release History Table

Release	Description
15.1X49	Note that the functionality of redistributing routes among RIP instances described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Redistributing Routes Between Two RIP Instances on page 108](#)

Example: Redistributing Routes Between Two RIP Instances

This example shows how to configure a RIP routing instance and control the redistribution of RIP routes between the routing instance and the master instance.

- [Requirements on page 108](#)
- [Overview on page 108](#)
- [Configuration on page 109](#)
- [Verification on page 112](#)

Requirements

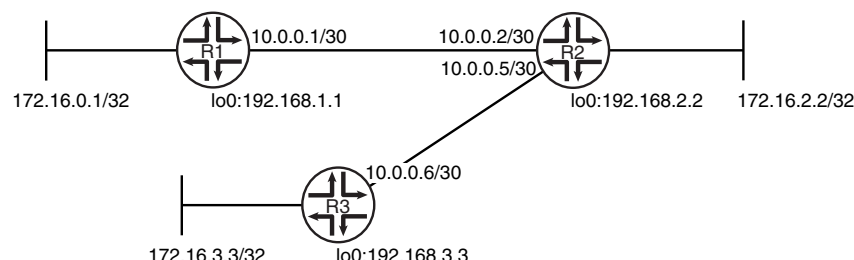
No special configuration beyond device initialization is required before configuring this example.

Overview

When you create a routing instance called **voice**, Junos OS creates a routing table called **voice.inet.0**. The example shows how to install routes learned through the master RIP instance into the **voice.inet.0** routing table. The example also shows how to install routes learned through the voice routing instance into **inet.0**. This is done by configuring routing table groups. RIP routes are installed into each routing table that belongs to a routing table group.

Figure 17 on page 109 shows the topology used in this example.

Figure 17: Redistributing Routes Between RIP Instances Network Topology



“CLI Quick Configuration” on page 109 shows the configuration for all of the devices in Figure 17 on page 109. The section “Step-by-Step Procedure” on page 110 describes the steps on Device R2.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

Device R1

```

set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip group to-R2 export advertise-routes-through-rip
set protocols rip group to-R2 neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip rib-group inet-to-voice
set protocols rip group to-R3 export advertise-routes-through-rip
set protocols rip group to-R3 neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
set routing-instances voice protocols rip group to-R1 export advertise-routes-through-rip
set routing-instances voice interface fe-1/2/0.2
set routing-instances voice protocols rip rib-group voice-to-inet
set routing-instances voice protocols rip group to-R1 neighbor fe-1/2/0.2
set routing-options rib-groups inet-to-voice import-rib inet.0
set routing-options rib-groups inet-to-voice import-rib voice.inet.0
set routing-options rib-groups voice-to-inet import-rib voice.inet.0

```

```
set routing-options rib-groups voice-to-inet import-rib inet.0
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group to-R2 export advertise-routes-through-rip
set protocols rip group to-R2 neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

**Step-by-Step
Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To redistribute RIP routes between routing instances:

1. Configure the network interfaces.

```
[edit interfaces]
user@R2# set fe-1/2/0 unit 2 family inet address 10.0.0.2/30
```

```
user@R2# set fe-1/2/1 unit 5 family inet address 10.0.0.5/30
```

```
user@R2# set lo0 unit 2 family inet address 192.168.2.2/32
user@R2# set lo0 unit 2 family inet address 172.16.2.2/32
```

2. Create the routing instance, and add one or more interfaces to the routing instance.

```
[edit routing-instances voice]
user@R2# set interface fe-1/2/0.2
```

3. Create the RIP groups and add the interfaces.

```
[edit protocols rip group to-R3]
user@R2# set neighbor fe-1/2/1.5
```

```
[edit routing-instances voice protocols rip group to-R1]
user@R2# set neighbor fe-1/2/0.2
```

4. Create the routing table groups.

```
[edit routing-options rib-groups]
user@R2# set inet-to-voice import-rib inet.0
user@R2# set inet-to-voice import-rib voice.inet.0
```

```
user@R2# set voice-to-inet import-rib voice.inet.0
user@R2# set voice-to-inet import-rib inet.0
```

5. Apply the routing table groups.

```
[edit protocols rip]
user@R2# set rib-group inet-to-voice
```

```
[edit routing-instances voice protocols rip]
user@R2# set rib-group voice-to-inet
```

6. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R2# set from protocol direct
user@R2# set from protocol rip
user@R2# set then accept
```

7. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group to-R3]
user@R2# set export advertise-routes-through-rip
```

```
[edit routing-instances voice protocols rip group to-R1]
user@R2# set export advertise-routes-through-rip
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, **show policy-options**, **show routing-instances**, and **show routing-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R2# show interfaces
fe-1/2/0 {
  unit 2 {
    family inet {
      address 10.0.0.2/30;
    }
  }
}
fe-1/2/1 {
  unit 5 {
    family inet {
      address 10.0.0.5/30;
    }
  }
}
lo0 {
  unit 2 {
    family inet {
      address 192.168.2.2/32;
      address 172.16.2.2/32;
    }
  }
}
user@R2# show protocols
```

```
rip {
  rib-group inet-to-voice;
  group to-R3 {
    export advertise-routes-through-rip;
    neighbor fe-1/2/1.5;
  }
}

user@R2# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}

user@R2# show routing-instances
voice {
  interface fe-1/2/0.2;
  protocols {
    rip {
      rib-group voice-to-inet;
      group to-R1 {
        export advertise-routes-through-rip;
        neighbor fe-1/2/0.2;
      }
    }
  }
}

user@R2# show routing-options
rib-groups {
  inet-to-voice {
    import-rib [ inet.0 voice.inet.0 ];
  }
  voice-to-inet {
    import-rib [ voice.inet.0 inet.0 ];
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Checking the Routing Tables

Purpose Make sure that the routing tables contain the expected routes.

Action From operational mode, enter the **show route protocol rip** command.

```
user@R2> show route protocol rip
inet.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
```

```

172.16.0.1/32      *[RIP/100] 01:58:14, metric 2, tag 0
                  > to 10.0.0.1 via fe-1/2/0.2
172.16.3.3/32     *[RIP/100] 02:06:03, metric 2, tag 0
                  > to 10.0.0.6 via fe-1/2/0.5
192.168.1.1/32    *[RIP/100] 01:58:14, metric 2, tag 0
                  > to 10.0.0.1 via fe-1/2/0.2
192.168.3.3/32    *[RIP/100] 02:06:03, metric 2, tag 0
                  > to 10.0.0.6 via fe-1/2/0.5
224.0.0.9/32     *[RIP/100] 01:44:13, metric 1
                  MultiRecv

voice.inet.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.0.1/32     *[RIP/100] 02:06:03, metric 2, tag 0
                  > to 10.0.0.1 via fe-1/2/0.2
172.16.3.3/32     *[RIP/100] 01:58:14, metric 2, tag 0
                  > to 10.0.0.6 via fe-1/2/0.5
192.168.1.1/32    *[RIP/100] 02:06:03, metric 2, tag 0
                  > to 10.0.0.1 via fe-1/2/0.2
192.168.3.3/32    *[RIP/100] 01:58:14, metric 2, tag 0
                  > to 10.0.0.6 via fe-1/2/0.5
224.0.0.9/32     *[RIP/100] 01:44:13, metric 1
                  MultiRecv

```

Meaning The output shows that both routing tables contain all of the RIP routes.

CHAPTER 12

Tracing RIP Protocol Traffic

- [Understanding RIP Trace Operations on page 115](#)
- [Example: Tracing RIP Protocol Traffic on page 116](#)

Understanding RIP Trace Operations

You can trace various types of RIP protocol traffic to help debug RIP protocol issues. Note that the functionality of tracing RIP protocol traffic described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

To trace RIP protocol traffic, include the **traceoptions** statement at the **[edit protocols rip]** hierarchy level:

```
traceoptions {  
    file filename <files number> <size size> <world-readable | no-world-readable>;  
    flag flag <flag-modifier> <disable>;  
}
```

You can specify the following RIP protocol-specific trace options using the **flag** statement:

- **auth**—RIP authentication
- **error**—RIP error packets
- **expiration**—RIP route expiration processing
- **holddown**—RIP hold-down processing
- **nsr-synchronization**—Nonstop active routing synchronization events
- **packets**—All RIP packets
- **request**—RIP information packets
- **trigger**—RIP triggered updates
- **update**—RIP update packets

You can optionally specify one or more of the following flag modifiers:

- **detail**—Detailed trace information
- **receive**—Packets being received
- **send**—Packets being transmitted



NOTE: Use the **detail** flag modifier with caution as this may cause the CPU to become very busy.

Global tracing options are inherited from the configuration set by the **traceoptions** statement at the **[edit routing-options]** hierarchy level. You can override the following global trace options for the RIP protocol using the **traceoptions flag** statement included at the **[edit protocols rip]** hierarchy level:

- **all**—All tracing operations
- **general**—All normal operations and routing table changes (a combination of the normal and route trace operations)
- **normal**—Normal events
- **policy**—Policy processing
- **route**—Routing information
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing



NOTE: Use the trace flag **all** with caution because this may cause the CPU to become very busy.

Release History Table

Release	Description
15.1X49	Note that the functionality of tracing RIP protocol traffic described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Tracing RIP Protocol Traffic on page 116](#)

Example: Tracing RIP Protocol Traffic

This example shows how to trace RIP protocol operations.

- [Requirements on page 117](#)
- [Overview on page 117](#)
- [Configuration on page 117](#)
- [Verification on page 120](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

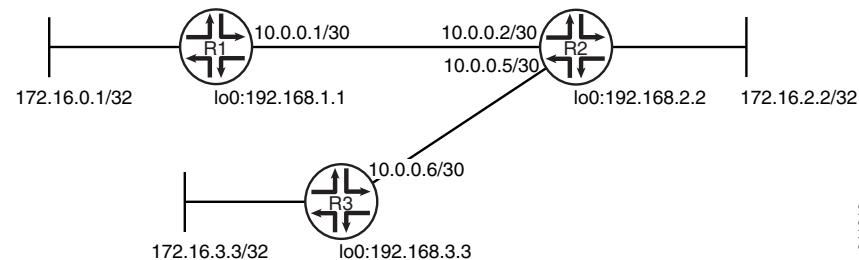
Overview

In this example, Device R1 is set to trace routing information updates.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIP.

Figure 18 on page 117 shows the topology used in this example.

Figure 18: RIP Trace Operations Network Topology



“CLI Quick Configuration” on page 117 shows the configuration for all of the devices in Figure 18 on page 117. The section “Step-by-Step Procedure” on page 118 describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```

set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip traceoptions file rip-trace-file
set protocols rip traceoptions flag route
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32

```

```
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the RIP update interval:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30
```

```
user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Configure the RIP group, and add the interface to the group.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Configure RIP tracing operations.

```
[edit protocols rip traceoptions]
user@R1# set file rip-trace-file
user@R1# set flag route
```

4. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
```

```

user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept

```

5. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```

[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip

```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```

user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
      address 172.16.0.1/32;
      address 192.168.1.1/32;
    }
  }
}

user@R1# show protocols
rip {
  traceoptions {
    file rip-trace-file;
    flag route;
  }
  group rip-group {
    export advertise-routes-through-rip;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
  term 1 {
    from protocol [ direct rip ];
    then accept;
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Checking the Log File

Purpose Make sure that the RIP route updates are logged in the configured log file.

Action 1. Deactivate the extra loopback interface address on Device R3.

```
[edit interfaces lo0 unit 3 family inet]
user@R3# deactivate address 172.16.3.3/32
user@R3# commit
```

2. From operational mode on Device R1, enter the **show log rip-trace-file** command with the **| match 172.16.3.3** option.

```
user@R1> show log rip-trace-file | match 172.16.3.3
Mar  1 11:39:53.975192 Setting RIPv2 rtbit on route 172.16.3.3/32, tsi =
0xbb69228
Mar  1 11:39:59.847118 172.16.3.3/32: metric-in: 16, change: 3 -> 16; # gw:
1, pkt_upd_src 10.0.0.2, inx: 0, rte_upd_src 10.0.0.2
Mar  1 11:39:59.847568 CHANGE 172.16.3.3/32      nhid 591 gw 10.0.0.2
      RIP      pref 100/0 metric 3/0 fe-1/2/0.1 <Delete Int>
Mar  1 11:39:59.847629 Best route to 172.16.3.3/32 got deleted. Doing route calculation
on the stored rte-info
```

Meaning The output shows that the route to 172.16.3.3/32 was deleted.

**Related
Documentation**

PART 3

Configuring RIPng

- [Configuring a Basic RIPng Network on page 123](#)
- [Applying Policies to RIPng Routes on page 131](#)
- [Configuring Traffic Control with Metrics in a RIPng Network on page 145](#)
- [Configuring RIPng Timers on page 153](#)
- [Tracing RIPng Protocol Traffic on page 161](#)

Configuring a Basic RIPng Network

- [Understanding Basic RIPng Routing on page 123](#)
- [Example: Configuring a Basic RIPng Network on page 123](#)

Understanding Basic RIPng Routing

By default, RIP next generation (RIPng) routes are not redistributed. You must configure export policy to redistribute RIPng routes.

To have a router exchange routes with other routers, you must configure RIPng groups and neighbors. RIPng routes received from routers not configured as RIPng neighbors are ignored. Likewise, RIPng routes are advertised only to routers configured as RIPng neighbors.

Related Documentation

- [RIPng Overview on page 11](#)
- [Example: Configuring a Basic RIPng Network on page 123](#)

Example: Configuring a Basic RIPng Network

This example shows how to configure a basic RIPng network.

- [Requirements on page 123](#)
- [Overview on page 123](#)
- [Configuration on page 124](#)
- [Verification on page 126](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

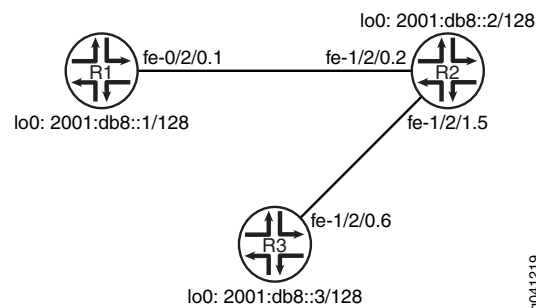
Overview

In this example, you configure a basic RIPng network, create a RIPng group called **ripng-group**, and add the directly connected interfaces to the RIPng group. Then you configure a routing policy to advertise direct routes using the policy statement **advertise-routes-through-ripng**.

By default, Junos OS does not advertise RIPng routes, not even routes that are learned through RIPng. To advertise RIPng routes, you must configure and apply an export routing policy that advertises RIPng-learned and direct routes.

To use RIPng on the device, you must configure RIPng on all of the RIPng interfaces within the network. [Figure 19 on page 124](#) shows the topology used in this example.

Figure 19: Sample RIPng Network Topology



[“CLI Quick Configuration” on page 124](#) shows the configuration for all of the devices in [Figure 19 on page 124](#). The section [“Step-by-Step Procedure” on page 125](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration	To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit] hierarchy level.
Device R1	<pre> set interfaces fe-1/2/0 unit 1 description to-R2 set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64 set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.1 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept </pre>
Device R2	<pre> set interfaces fe-1/2/0 unit 2 description to-R1 set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64 set interfaces fe-1/2/1 unit 5 description to-R3 set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64 set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.2 set protocols ripng group ripng-group neighbor fe-1/2/1.5 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng </pre>


```
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a basic RIPng network:

1. Configure the network interfaces.

Use the **eui-64** statement to automatically generate the host portion of the interface address and the link-local address.

For the loopback interface, you must assign a 128-bit address.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128
```

2. Create the RIPng group and add the interface.

To configure RIPng in Junos OS, you must configure a group that contains the interfaces on which RIPng is enabled. You do not need to enable RIPng on the loopback interface.

```
[edit protocols ripng group ripng-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Create the routing policy to advertise both direct and RIPng-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-ripng term 1]
user@R1# set from protocol direct
user@R1# set from protocol ripng
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIPng export policies at the group level.

```
[edit protocols ripng group ripng-group]
user@R1# set export advertise-routes-through-ripng
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

user@R1# show protocols
ripng {
  group ripng-group {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
policy-statement advertise-routes-through-ripng {
  term 1 {
    from protocol [ direct ripng ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking the Routing Table on page 127](#)
- [Checking the Interface Addresses on page 127](#)
- [Looking at the Routes That Device R1 Is Advertising to Device R2 on page 128](#)
- [Verifying the RIPng-Enabled Interfaces on page 128](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 128](#)
- [Verifying the Exchange of RIPng Messages on page 129](#)
- [Verifying Reachability of All Hosts in the RIPng Network on page 130](#)

Checking the Routing Table

Purpose Verify that the routing table is populated with the expected routes.

Action From operational mode, enter the **show route protocol ripng** command.

```
user@R1> show route protocol ripng
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 19:24:40, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:2::/64  *[RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:3::/64  *[RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:4::/64  *[RIPng/100] 3d 19:24:40, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
ff02::9/128       *[RIPng/100] 3d 19:24:47, metric 1
                  MultiRecv
```

Meaning The output shows that the routes have been learned from Device R2 and Device R3.

If you were to delete the **from protocol ripng** condition in the routing policy on Device R2, the remote routes from Device R3 would not be learned on Device R1.

Checking the Interface Addresses

Purpose Verify that the **eui-64** statement automatically generated the host portion of the interface address and the link-local address.

Action From operational mode, enter the **show interfaces terse** command.

```
user@R1> show interfaces terse
Interface           Admin Link Proto  Local                               Remote
fe-1/2/0
fe-1/2/0.1          up    up    inet6  2001:db8:0:1:2a0:a514:0:14c/64
                  fe80::2a0:a514:0:14c/64
lo0
lo0.1               up    up    inet6  2001:db8::1
                  fe80::2a0:a50f:fc56:14c
```

Meaning The output shows that the interface address on fe-1/2/0.1 includes both the network portion (2001:db8:0:1) and the host portion (2a0:a514:0:14c).

Also, link-local (fe80) addresses are assigned to interfaces fe-1/2/0.1 and lo0.1.

Looking at the Routes That Device R1 Is Advertising to Device R2

Purpose Verify that Device R1 is sending the expected routes.

Action From operational mode, enter the **show route advertising-protocol ripng** command, using Device R1's link-local address as the neighbor address.

```
user@R1> show route advertising-protocol ripng fe80::2a0:a514:0:14c
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::1/128    *[Direct/0] 3d 19:45:55
                  >    via lo0.1
2001:db8:0:1::/64  *[Direct/0] 3d 19:45:55
                  >    via fe-1/2/0.1
```

Meaning Device R1 is sending routes to its directly connected networks.

Verifying the RIPng-Enabled Interfaces

Purpose Verify that all RIPng-enabled Interfaces are available and active.

Action From operational mode, enter the **show ripng neighbor** command.

```
user@R1> show ripng neighbor
```

Neighbor	State	Source Address	Dest Address	Send	Recv	In Met
fe-1/2/0.1	Up	fe80::2a0:a514:0:14c	ff02::9	yes	yes	1

Meaning The output shows that the RIPng-enabled interface on Device R1 is operational.

The output also shows the link-local address that is assigned to Device R2's directly connected link-local interface.

In general for this command, the output shows a list of the RIPng neighbors that are configured on the device. Verify the following information:

- Each configured interface is present. Interfaces are listed in alphabetical order.
- Each configured interface is up. The state of the interface is listed in the **State** column. A state of **Up** indicates that the link is passing RIPng traffic. A state of **Dn** indicates that the link is not passing RIPng traffic. In a point-to-point link, this state generally means that either the end point is not configured for RIPng or the link is unavailable.

Looking at the Routes That Device R1 Is Receiving from Device R2

Purpose Verify that Device R1 is receiving the expected routes.

Action From operational mode, enter the **show route receive-protocol ripng** command, using Device R2's directly connected link-local interface address as the neighbor address.

```
user@R1> show route receive-protocol ripng fe80::2a0:a514:0:24c
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 19:58:06, metric 3, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:2::/64  *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:3::/64  *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:4::/64  *[RIPng/100] 3d 19:58:06, metric 3, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
```

Meaning Device R1 is receiving from Device R2 all of Device R2's directly connected networks. Device R1 is also receiving from Device R2 all of Device R3's directly connected networks, which Device R2 learned from Device R3 through RIPng.

Verifying the Exchange of RIPng Messages

Purpose Verify that RIPng messages are being sent and received on all RIPng-enabled interfaces.

Action From operational mode, enter the **show ripng statistics** command.

```
user@R1> show ripng statistics
RIPng info: port 521; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter              Total      Last 5 min  Last minute
-----
Updates Sent          11632          10           2
Triggered Updates Sent      0           0           0
Responses Sent         0           0           0
Bad Messages          0           0           0
Updates Received       11634          11           2
Bad Route Entries       0           0           0
Updates Ignored         0           0           0
RIPng Requests Received    1           0           0
RIPng Requests Ignored    0           0           0
```

Meaning The output shows the number of RIPng routes learned. It also shows the number of RIPng updates sent and received on the RIPng-enabled interfaces. Verify the following information:

- The number of RIPng routes learned matches the number of expected routes learned. Subnets learned by direct connectivity through an outgoing interface are not listed as RIPng routes.
- RIPng updates are being sent on each RIPng-enabled interface. If no updates are being sent, the routing policy might not be configured to export routes.
- RIPng updates are being received on each RIPng-enabled interface. If no updates are being received, the routing policy might not be configured to export routes on the host connected to that subnet. The lack of updates might also indicate an authentication error.

Verifying Reachability of All Hosts in the RIPng Network

Purpose By using the `traceroute` command on each loopback address in the network, verify that all hosts in the RIPng network are reachable from each Juniper Networks device.

Action From operational mode, enter the `traceroute` command.

```
user@R1> traceroute 2001:db8::3
traceroute6 to 2001:db8::3 (2001:db8::3) from 2001:db8:0:1:2a0:a514:0:14c, 64
hops max, 12 byte packets
 1 2001:db8:0:2:2a0:a514:0:24c (2001:db8:0:2:2a0:a514:0:24c) 8.881 ms 1.175
ms 1.101 ms
 2 2001:db8::3 (2001:db8::3) 1.544 ms 2.445 ms 2.043 ms
```

Meaning Each numbered row in the output indicates a routing hop in the path to the host. The three-time increments indicate the round-trip time (RTT) between the device and the hop for each traceroute packet.

To ensure that the RIPng network is healthy, verify the following information:

- The final hop in the list is the host you want to reach.
- The number of expected hops to the host matches the number of hops in the traceroute output. The appearance of more hops than expected in the output indicates that a network segment is probably unreachable. It might also indicate that the incoming or outgoing metric on one or more hosts has been set unexpectedly.

Related Documentation

- [Understanding Basic RIP Routing on page 18](#)
- [RIP Configuration Overview on page 17](#)

Applying Policies to RIPvng Routes

- [Understanding RIPvng Import Policies to Filter Routes on page 131](#)
- [Example: Applying Policies to RIPvng Routes Imported from Neighbors on page 131](#)
- [Example: Testing a Routing Policy with Complex Regular Expressions on page 137](#)

Understanding RIPvng Import Policies to Filter Routes

The default RIPvng import policy is to accept all received RIPvng routes that pass a validity check. To filter routes being imported by the local routing device from its neighbors, include the **import** statement and list the names of one or more policies to be evaluated. If you specify more than one policy, they are evaluated in order (first to last) and the first matching policy is applied to the route. If no match is found, the local routing device does not import any routes.

Related Documentation

- [Example: Applying Policies to RIPvng Routes Imported from Neighbors on page 131](#)

Example: Applying Policies to RIPvng Routes Imported from Neighbors

This example shows how to configure an import policy in a RIPvng network.

- [Requirements on page 131](#)
- [Overview on page 131](#)
- [Configuration on page 132](#)
- [Verification on page 135](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

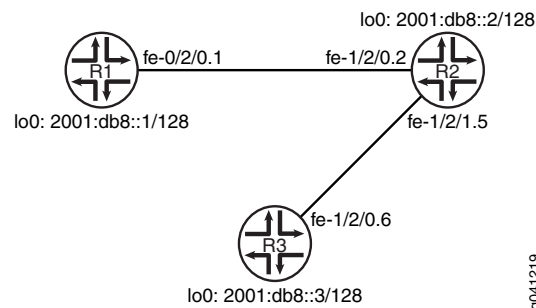
In this example, Device R2 has several extra loopback interface addresses configured to simulate additional networks.

Device R1 has an import policy that accepts the fe80::/64 and 2001:db8::/64 routes and rejects all other routes. This means that the extra networks advertised by Device R2 are not accepted into Device R1's routing table.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIPng.

[Figure 20 on page 132](#) shows the topology used in this example.

Figure 20: RIPng Import Policy Network Topology



"[CLI Quick Configuration](#)" on [page 132](#) shows the configuration for all of the devices in [Figure 20 on page 132](#). The section "[Step-by-Step Procedure](#)" on [page 133](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration	To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit] hierarchy level.
Device R1	<pre> set interfaces fe-1/2/0 unit 1 description to-R2 set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64 set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.1 import ripng-import set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept set policy-options policy-statement ripng-import term 1 from route-filter fe80::/64 orlonger set policy-options policy-statement ripng-import term 1 from route-filter 2001:db8::/64 orlonger set policy-options policy-statement ripng-import term 1 then accept set policy-options policy-statement ripng-import term 2 then reject </pre>
Device R2	<pre> set interfaces fe-1/2/0 unit 2 description to-R1 set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64 set interfaces fe-1/2/1 unit 5 description to-R3 set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64 </pre>


```

set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db8::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db9::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db7::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2
set protocols ripng group ripng-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIPng import policy:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128

```

2. Create the RIPng group and add the interface.

To configure RIPng in Junos OS, you must configure a group that contains the interfaces on which RIPng is enabled. You do not need to enable RIPng on the loopback interface.

```

[edit protocols ripng group ripng-group]
user@R1# set neighbor fe-1/2/0.1

```

3. Create the routing policy to advertise both direct and RIPng-learned routes.

```

[edit policy-options policy-statement advertise-routes-through-ripng term 1]
user@R1# set from protocol direct

```

```
user@R1# set from protocol ripng
user@R1# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIPng export policies at the group level.

```
[edit protocols ripng group ripng-group]
user@R1# set export advertise-routes-through-ripng
```

5. Configure the import policy.

```
[edit policy-options policy-statement ripng-import]
user@R1# set term 1 from route-filter fe80::/64 orlonger
user@R1# set term 1 from route-filter 2001:db8::/64 orlonger
user@R1# set term 1 then accept
user@R1# set term 2 then reject
```

6. Apply the import policy.

```
[edit protocols ripng group ripng-group]
user@R1# set neighbor fe-1/2/0.1 import ripng-import
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

user@R1# show protocols
ripng {
  group ripng-group {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.1 {
      import ripng-import;
    }
  }
}
```

```

    }
  }
  user@R1# show policy-options
  policy-statement advertise-routes-through-ripng {
    term 1 {
      from protocol [ direct ripng ];
      then accept;
    }
  }
  policy-statement ripng-import {
    term 1 {
      from {
        route-filter fe80::/64 orlonger;
        route-filter 2001:db8::/64 orlonger;
      }
      then accept;
    }
    term 2 {
      then reject;
    }
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Looking at the Neighbor Addresses for Device R2 on page 135](#)
- [Looking at the Routes That Device R2 Is Advertising to Device R1 on page 136](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 136](#)
- [Checking the Routing Table on page 136](#)

Looking at the Neighbor Addresses for Device R2

Purpose Determine the neighbor address that Device R2 is using for Device R1.

Action From operational mode, enter the **show ripng neighbor** command.

```
user@R2> show ripng neighbor fe-1/2/0.2
```

Neighbor	State	Source Address	Dest Address	Send	Recv	In Met
fe-1/2/0.2	Up	fe80::2a0:a514:0:24c	ff02::9	yes	yes	1

Meaning Device R2 is using the fe80::2a0:a514:0:24c address to send routes to Device R1.

Looking at the Routes That Device R2 Is Advertising to Device R1

Purpose Verify that Device R2 is sending the expected routes.

Action From operational mode, enter the **show route advertising-protocol ripng** command.

```
user@R2> show route advertising-protocol ripng fe80::2a0:a514:0:24c
inet6.0: 17 destinations, 18 routes (17 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[Direct/0] 3d 22:00:34
                  > via lo0.2
2001:db8::3/128    *[RIPng/100] 3d 21:47:00, metric 2, tag 0
                  > to fe80::2a0:a514:0:64c via fe-1/2/1.5
2001:db8:0:2::/64  *[Direct/0] 3d 22:00:34
                  > via fe-1/2/0.2
2001:db8:0:3::/64  *[Direct/0] 3d 22:00:34
                  > via fe-1/2/1.5
2001:db8:0:4::/64  *[RIPng/100] 3d 21:47:00, metric 2, tag 0
                  > to fe80::2a0:a514:0:64c via fe-1/2/1.5
2002:db7::2/128    *[Direct/0] 00:29:05
                  > via lo0.2
2002:db8::2/128    *[Direct/0] 00:31:49
                  > via lo0.2
2002:db9::2/128    *[Direct/0] 00:29:05
                  > via lo0.2
```

Meaning Device R2 is sending the extra loopback interface /128 routes to Device R1.

Looking at the Routes That Device R1 Is Receiving from Device R2

Purpose Verify that Device R1 is receiving the expected routes.

Action From operational mode, enter the **show route receive-protocol ripng** command.

```
user@R1> show route receive-protocol ripng fe80::2a0:a514:0:24c

inet6.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 21:55:49, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 21:55:46, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
```

Meaning The output shows that the extra loopback interface addresses are excluded.

Checking the Routing Table

Purpose Verify that the routing table is populated with the expected routes.

Action From operational mode, enter the **show route protocol ripng** command.

```
user@R1> show route protocol ripng
inet6.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 22:01:40, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 22:01:37, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
ff02::9/128       *[RIPng/100] 00:00:08, metric 1
                  MultiRecv
```

Meaning The output shows that the routes have been learned from Device R2 and Device R3.

If you delete or deactivate the import policy, the routing table contains the extra loopback interface routes.

Related Documentation

- [Understanding RIPng Import Policies to Filter Routes on page 131](#)

Example: Testing a Routing Policy with Complex Regular Expressions

This example shows how to test a routing policy using the **test policy** command to ensure that the policy produces the results that you expect before you apply it in a production environment. Regular expressions, especially complex ones, can be tricky to get right. This example shows how to use the **test policy** command to make sure that your regular expressions have the intended effect.

- [Requirements on page 137](#)
- [Overview on page 137](#)
- [Configuration on page 139](#)
- [Verification on page 143](#)

Requirements

No special configuration beyond device initialization is required before you configure this example.

Overview

This example shows two routing devices with an external BGP (EBGP) connection between them. Device R2 uses the BGP session to send customer routes to Device R1. These static routes have multiple community values attached.

```
user@R2> show route match-prefix 172.16.* detail

inet.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
172.16.1.0/24 (1 entry, 1 announced)
    *Static Preference: 5
    Next hop type: Reject
```

```
Address: 0x8fd0dc4
Next-hop reference count: 8
State: <Active Int Ext>
Local AS: 64511
Age: 21:32:13
Validation State: unverified
Task: RT
Announcement bits (1): 0-KRT
AS path: I
Communities: 64510:1 64510:10 64510:11 64510:100 64510:111
```

```
172.16.2.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Reject
    Address: 0x8fd0dc4
    Next-hop reference count: 8
    State: <Active Int Ext>
    Local AS: 64511
    Age: 21:32:13
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I
    Communities: 64510:2 64510:20 64510:22 64510:200 64510:222
```

```
172.16.3.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Reject
    Address: 0x8fd0dc4
    Next-hop reference count: 8
    State: <Active Int Ext>
    Local AS: 64511
    Age: 21:32:13
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I
    Communities: 64510:3 64510:30 64510:33 64510:300 64510:333
```

```
172.16.4.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Reject
    Address: 0x8fd0dc4
    Next-hop reference count: 8
    State: <Active Int Ext>
    Local AS: 64511
    Age: 21:32:13
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I
    Communities: 64510:4 64510:40 64510:44 64510:400 64510:444
```

To test a complex regular expression, Device R2 has a policy called **test-regex** that locates routes. The policy is configured like this:

```
policy-statement test-regex {
  term find-routes {
    from community complex-regex;
    then accept;
  }
}
```

```

}
term reject-the-rest {
  then reject;
}
}
community complex-regex members "^64510:[13].*$";

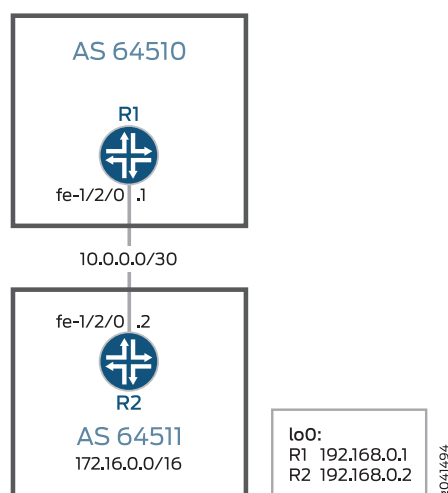
```

This regular expression matches community values beginning with either 1 or 3.

Topology

Figure 21 on page 139 shows the sample network.

Figure 21: Routing Policy Test for Complex Regular Expressions



“CLI Quick Configuration” on page 139 shows the configuration for all of the devices in Figure 21 on page 139.

The section “Step-by-Step Procedure” on page 140 describes the steps on Device R2.

Configuration

CLI Quick Configuration	To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit] hierarchy level.
Device R1	<pre> set interfaces fe-1/2/0 unit 0 family inet address 10.0.0.1/30 set interfaces lo0 unit 0 family inet address 192.168.0.1/32 set protocols bgp group ext type external set protocols bgp group ext peer-as 64511 set protocols bgp group ext neighbor 10.0.0.2 set routing-options router-id 192.168.0.1 set routing-options autonomous-system 64510 </pre>
Device R2	<pre> set interfaces fe-1/2/0 unit 0 family inet address 10.0.0.2/30 set interfaces lo0 unit 0 family inet address 192.168.0.2/32 set protocols bgp group ext type external </pre>

```

set protocols bgp group ext peer-as 64510
set protocols bgp group ext neighbor 10.0.0.1
set policy-options policy-statement send-static term 1 from protocol static
set policy-options policy-statement send-static term 1 then accept
set policy-options policy-statement send-static term 2 then reject
set policy-options policy-statement test-regex term find-routes from community
  complex-regex
set policy-options policy-statement test-regex term find-routes then accept
set policy-options policy-statement test-regex term reject-the-rest then reject
set policy-options community complex-regex members "~64510:[13].*$"
set routing-options static route 172.16.1.0/24 reject
set routing-options static route 172.16.1.0/24 community 64510:1
set routing-options static route 172.16.1.0/24 community 64510:10
set routing-options static route 172.16.1.0/24 community 64510:11
set routing-options static route 172.16.1.0/24 community 64510:100
set routing-options static route 172.16.1.0/24 community 64510:111
set routing-options static route 172.16.2.0/24 reject
set routing-options static route 172.16.2.0/24 community 64510:2
set routing-options static route 172.16.2.0/24 community 64510:20
set routing-options static route 172.16.2.0/24 community 64510:22
set routing-options static route 172.16.2.0/24 community 64510:200
set routing-options static route 172.16.2.0/24 community 64510:222
set routing-options static route 172.16.3.0/24 reject
set routing-options static route 172.16.3.0/24 community 64510:3
set routing-options static route 172.16.3.0/24 community 64510:30
set routing-options static route 172.16.3.0/24 community 64510:33
set routing-options static route 172.16.3.0/24 community 64510:300
set routing-options static route 172.16.3.0/24 community 64510:333
set routing-options static route 172.16.4.0/24 reject
set routing-options static route 172.16.4.0/24 community 64510:4
set routing-options static route 172.16.4.0/24 community 64510:40
set routing-options static route 172.16.4.0/24 community 64510:44
set routing-options static route 172.16.4.0/24 community 64510:400
set routing-options static route 172.16.4.0/24 community 64510:444
set routing-options router-id 192.168.0.2
set routing-options autonomous-system 64511

```

Step-by-Step Procedure

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure Device R2:

1. Configure the interfaces.

```
[edit interfaces]
```

```
user@R2# set fe-1/2/0 unit 0 family inet address 10.0.0.2/30
```

```
user@R2# set lo0 unit 0 family inet address 192.168.0.2/32
```

2. Configure BGP.

Apply the import policy to the BGP peering session with Device R2.

```
[edit protocols bgp group ext]
```



```

user@R2# set type external
user@R2# set peer-as 64510
user@R2# set neighbor 10.0.0.1

```

3. Configure the routing policy that sends static routes.

```

[edit policy-options policy-statement send-static]
user@R2# set term 1 from protocol static
user@R2# set term 1 then accept
user@R2# set term 2 then reject

```

4. Configure the routing policy that tests a regular expression.

```

[edit policy-options policy-statement test-regex]
user@R2# set term find-routes from community complex-regex
user@R2# set term find-routes then accept
user@R2# set term reject-the-rest then reject

```

```

[edit policy-options community]
user@R2# set complex-regex members "^64510:[13].*$"

```

5. Configure the static routes and attaches community values.

```

[edit routing-options static route 172.16.1.0/24]
user@R2# set reject
user@R2# set community [ 64510:1 64510:10 64510:11 64510:100 64510:111 ]

```

```

[edit routing-options static route 172.16.2.0/24]
user@R2# set reject
user@R2# set community [ 64510:2 64510:20 64510:22 64510:200 64510:222 ]

```

```

[edit routing-options static route 172.16.3.0/24]
user@R2# set reject
user@R2# set community [ 64510:3 64510:30 64510:33 64510:300 64510:333 ]

```

```

[edit routing-options static route 172.16.4.0/24]
user@R2# set reject
user@R2# set community [ 64510:4 64510:40 64510:44 64510:400 64510:444 ]

```

6. Configure the autonomous system (AS) number and the router ID.

This affects Device R2's routing table, and has no impact on Device R1 and Device R3.

```

[edit routing-options ]
user@R2# set router-id 192.168.0.2
user@R2# set autonomous-system 64511

```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, **show policy-options**, and **show routing-options** commands. If the output

does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R2# show interfaces
fe-1/2/0 {
  unit 0 {
    family inet {
      address 10.0.0.2/30;
    }
  }
}
lo0 {
  unit 0 {
    family inet {
      address 192.168.0.2/32;
    }
  }
}

user@R2# show protocols
bgp {
  group ext {
    type external;
    peer-as 64510;
    neighbor 10.0.0.1;
  }
}

user@R2# show policy-options
policy-statement send-static {
  term 1 {
    from protocol static;
    then accept;
  }
  term 2 {
    then reject;
  }
}
policy-statement test-regex {
  term find-routes {
    from community complex-regex;
    then accept;
  }
  term reject-the-rest {
    then reject;
  }
}
community complex-regex members "^64510:[13].*$";

user@R2# show routing-options
static {
  route 172.16.1.0/24 {
    reject;
    community [ 64510:1 64510:10 64510:11 64510:100 64510:111 ];
  }
  route 172.16.2.0/24 {
    reject;
  }
}
```

```

        community [ 64510:2 64510:20 64510:22 64510:200 64510:222 ];
    }
    route 172.16.3.0/24 {
        reject;
        community [ 64510:3 64510:30 64510:33 64510:300 64510:333 ];
    }
    route 172.16.4.0/24 {
        reject;
        community [ 64510:4 64510:40 64510:44 64510:400 64510:444 ];
    }
}
router-id 192.168.0.2;
autonomous-system 64511;

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Test to See Which Communities Match the Regular Expression

Purpose You can test the regular expression and its policy by using the **test policy policy-name** command.

Action 1. On Device R2, run the **test policy test-regex 0/0** command.

```
user@R2> test policy test-regex 0/0
```

```
inet.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
```

```
172.16.1.0/24      *[Static/5] 1d 00:32:50
                  Reject
172.16.3.0/24      *[Static/5] 1d 00:32:50
                  Reject
```

```
Policy test-regex: 2 prefix accepted, 5 prefix rejected
```

2. On Device R2, change the regular expression to match a community value containing any number of instances of the digit 2.

```
[edit policy-options community complex-regex]
user@R2# delete members "^64510:[13].*$"
user@R2# set members "^65020:2+$"
user@R2# commit
```

3. On Device R2, rerun the **test policy test-regex 0/0** command.

```
user@R2> test policy test-regex 0/0
```

```
inet.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
```

```
172.16.2.0/24      *[Static/5] 1d 00:31:36
```

Reject

Policy test-regex: 1 prefix accepted, 6 prefix rejected

Meaning The 172.16.1.0 /24 and 172.16.3.0/24 routes both have communities attached that match the ^64510:[13].*\$ expression. The 172.16.2.0/24 route has communities that match the ^65020:2+ expression.

Related Documentation

- *Understanding Routing Policy Tests*
- *Understanding How to Define BGP Communities and Extended Communities*
- *Understanding AS Path Regular Expressions for Use as Routing Policy Match Conditions*

Configuring Traffic Control with Metrics in a RIPng Network

- [Understanding RIPng Traffic Control with Metrics for Optimizing the Path Cost on page 145](#)
- [Example: Configuring the Metric Value Added to Imported RIPng Routes to Control the Route Selection Process on page 146](#)

Understanding RIPng Traffic Control with Metrics for Optimizing the Path Cost

To tune a RIPng network and to control traffic flowing through the network, you increase or decrease the cost of the paths through the network. RIPng provides two ways to modify the path cost: an incoming metric and an outgoing metric, which are each set to 1 by default. In other words, by default, the metric of routes that RIPng imports from a neighbor or exports to a neighbor is incremented by 1. These routes include those learned from RIPng as well as those learned from other protocols. The metrics are attributes that specify the cost of any route advertised through a host. By increasing or decreasing the metrics—and thus the cost—of links throughout the network, you can control packet transmission across the network.

The incoming metric modifies the cost of an individual segment when a route across the segment is imported into the routing table. For example, if you set the incoming metric on the segment to **3**, the individual segment cost along the link is changed from 1 to **3**. The increased cost affects all route calculations through that link. Other routes that were previously excluded because of a high hop count might now be selected into the router's forwarding table.

The outgoing metric modifies the path cost for all the routes advertised out of a particular interface. Unlike the incoming metric, the outgoing metric modifies the routes that other routers are learning and thereby controls the way they send traffic.

If an exported route was learned from a member of the same RIPng group, the metric associated with that route is the normal RIPng metric. For example, a RIPng route with a metric of 5 learned from a neighbor configured with an incoming metric of 2 is advertised with a combined metric of 7 when advertised to neighbors in the same group. However, if this route was learned from a RIPng neighbor in a different group or from a different protocol, the route is advertised with the metric value configured in the outgoing metric for that group.

You might want to increase the metric of routes to decrease the likelihood that a particular route is selected and installed in the routing table. This process is sometimes referred to as *route poisoning*. Some reasons that you might want to poison a route are that the route is relatively expensive to use, or it has relatively low bandwidth.

A route with a higher metric than another route becomes the active route only when the lower-metric route becomes unavailable. In this way, the higher-metric route serves as a backup path.

One way to increase the metric of imported routes is to configure an import policy. Another way is to include the **metric-in** statement in the RIPng neighbor configuration. One way to increase the metric of export routes is to configure an export policy. Another way is to include the **metric-out** statement in the RIPng neighbor configuration.

Related Documentation

- [Example: Configuring the Metric Value Added to Imported RIPng Routes to Control the Route Selection Process on page 146](#)

Example: Configuring the Metric Value Added to Imported RIPng Routes to Control the Route Selection Process

This example shows how to change the default metric to be added to incoming routes to control the route selection process.

- [Requirements on page 146](#)
- [Overview on page 146](#)
- [Configuration on page 147](#)
- [Verification on page 150](#)

Requirements

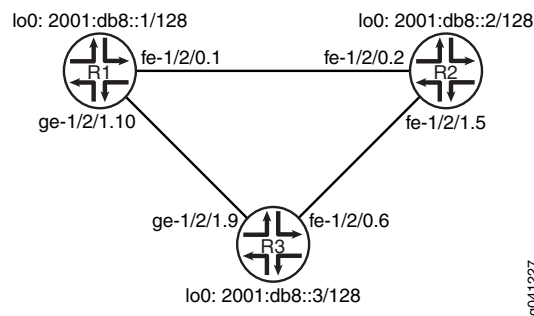
No special configuration beyond device initialization is required before configuring this example.

Overview

Normally, when multiple routes are available, RIPng selects the route with the lowest hop count. Changing the default metric enables you to control the route selection process such that a route with a higher hop count can be preferred over of a route with a lower hop count.

[Figure 22 on page 147](#) shows the topology used in this example.

Figure 22: RIPng Incoming Metrics Network Topology



Device R1 has two potential paths to reach 2001:db8::2/128. The default behavior is to send traffic out the 2001:db8:0:1::/64 interface facing Device R2. Suppose, though, that the path through Device R3 is less expensive to use or has higher bandwidth links. This example shows how to use the **metric-in** statement to ensure that Device R1 uses the path through Device R3 to reach 2001:db8::2/128. “[CLI Quick Configuration](#)” on page 147 shows the configuration for all of the devices in Figure 22 on page 147. The section “[Step-by-Step Procedure](#)” on page 148 describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```

set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64
set interfaces ge-1/2/1 unit 10 description to-R3
set interfaces ge-1/2/1 unit 10 family inet6 address 2001:db8:0:5::/64 eui-64
set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128
set protocols ripng group primary export advertise-routes-through-ripng
set protocols ripng group primary neighbor ge-1/2/1.10
set protocols ripng group secondary export advertise-routes-through-ripng
set protocols ripng group secondary neighbor fe-1/2/0.1 metric-in 4
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2
set protocols ripng group ripng-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct

```

```

set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces ge-1/2/1 unit 9 description to-R1
set interfaces ge-1/2/1 unit 9 family inet address 10.0.0.9/30
set interfaces ge-1/2/1 unit 9 family inet6 address 2001:db8:0:6::/64 eui-64
set interfaces lo0 unit 3 family inet address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set protocols ripng group ripng-group neighbor ge-1/2/1.9
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a RIPng metrics:

1. Configure the network interfaces.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set ge-1/2/1 unit 10 description to-R3
user@R1# set ge-1/2/1 unit 10 family inet6 address 2001:db8:0:5::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128

```

2. Create the RIPng groups and add the interfaces.

To configure RIPng in Junos OS, you must configure one or more groups that contain the interfaces on which RIPng is enabled. You do not need to enable RIPng on the loopback interface.

For the interface that is facing Device R2, the **metric-in 4** setting causes this route to be less likely to be chosen as the active route.

```

[edit protocols ripng]
user@R1# set group primary neighbor ge-1/2/1.10
user@R1# set group secondary neighbor fe-1/2/0.1 metric-in 4

```

3. Create the routing policy to advertise both direct and RIPng-learned routes.

```

[edit policy-options policy-statement advertise-routes-through-ripng term 1]
user@R1# set from protocol direct
user@R1# set from protocol ripng
user@R1# set then accept

```


4. Apply the routing policy.

In Junos OS, you can only apply RIPng export policies at the group level.

```
[edit protocols ripng]
user@R1# set group primary export advertise-routes-through-ripng
user@R1# set group secondary export advertise-routes-through-ripng
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
ge-1/2/1 {
  unit 10 {
    description to-R3;
    family inet6 {
      address 2001:db8:0:5::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

user@R1# show protocols
ripng {
  group primary {
    export advertise-routes-through-ripng;
    neighbor ge-1/2/0.10;
  }
  group secondary {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.1 {
      metric-in 4;
    }
  }
}
```

```
user@R1# show policy-options
policy-statement advertise-routes-through-ripng {
  term 1 {
    from protocol [ direct ripng ];
    then accept;
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Verifying That the Expected Route Is Active on page 150](#)
- [Removing the metric-in Statement on page 150](#)

Verifying That the Expected Route Is Active

Purpose	Make sure that Device R1 uses the path through Device R3 to reach 2001:db8:0:2:2a0:a514:0:24c/128.
Action	From operational mode, enter the show route 2001:db8:0:2:2a0:a514:0:24c command. user@R1> show route 2001:db8:0:2:2a0:a514:0:24c inet6.0: 16 destinations, 17 routes (16 active, 0 holddown, 0 hidden) + = Active Route, - = Last Active, * = Both 2001:db8:0:2::/64 * [RIPng/100] 01:54:35, metric 3, tag 0 > to fe80::2a0:a514:0:94c via ge-1/2/1.10
Meaning	The to fe80::2a0:a514:0:94c via ge-1/2/1.10 output shows that Device R1 uses the path through Device R3 to reach 2001:db8:0:2:2a0:a514:0:24c/128. The metric for this route is 3.

Removing the metric-in Statement

Purpose	Delete or deactivate the metric-in statement to see what happens to the 2001:db8:0:2:2a0:a514:0:24c/128 route.
Action	<ol style="list-style-type: none">1. From configuration mode, deactivate the metric-in statement. [edit protocols ripng group secondary neighbor fe-1/2/0.1] user@R1# deactivate metric-in user@R1# commit2. From operational mode, enter the show route 2001:db8:0:2:2a0:a514:0:24c command. user@R1> show route 2001:db8:0:2:2a0:a514:0:24c inet6.0: 16 destinations, 17 routes (16 active, 0 holddown, 0 hidden) + = Active Route, - = Last Active, * = Both

```
2001:db8:0:2::/64 *[RIPng/100] 00:00:02, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
```

Meaning The **to fe80::2a0:a514:0:24c via fe-1/2/0.1** output shows that Device R1 uses the path through Device R2 to reach 2001:db8:0:2:a0:a514:0:24c/128. The metric for this route is 2.

Related Documentation

- [Understanding RIPng Traffic Control with Metrics for Optimizing the Path Cost on page 145](#)

Configuring RIPng Timers

- [Understanding RIP Timers on page 153](#)
- [Example: Configuring RIPng Update Interval on page 154](#)

Understanding RIP Timers

RIP uses several timers to regulate its operation.

The update interval is the interval at which routes that are learned by RIP are advertised to neighbors. This timer controls the interval between routing updates. The update interval is set to 30 seconds, by default, with a small random amount of time added when the timer is reset. This added time prevents congestion that can occur if all routing devices update their neighbors simultaneously.

To configure the update time interval, include the **update-interval** statement:

```
update-interval seconds;
```

seconds can be a value from 10 through 60.

You can set a route timeout interval. If a route is not refreshed after being installed in the routing table by the specified time interval, the route is marked as invalid and is removed from the routing table after the hold-down period expires.

To configure the route timeout for RIP, include the **route-timeout** statement:

```
route-timeout seconds;
```

seconds can be a value from 30 through 360. The default value is 180 seconds.

RIP routes expire when either a route timeout limit is met or a route metric reaches infinity, and the route is no longer valid. However, the expired route is retained in the routing table for a specified period so that neighbors can be notified that the route has been dropped. This time period is set by configuring the hold-down timer. Upon expiration of the hold-down timer, the route is removed from the routing table.

To configure the hold-down timer for RIP, include the **holddown** statement:

```
holddown seconds;
```

seconds can be a value from 10 through 180. The default value is 120 seconds.



NOTE: In Junos OS Release 11.1 and later, a retransmission timer is available for RIP demand circuits.

Generally, we recommend against changing the RIP timers, unless the effects of a change are well understood. The route timeout should be at least three times the update interval. Normally, the default values are best left in effect for standard operations.

Release History Table

Release	Description
11.1	In Junos OS Release 11.1 and later, a retransmission timer is available for RIP demand circuits.

Related Documentation

- [Example: Configuring RIP Timers on page 46](#)
- [Example: Configuring RIP Demand Circuits](#)

Example: Configuring RIPng Update Interval

This example shows how to configure the RIPng update interval and how to monitor the impact of the change.

- [Requirements on page 154](#)
- [Overview on page 154](#)
- [Configuration on page 155](#)
- [Verification on page 158](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

Overview

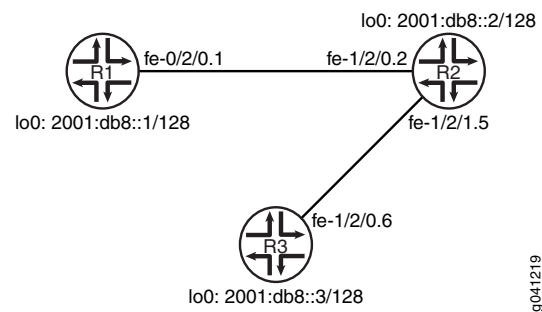
In this example, Device R2 has an update interval of 60 seconds for its neighbor Device R1, and an update interval of 10 seconds for its neighbor Device R3.

This example is not necessarily practical, but it is shown for demonstration purposes. Generally, we recommend against changing the RIPng timers, unless the effects of a change are well understood. Normally, the default values are best left in effect for standard operations.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIPng.

[Figure 23 on page 155](#) shows the topology used in this example.

Figure 23: RIPng Timers Network Topology



“CLI Quick Configuration” on page 155 shows the configuration for all of the devices in Figure 23 on page 155. The section “Step-by-Step Procedure” on page 156 describes the steps on Device R2.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```

set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64
set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R2

```

set interfaces fe-1/2/0 unit 2 description to-R1
set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2 update-interval 60
set protocols ripng group ripng-group neighbor fe-1/2/1.5 update-interval 10
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng

```

```
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the RIPng update interval:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R2# set fe-1/2/0 unit 2 description to-R1
user@R2# set fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64

user@R2# set fe-1/2/1 unit 5 description to-R3
user@R2# set fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64

user@R2# set lo0 unit 2 family inet6 address 2001:db8::2/128
```

2. Configure different update intervals for the two RIPng neighbors.

To configure RIPng in Junos OS, you must configure a group that contains the interfaces on which RIPng is enabled. You do not need to enable RIPng on the loopback interface.

```
[edit protocols ripng group ripng-group]
user@R2# set neighbor fe-1/2/0.2 update-interval 60
user@R2# set neighbor fe-1/2/1.5 update-interval 10
```

3. Create the routing policy to advertise both direct and RIPng-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-ripng term 1]
user@R2# set from protocol direct
user@R2# set from protocol ripng
user@R2# set then accept
```

4. Apply the routing policy.

In Junos OS, you can only apply RIPng export policies at the group level.

```
[edit protocols ripng group ripng-group]
user@R2# set export advertise-routes-through-ripng
```


Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```

user@R2# show interfaces
fe-1/2/0 {
  unit 2 {
    description to-R1;
    family inet6 {
      address 2001:db8:0:2::/64 {
        eui-64;
      }
    }
  }
}
fe-1/2/1 {
  unit 5 {
    description to-R3;
    family inet6 {
      address 2001:db8:0:3::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 2 {
    family inet6 {
      address 2001:db8::2/128;
    }
  }
}

user@R2# show protocols
ripng {
  group ripng-group {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.2 {
      update-interval 60;
    }
    neighbor fe-1/2/1.5 {
      update-interval 10;
    }
  }
}

user@R2# show policy-options
policy-statement advertise-routes-through-ripng {
  term 1 {
    from protocol [ direct ripng ];
    then accept;
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- [Checking the RIPng Updates Sent by Device R2 on page 158](#)
- [Checking the RIPng Updates Received by Device R2 on page 159](#)
- [Checking the RIPng Updates Received by Device R3 on page 159](#)

Checking the RIPng Updates Sent by Device R2

Purpose Make sure that the RIPng update packets are sent at the expected interval.

Action From operational mode, enter the **show ripng statistics** command.

```
user@R2> show ripng statistics
```

```
RIPng info: port 521; holddown 120s.
```

```
    rts learned   rts held down   rqsts dropped   resps dropped
          4             0             0             0
```

```
fe-1/2/0.2: 2 routes learned; 5 routes advertised; timeout 180s; update interval
60s
```

Counter	Total	Last 5 min	Last minute
Updates Sent	1	1	1
Triggered Updates Sent	0	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
Updates Received	1	0	0
Bad Route Entries	0	0	0
Updates Ignored	0	0	0
RIPng Requests Received	0	0	0
RIPng Requests Ignored	0	0	0

```
fe-1/2/1.5: 2 routes learned; 5 routes advertised; timeout 180s; update interval
10s
```

Counter	Total	Last 5 min	Last minute
Updates Sent	6	2	2
Triggered Updates Sent	0	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
Updates Received	2	0	0
Bad Route Entries	0	0	0
Updates Ignored	0	0	0
RIPng Requests Received	0	0	0
RIPng Requests Ignored	0	0	0

Meaning The **update interval** field shows that the interval is 60 seconds for its neighbor Device R1 and 10 seconds for its neighbor Device R3. The **Updates Sent** field shows that Device R2 is sending updates to Device R1 at roughly 1/6 of the rate that it is sending updates to Device R3.

Checking the RIPng Updates Received by Device R2

Purpose Make sure that the RIPng update packets are sent at the expected interval.

Action From operational mode, enter the **show ripng statistics** command.

```
user@R1> show ripng statistics
RIPng info: port 521; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              8              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter              Total    Last 5 min  Last minute
-----
Updates Sent          6          5          2
Triggered Updates Sent 0          0          0
Responses Sent        0          0          0
Bad Messages          0          0          0
Updates Received      3          3          1
Bad Route Entries     0          0          0
Updates Ignored       0          0          0
RIPng Requests Received 0          0          0
RIPng Requests Ignored 0          0          0
```

Meaning The **Updates Received** field shows the number of updates received from Device R2.

Checking the RIPng Updates Received by Device R3

Purpose Make sure that the RIPng update packets are sent at the expected interval.

Action From operational mode, enter the **show ripng statistics** command.

```
user@R3> show ripng statistics
RIPng info: port 521; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.6: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter              Total    Last 5 min  Last minute
-----
Updates Sent          5          5          2
Triggered Updates Sent 0          0          0
Responses Sent        0          0          0
Bad Messages          0          0          0
Updates Received     16         15          6
Bad Route Entries     0          0          0
Updates Ignored       0          0          0
RIPng Requests Received 0          0          0
RIPng Requests Ignored 0          0          0
```

Meaning The **Updates Received** field shows the number of updates received from Device R2.

Related Documentation

- [Understanding RIP Timers on page 45](#)

Tracing RIPng Protocol Traffic

- [Understanding RIPng Protocol Traffic Trace Operations on page 161](#)
- [Example: Tracing Global Routing Protocol Operations on page 162](#)
- [Example: Tracing RIPng Protocol Traffic on page 166](#)

Understanding RIPng Protocol Traffic Trace Operations

You can trace various RIPng protocol traffic to help debug RIP protocol issues.

To trace RIP protocol traffic, include the **traceoptions** statement at the **[edit protocols ripng]** hierarchy level:

```
traceoptions {  
    file filename <files number> <size size> <world-readable | no-world-readable>;  
    flag flag <flag-modifier> <disable>;  
}
```

You can specify the following RIPng protocol-specific trace options using the **flag** statement:

- **error**—RIPng error packets
- **expiration**—RIPng route expiration processing
- **holddown**—RIPng hold-down processing
- **nsr-synchronization**—Nonstop routing synchronization events
- **packets**—All RIPng packets
- **request**—RIPng information packets
- **trigger**—RIPng triggered updates
- **update**—RIPng update packets

You can optionally specify one or more of the following flag modifiers:

- **detail**—Detailed trace information
- **receive**—Packets being received
- **send**—Packets being transmitted



NOTE: Use the **detail** flag modifier with caution as this might cause the CPU to become very busy.

Global tracing options are inherited from the configuration set by the **traceoptions** statement at the **[edit routing-options]** hierarchy level. You can override the following global trace options for the RIPng protocol using the **traceoptions flag** statement included at the **[edit protocols ripng]** hierarchy level:

- **all**—All tracing operations
- **general**—All normal operations and routing table changes (a combination of the normal and route trace operations)
- **normal**—Normal events
- **policy**—Policy processing
- **route**—Routing information
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing



NOTE: Use the trace flag **all** with caution as this might cause the CPU to become very busy.

**Related
Documentation**

- [Example: Tracing RIPng Protocol Traffic on page 166](#)
- [Example: Tracing Global Routing Protocol Operations on page 162.](#)

Example: Tracing Global Routing Protocol Operations

This example shows how to list and view files that are created when you enable global routing trace operations.

- [Requirements on page 162](#)
- [Overview on page 163](#)
- [Configuration on page 163](#)
- [Verification on page 166](#)

Requirements

You must have the **view** privilege.

Overview

To configure global routing protocol tracing, include the **traceoptions** statement at the **[edit routing-options]** hierarchy level:

```
traceoptions {
  file filename <files number> <size size> <world-readable | no-world-readable>;
  flag flag <disable>;
}
```

The flags in a **traceoptions flag** statement are identifiers. When you use the **set** command to configure a flag, any flags that might already be set are not modified. In the following example, setting the **timer** tracing flag has no effect on the already configured **task** flag. Use the **delete** command to delete a particular flag.

```
[edit routing-options traceoptions]
user@host# show
flag task;
user@host# set traceoptions flag timer
user@host# show
flag task;
flag timer;
user@host# delete traceoptions flag task
user@host# show
flag timer;
```

This example shows how to configure and view a trace file that tracks changes in the routing table. The steps can be adapted to apply to trace operations for any Junos OS hierarchy level that supports trace operations.



TIP: To view a list of hierarchy levels that support tracing operations, enter the **help apropos traceoptions** command in configuration mode.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set routing-options traceoptions file routing-table-changes
set routing-options traceoptions file size 10m
set routing-options traceoptions file files 10
set routing-options traceoptions flag route
set routing-options static route 1.1.1.2/32 next-hop 10.0.45.6
```

Configuring Trace Operations

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the trace operations:

1. Configure trace operations.

```
[edit routing-options traceoptions]
user@host# set file routing-table-changes
user@host# set file size 10m
user@host# set file files 10
user@host# set flag route
```

2. Configure a static route to cause a change in the routing table.

```
[edit routing-options static]
user@host# set route 1.1.1.2/32 next-hop 10.0.45.6
```

3. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Viewing the Trace File

Step-by-Step Procedure To view the trace file:

1. In operational mode, list the log files on the system.

```
user@host> file list /var/log
/var/log:
...
routing-table-changes
...
```

2. View the contents of the **routing-table-changes** file.

```
user@host> file show /var/log/routing-table-changes
Dec 15 11:09:29 trace_on: Tracing to "/var/log/routing-table-changes" started
Dec 15 11:09:29.496507
Dec 15 11:09:29.496507 Tracing flags enabled: route
Dec 15 11:09:29.496507
Dec 15 11:09:29.533203 inet_routerid_notify: Router ID: 192.168.4.1
Dec 15 11:09:29.533334 inet_routerid_notify: No Router ID assigned
Dec 15 11:09:29.533381 inet_routerid_notify: No Router ID assigned
Dec 15 11:09:29.533420 inet_routerid_notify: No Router ID assigned
Dec 15 11:09:29.534915 inet_routerid_notify: Router ID: 192.168.4.1
Dec 15 11:09:29.542934 inet_routerid_notify: No Router ID assigned
Dec 15 11:09:29.549253 inet_routerid_notify: No Router ID assigned
Dec 15 11:09:29.556878 inet_routerid_notify: No Router ID assigned
```



```
Dec 15 11:09:29.582990 rt_static_reinit: examined 3 static nexthops, 0
unreferenced
Dec 15 11:09:29.589920
Dec 15 11:09:29.589920 task_reconfigure reinitializing done
...
```

3. Filter the output of the log file.

```
user@host> file show /var/log/routing-table-changes | match 1.1.1.2
Dec 15 11:15:30.780314 ADD      1.1.1.2/32          nhid 0 gw 10.0.45.6
      Static   pref 5/0 metric at-0/2/0.0 <ctive Int Ext>
Dec 15 11:15:30.782276 KRT Request: send len 216 v104 seq 0 ADD route/user
af 2 table 0 infot 0 addr 1.1.1.2 nhop-type unicast nhindex 663
```

4. View the tracing operations in real time by running the **monitor start** command with an optional **match** condition.

```
user@host> monitor start routing-table-changes | match 1.1.1.2
Aug 10 19:21:40.773467 BGP RECV      0.0.0.0/0
Aug 10 19:21:40.773685 bgp_rcv_nlri: 0.0.0.0/0
Aug 10 19:21:40.773778 bgp_rcv_nlri: 0.0.0.0/0 belongs to meshgroup
Aug 10 19:21:40.773832 bgp_rcv_nlri: 0.0.0.0/0 qualified bnp->ribact 0x0
12afcb 0x0
```

5. Deactivate the static route.

```
user@host# deactivate routing-options static route 1.1.1.2/32
user@host# commit

*** routing-table-changes ***
Dec 15 11:42:59.355557 CHANGE  1.1.1.2/32          nhid 663 gw 10.0.45.6
      Static   pref 5/0 metric at-0/2/0.0 <Delete Int Ext>
Dec 15 11:42:59.426887 KRT Request: send len 216 v104 seq 0 DELETE route/user
af 2 table 0 infot 0 addr 1.1.1.2 nhop-type discard filtidx 0
Dec 15 11:42:59.427366 RELEASE 1.1.1.2/32          nhid 663 gw 10.0.45.6
      Static   pref 5/0 metric at-0/2/0.0 <Release Delete Int Ext>
```

6. Halt the **monitor** command by pressing Enter and typing **monitor stop**.

```
[Enter]
user@host> monitor stop
```

7. When you are finished troubleshooting, consider deactivating trace logging to avoid any unnecessary impact to system resources.

When configuration is deactivated, it appears in the configuration with the **inactive** tag.

```
[edit routing-options]
user@host# deactivate traceoptions
user@host# commit

[edit routing-options]
user@host# show

inactive: traceoptions {
  file routing-table-changes size 10m files 10;
  flag route;
```

```
}
static {
    inactive: route 1.1.1.2/32 next-hop 10.0.45.6;
}
```

8. To reactivate trace operations, use the **activate** configuration-mode statement.

```
[edit routing-options]
user@host# activate traceoptions
user@host# commit
```

Results

From configuration mode, confirm your configuration by entering the **show routing-options** command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show routing-options
traceoptions {
    file routing-table-changes size 10m files 10;
    flag route;
}
static {
    route 1.1.1.2/32 next-hop 10.0.45.6;
}
```

Verification

Confirm that the configuration is working properly.

Verifying That the Trace Log File Is Operating

Purpose Make sure that events are being written to the log file.

Action user@host> show log routing-table-changes
Dec 15 11:09:29 trace_on: Tracing to "/var/log/routing-table-changes" started

Related Documentation

- [Understanding Global Routing Protocol Tracing Operations](#)
- [CLI Explorer](#)

Example: Tracing RIPng Protocol Traffic

This example shows how to trace RIPng protocol operations.

- [Requirements on page 167](#)
- [Overview on page 167](#)

- [Configuration on page 167](#)
- [Verification on page 170](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

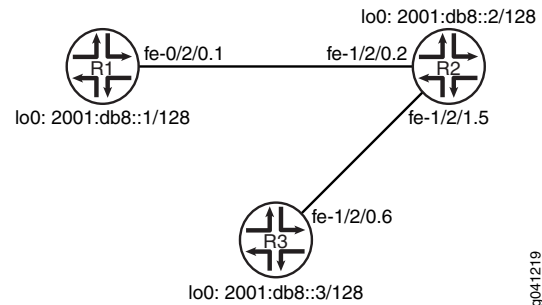
Overview

In this example, Device R1 is set to trace routing information updates.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIPng.

[Figure 24 on page 167](#) shows the topology used in this example.

Figure 24: RIPng Trace Operations Network Topology



[“CLI Quick Configuration” on page 167](#) shows the configuration for all of the devices in [Figure 24 on page 167](#). The section [“Step-by-Step Procedure” on page 168](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration	To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit] hierarchy level.
Device R1	<pre> set interfaces fe-1/2/0 unit 1 description to-R2 set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64 set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128 set protocols ripng traceoptions file ripng-trace-file set protocols ripng traceoptions flag route set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.1 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept </pre>

Device R2

```
set interfaces fe-1/2/0 unit 2 description to-R1
set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2
set protocols ripng group ripng-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the RIPng update interval:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128
```

2. Configure the RIPng group, and add the interface to the group.

To configure RIPng in Junos OS, you must configure a group that contains the interfaces on which RIPng is enabled. You do not need to enable RIPng on the loopback interface.

```
[edit protocols ripng group ripng-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Configure RIPng tracing operations.

```
[edit protocols ripng traceoptions]
```

```
user@R1# set file ripng-trace-file
user@R1# set flag route
```

4. Create the routing policy to advertise both direct and RIPng-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-ripng term 1]
user@R1# set from protocol direct
user@R1# set from protocol ripng
user@R1# set then accept
```

5. Apply the routing policy.

In Junos OS, you can only apply RIPng export policies at the group level.

```
[edit protocols ripng group ripng-group]
user@R1# set export advertise-routes-through-ripng
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

user@R1# show protocols
ripng {
  traceoptions {
    file ripng-trace-file;
    flag route;
  }
  group ripng-group {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.1;
  }
}

user@R1# show policy-options
```

```

policy-statement advertise-routes-through-ripng {
  term 1 {
    from protocol [ direct ripng ];
    then accept;
  }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Checking the Log File

Purpose Make sure that the RIPng route updates are logged in the configured log file.

- Action**
1. Deactivate the extra loopback interface address on Device R3.

```

[edit interfaces lo0 unit 3 family inet6]
user@R3# deactivate address 2001:db8::3/128
user@R3# commit

```
 2. From operational mode, enter the **show log ripng-trace-file** command with the **| match 2001:db8::3** option.

```

user@R1> show log ripng-trace-file | match 2001:db8::3

```

```

Mar  6 14:57:03.516867 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:57:32.786286 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:58:02.584669 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:58:30.213894 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:59:00.115110 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:59:05.826644 Setting RIPng rtbit on route 2001:db8::3/128, tsi =
0xbb69880
Mar  6 14:59:13.014652 2001:db8::3/128: metric-in: 16, change: 3 -> 16; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar  6 14:59:13.015132 CHANGE 2001:db8::3/128 nhid 566 gw
fe80::2a0:a514:0:24c RIPng pref 100/0 metric 3/0 fe-1/2/0.1 **Delete Int>
Mar  6 14:59:13.015197 Best route to 2001:db8::3/128 got deleted. Doing route
calculation on the stored rte-info

```

Meaning The output shows that the route to 2001:db8::3/128 was deleted.

Related Documentation

- [Understanding RIPng Protocol Traffic Trace Operations on page 161](#)

PART 4

Troubleshooting

- [Troubleshooting Network Issues on page 173](#)
- [Monitoring and Troubleshooting a RIP Network on page 181](#)

CHAPTER 18

Troubleshooting Network Issues

- [Working with Problems on Your Network on page 173](#)
- [Isolating a Broken Network Connection on page 174](#)
- [Identifying the Symptoms of a Broken Network Connection on page 175](#)
- [Isolating the Causes of a Network Problem on page 176](#)
- [Taking Appropriate Action for Resolving the Network Problem on page 177](#)
- [Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 178](#)

Working with Problems on Your Network

Problem **Description:** This checklist provides links to troubleshooting basics, an example network, and includes a summary of the commands you might use to diagnose problems with the router and network.

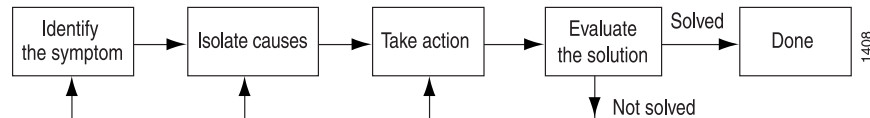
Table 10: Checklist for Working with Problems on Your Network

Tasks	Command or Action
"Isolating a Broken Network Connection" on page 174	
1. Identifying the Symptoms of a Broken Network Connection on page 175	<code>ping (ip-address hostname)</code> <code>show route (ip-address hostname)</code> <code>tracert (ip-address hostname)</code>
2. Isolating the Causes of a Network Problem on page 176	<code>show < configuration interfaces protocols route ></code>
3. Taking Appropriate Action for Resolving the Network Problem on page 177	<code>[edit]</code> <code>delete routing options static route destination-prefix</code> <code>commit and-quit</code> <code>show route destination-prefix</code>
4. Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 178	<code>show route (ip-address hostname)</code> <code>ping (ip-address hostname) count 3</code> <code>tracert (ip-address hostname)</code>

Isolating a Broken Network Connection

By applying the standard four-step process illustrated in [Figure 25 on page 174](#), you can isolate a failed node in the network. Note that the functionality described in this section is not supported in versions 15.1X49, 15.1X49-D30, or 15.1X49-D40.

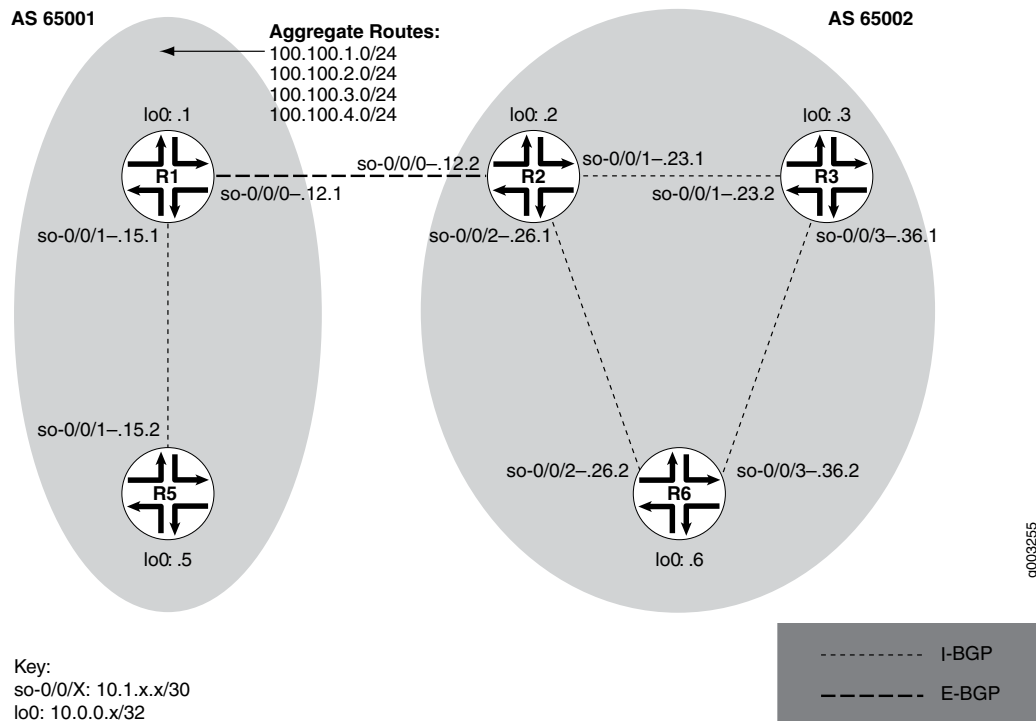
Figure 25: Process for Diagnosing Problems in Your Network



Before you embark on the four-step process, however, it is important that you are prepared for the inevitable problems that occur on all networks. While you might find a solution to a problem by simply trying a variety of actions, you can reach an appropriate solution more quickly if you are systematic in your approach to the maintenance and monitoring of your network. To prepare for problems on your network, understand how the network functions under normal conditions, have records of baseline network activity, and carefully observe the behavior of your network during a problem situation.

[Figure 26 on page 174](#) shows the network topology used in this topic to illustrate the process of diagnosing problems in a network.

Figure 26: Network with a Problem



The network in [Figure 26 on page 174](#) consists of two autonomous systems (ASs). AS 65001 includes two routers, and AS 65002 includes three routers. The border router (R1) in AS 65001 announces aggregated prefixes **100.100/24** to the AS 65002 network. The

problem in this network is that **R6** does not have access to **R5** because of a loop between **R2** and **R6**.

To isolate a failed connection in your network, follow the steps in these topics:

- [Identifying the Symptoms of a Broken Network Connection on page 175](#)
- [Isolating the Causes of a Network Problem on page 176](#)
- [Taking Appropriate Action for Resolving the Network Problem on page 177](#)
- [Taking Appropriate Action for Resolving the Network Problem on page 177](#)
- [Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 178](#)

Identifying the Symptoms of a Broken Network Connection

Problem **Description:** The symptoms of a problem in your network are usually quite obvious, such as the failure to reach a remote host.

Solution To identify the symptoms of a problem on your network, start at one end of your network and follow the routes to the other end, entering all or one of the following Junos OS command-line interfaces (CLI) operational mode commands:

```
user@host> ping (ip-address | host-name)
user@host> show route (ip-address | host-name)
user@host> traceroute (ip-address | host-name)
```

Sample Output

```
user@R6> ping 10.0.0.5
PING 10.0.0.5 (10.0.0.5): 56 data bytes
36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS Len ID Flg off TTL Pro cks Src Dst
 4 5 00 0054 e2db 0 0000 01 01 a8c6 10.1.26.2 10.0.0.5

36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS Len ID Flg off TTL Pro cks Src Dst
 4 5 00 0054 e2de 0 0000 01 01 a8c3 10.1.26.2 10.0.0.5

36 bytes from 10.1.26.1: Time to live exceeded
Vr HL TOS Len ID Flg off TTL Pro cks Src Dst
 4 5 00 0054 e2e2 0 0000 01 01 a8bf 10.1.26.2 10.0.0.5

^C
--- 10.0.0.5 ping statistics ---
3 packets transmitted, 0 packets received, 100% packet loss

user@R6> show route 10.0.0.5

inet.0: 20 destinations, 20 routes (20 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32          *[IS-IS/165] 00:02:39, metric 10
                    > to 10.1.26.1 via so-0/0/2.0

user@R6> traceroute 10.0.0.5
```

```

traceroute to 10.0.0.5 (10.0.0.5), 30 hops max, 40 byte packets
 1  10.1.26.1 (10.1.26.1)  0.649 ms  0.521 ms  0.490 ms
 2  10.1.26.2 (10.1.26.2)  0.521 ms  0.537 ms  0.507 ms
 3  10.1.26.1 (10.1.26.1)  0.523 ms  0.536 ms  0.514 ms
 4  10.1.26.2 (10.1.26.2)  0.528 ms  0.551 ms  0.523 ms
 5  10.1.26.1 (10.1.26.1)  0.531 ms  0.550 ms  0.524 ms

```

Meaning

The sample output shows an unsuccessful **ping** command in which the packets are being rejected because the time to live is exceeded. The output for the **show route** command shows the interface (10.1.26.1) that you can examine further for possible problems. The **traceroute** command shows the loop between 10.1.26.1 (R2) and 10.1.26.2 (R6), as indicated by the continuous repetition of the two interface addresses.

Isolating the Causes of a Network Problem

Problem **Description:** A particular symptom can be the result of one or more causes. Narrow down the focus of your search to find each individual cause of the unwanted behavior.

Solution To isolate the cause of a particular problem, enter one or all of the following Junos OS CLI operational mode command:

```
user@host> show < configuration | bgp | interfaces | isis | ospf | route >
```

Your particular problem may require the use of more than just the commands listed above. See the appropriate command reference for a more exhaustive list of commonly used operational mode commands.

Sample Output

```

user@R6> show interfaces terse
Interface           Admin Link Proto Local                               Remote
so-0/0/0            up   up   inet  10.1.56.2/30
so-0/0/0.0           up   up   inet  10.1.56.2/30
                    up   up   iso
so-0/0/2            up   up   inet  10.1.26.2/30
so-0/0/2.0          up   up   inet  10.1.26.2/30
                    up   up   iso
so-0/0/3            up   up   inet  10.1.36.2/30
so-0/0/3.0          up   up   inet  10.1.36.2/30
                    up   up   iso
[...Output truncated...]

```

The following sample output is from R2:

```

user@R2> show route 10.0.0.5

inet.0: 22 destinations, 25 routes (22 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32          * [Static/5] 00:16:21
                    > to 10.1.26.2 via so-0/0/2.0
                    [BGP/170] 3d 20:23:35, MED 5, localpref 100

```

```
AS path: 65001 I
> to 10.1.12.1 via so-0/0/0.0
```

Meaning

The sample output shows that all interfaces on **R6** are up. The output from **R2** shows that a static route [**Static/5**] configured on **R2** points to **R6** (**10.1.26.2**) and is the preferred route to **R5** because of its low preference value. However, the route is looping from **R2** to **R6**, as indicated by the missing reference to **R5** (**10.1.15.2**).

Taking Appropriate Action for Resolving the Network Problem

Problem **Description:** The appropriate action depends on the type of problem you have isolated. In this example, a static route configured on **R2** is deleted from the [**routing-options**] hierarchy level. Other appropriate actions might include the following:

Solution

- Check the local router's configuration and edit it if appropriate.
- Troubleshoot the intermediate router.
- Check the remote host configuration and edit it if appropriate.
- Troubleshoot routing protocols.
- Identify additional possible causes.

To resolve the problem in this example, enter the following Junos OS CLI commands:

```
[edit]
user@R2# delete routing-options static route destination-prefix
user@R2# commit and-quit
user@R2# show route destination-prefix
```

Sample Output

```
[edit]
user@R2# delete routing-options static route 10.0.0.5/32

[edit]
user@R2# commit and-quit
commit complete
Exiting configuration mode

user@R2> show route 10.0.0.5

inet.0: 22 destinations, 24 routes (22 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32          *[BGP/170] 3d 20:26:17, MED 5, localpref 100
                    AS path: 65001 I
                    > to 10.1.12.1 via so-0/0/0.0
```

Meaning

The sample output shows the static route deleted from the [routing-options] hierarchy and the new configuration committed. The output for the **show route** command now shows the BGP route as the preferred route, as indicated by the asterisk (*).

Evaluating the Solution to Check Whether the Network Problem Is Resolved

Problem **Description:** If the problem is solved, you are finished. If the problem remains or a new problem is identified, start the process over again.

You can address possible causes in any order. In relation to the network in “[Isolating a Broken Network Connection](#)” on page 174, we chose to work from the local router toward the remote router, but you might start at a different point, particularly if you have reason to believe that the problem is related to a known issue, such as a recent change in configuration.

Solution To evaluate the solution, enter the following Junos OS CLI commands:

```
user@host> show route (ip-address | host-name)
user@host> ping (ip-address | host-name)
user@host> traceroute (ip-address | host-name)
```

Sample Output

```
user@R6> show route 10.0.0.5

inet.0: 20 destinations, 20 routes (20 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32          *[BGP/170]  00:01:35, MED 5, localpref 100, from 10.0.0.2
                    AS path: 65001 I
                    > to 10.1.26.1 via so-0/0/2.0

user@R6> ping 10.0.0.5
PING 10.0.0.5 (10.0.0.5): 56 data bytes
64 bytes from 10.0.0.5: icmp_seq=0 ttl=253 time=0.866 ms
64 bytes from 10.0.0.5: icmp_seq=1 ttl=253 time=0.837 ms
64 bytes from 10.0.0.5: icmp_seq=2 ttl=253 time=0.796 ms
^C
--- 10.0.0.5 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.796/0.833/0.866/0.029 ms

user@R6> traceroute 10.0.0.5
traceroute to 10.0.0.5 (10.0.0.5), 30 hops max, 40 byte packets
 1  10.1.26.1 (10.1.26.1)  0.629 ms  0.538 ms  0.497 ms
 2  10.1.12.1 (10.1.12.1)  0.534 ms  0.538 ms  0.510 ms
 3  10.0.0.5 (10.0.0.5)   0.776 ms  0.705 ms  0.672 ms
```

Meaning

The sample output shows that there is now a connection between R6 and R5. The **show route** command shows that the BGP route to R5 is preferred, as indicated by the asterisk

(*). The **ping** command is successful and the **tracert** command shows that the path from **R6** to **R5** is through **R2 (10.1.26.1)**, and then through **R1 (10.1.12.1)**.

Monitoring and Troubleshooting a RIP Network

- [Monitoring RIP Routing Information on page 181](#)
- [Understanding RIP Trace Operations on page 182](#)
- [Example: Tracing RIP Protocol Traffic on page 184](#)
- [Verifying a RIP Configuration on page 188](#)

Monitoring RIP Routing Information

Purpose



NOTE: This topic applies only to the J-Web Application package.

Use the monitoring functionality to monitor RIP routing on routing devices.

Action

To view RIP routing information in the J-Web interface, select **Monitor > Routing > RIP Information**.

To view RIP routing information in the CLI, enter the following CLI commands:

- `show rip statistics`
- `show rip neighbor`

Meaning

[Table 11 on page 181](#) summarizes key output fields in the RIP routing display in the J-Web interface.

Table 11: Summary of Key RIP Routing Output Fields

Field	Values	Additional Information
RIP Statistics		
Protocol Name	The RIP protocol name.	
Port number	The port on which RIP is enabled.	

Table 11: Summary of Key RIP Routing Output Fields (*continued*)

Field	Values	Additional Information
Hold down time	The interval during which routes are neither advertised nor updated.	
Global routes learned	Number of RIP routes learned on the logical interface.	
Global routes held down	Number of RIP routes that are not advertised or updated during the hold-down interval.	
Global request dropped	Number of requests dropped.	
Global responses dropped	Number of responses dropped.	
RIP Neighbors		
Neighbor	Name of the RIP neighbor.	This value is the name of the interface on which RIP is enabled. Click the name to see the details for this neighbor.
State	State of the RIP connection: Up or Dn (Down).	
Source Address	Local source address.	This value is the configured address of the interface on which RIP is enabled.
Destination Address	Destination address.	This value is the configured address of the immediate RIP adjacency.
Send Mode	The mode of sending RIP messages.	
Receive Mode	The mode in which messages are received.	
In Metric	Value of the incoming metric configured for the RIP neighbor.	

Understanding RIP Trace Operations

You can trace various types of RIP protocol traffic to help debug RIP protocol issues. Note that the functionality of tracing RIP protocol traffic described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

To trace RIP protocol traffic, include the **traceoptions** statement at the **[edit protocols rip]** hierarchy level:

```
traceoptions {
  file filename <files number> <size size> <world-readable | no-world-readable>;
  flag flag <flag-modifier> <disable>;
}
```

You can specify the following RIP protocol-specific trace options using the **flag** statement:

- **auth**—RIP authentication
- **error**—RIP error packets
- **expiration**—RIP route expiration processing
- **holddown**—RIP hold-down processing
- **nsr-synchronization**—Nonstop active routing synchronization events
- **packets**—All RIP packets
- **request**—RIP information packets
- **trigger**—RIP triggered updates
- **update**—RIP update packets

You can optionally specify one or more of the following **flag** modifiers:

- **detail**—Detailed trace information
- **receive**—Packets being received
- **send**—Packets being transmitted



NOTE: Use the **detail** flag modifier with caution as this may cause the CPU to become very busy.

Global tracing options are inherited from the configuration set by the **traceoptions** statement at the **[edit routing-options]** hierarchy level. You can override the following global trace options for the RIP protocol using the **traceoptions flag** statement included at the **[edit protocols rip]** hierarchy level:

- **all**—All tracing operations
- **general**—All normal operations and routing table changes (a combination of the normal and route trace operations)
- **normal**—Normal events
- **policy**—Policy processing
- **route**—Routing information
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing



NOTE: Use the **trace** flag **all** with caution because this may cause the CPU to become very busy.

Release History Table

Release	Description
15.1X49	Note that the functionality of tracing RIP protocol traffic described in this topic is not supported in Junos OS Releases 15.1X49, 15.1X49-D30, or 15.1X49-D40.

Related Documentation

- [Example: Tracing RIP Protocol Traffic on page 116](#)

Example: Tracing RIP Protocol Traffic

This example shows how to trace RIP protocol operations.

- [Requirements on page 184](#)
- [Overview on page 184](#)
- [Configuration on page 185](#)
- [Verification on page 187](#)

Requirements

No special configuration beyond device initialization is required before configuring this example.

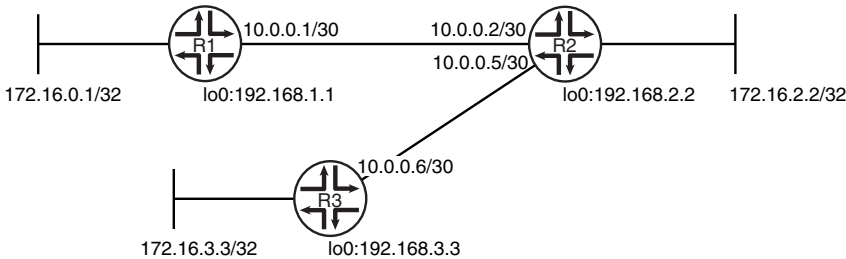
Overview

In this example, Device R1 is set to trace routing information updates.

An export policy is also shown because an export policy is required as part of the minimum configuration for RIP.

[Figure 18 on page 117](#) shows the topology used in this example.

Figure 27: RIP Trace Operations Network Topology



[“CLI Quick Configuration” on page 117](#) shows the configuration for all of the devices in [Figure 18 on page 117](#). The section [“Step-by-Step Procedure” on page 118](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

Device R1

```
set interfaces fe-1/2/0 unit 1 family inet address 10.0.0.1/30
set interfaces lo0 unit 1 family inet address 172.16.0.1/32
set interfaces lo0 unit 1 family inet address 192.168.1.1/32
set protocols rip traceoptions file rip-trace-file
set protocols rip traceoptions flag route
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R2

```
set interfaces fe-1/2/0 unit 2 family inet address 10.0.0.2/30
set interfaces fe-1/2/1 unit 5 family inet address 10.0.0.5/30
set interfaces lo0 unit 2 family inet address 192.168.2.2/32
set interfaces lo0 unit 2 family inet address 172.16.2.2/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.2
set protocols rip group rip-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 family inet address 10.0.0.6/30
set interfaces lo0 unit 3 family inet address 192.168.3.3/32
set interfaces lo0 unit 3 family inet address 172.16.3.3/32
set protocols rip group rip-group export advertise-routes-through-rip
set protocols rip group rip-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-rip term 1 from protocol
  rip
set policy-options policy-statement advertise-routes-through-rip term 1 then accept
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the RIP update interval:

1. Configure the network interfaces.

This example shows multiple loopback interface addresses to simulate attached networks.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 family inet address 10.0.0.1/30
```

```
user@R1# set lo0 unit 1 family inet address 172.16.0.1/32
user@R1# set lo0 unit 1 family inet address 192.168.1.1/32
```

2. Configure the RIP group, and add the interface to the group.

To configure RIP in Junos OS, you must configure a group that contains the interfaces on which RIP is enabled. You do not need to enable RIP on the loopback interface.

```
[edit protocols rip group rip-group]
user@R1# set neighbor fe-1/2/0.1
```

3. Configure RIP tracing operations.

```
[edit protocols rip traceoptions]
user@R1# set file rip-trace-file
user@R1# set flag route
```

4. Create the routing policy to advertise both direct and RIP-learned routes.

```
[edit policy-options policy-statement advertise-routes-through-rip term 1]
user@R1# set from protocol direct
user@R1# set from protocol rip
user@R1# set then accept
```

5. Apply the routing policy.

In Junos OS, you can only apply RIP export policies at the group level.

```
[edit protocols rip group rip-group]
user@R1# set export advertise-routes-through-rip
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show protocols**, and **show policy-options** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    family inet {
      address 10.0.0.1/30;
    }
  }
}
lo0 {
  unit 1 {
    family inet {
```

```

        address 172.16.0.1/32;
        address 192.168.1.1/32;
    }
}
}

user@R1# show protocols
rip {
    traceoptions {
        file rip-trace-file;
        flag route;
    }
    group rip-group {
        export advertise-routes-through-rip;
        neighbor fe-1/2/0.1;
    }
}

user@R1# show policy-options
policy-statement advertise-routes-through-rip {
    term 1 {
        from protocol [ direct rip ];
        then accept;
    }
}

```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Checking the Log File

Purpose Make sure that the RIP route updates are logged in the configured log file.

Action 1. Deactivate the extra loopback interface address on Device R3.

```

[edit interfaces lo0 unit 3 family inet]
user@R3# deactivate address 172.16.3.3/32
user@R3# commit

```

2. From operational mode on Device R1, enter the **show log rip-trace-file** command with the **| match 172.16.3.3** option.

```

user@R1> show log rip-trace-file | match 172.16.3.3
Mar  1 11:39:53.975192 Setting RIPv2 rtbit on route 172.16.3.3/32, tsi =
0xbb69228
Mar  1 11:39:59.847118 172.16.3.3/32: metric-in: 16, change: 3 -> 16; # gw:
1, pkt_upd_src 10.0.0.2, inx: 0, rte_upd_src 10.0.0.2
Mar  1 11:39:59.847568 CHANGE 172.16.3.3/32 nhid 591 gw 10.0.0.2
RIP pref 100/0 metric 3/0 fe-1/2/0.1 <Delete Int>
Mar  1 11:39:59.847629 Best route to 172.16.3.3/32 got deleted. Doing route calculation
on the stored rte-info

```

Meaning The output shows that the route to 172.16.3.3/32 was deleted.

**Related
Documentation**

Verifying a RIP Configuration

To verify a RIP configuration, perform the following tasks:

- [Verifying the RIP-Enabled Interfaces on page 188](#)
- [Verifying Reachability of All Hosts in the RIP Network on page 188](#)

Verifying the RIP-Enabled Interfaces

Purpose Verify that all the RIP-enabled interfaces are available and active.

Action From the CLI, enter the **show rip neighbor** command.

Sample Output

```
user@host> show rip neighbor
Source      Destination  Send  Receive  In
Neighbor    State  Address    Address    Mode    Mode    Met
-----
ge-0/0/0.0   Dn (null)    (null)
ge-0/0/1.0   Up 192.168.220.5  224.0.0.9  mcast  both    1
```

Meaning The output shows a list of the RIP neighbors that are configured on the device. Verify the following information:

- Each configured interface is present. Interfaces are listed in alphabetical order.
- Each configured interface is up. The state of the interface is listed in the **Destination State** column. A state of **Up** indicates that the link is passing RIP traffic. A state of **Dn** indicates that the link is not passing RIP traffic. In a point-to-point link, this state generally means that either the end point is not configured for RIP or the link is unavailable.

See Also • [Verifying a RIP Configuration on page 188](#)

Verifying Reachability of All Hosts in the RIP Network

Purpose By using the traceroute tool on each loopback address in the network, verify that all hosts in the RIP network are reachable from each Juniper Networks device.

Action For each device in the RIP network:

1. In the J-Web interface, select **Troubleshoot>Traceroute**.
2. In the Remote Host box, type the name of a host for which you want to verify reachability from the device.
3. Click **Start**. Output appears on a separate page.

Sample Output

```
1 172.17.40.254 (172.17.40.254) 0.362 ms 0.284 ms 0.251 ms
2 router-a-fxp0.eng1ab.mycompany.net (192.168.71.246) 0.251 ms 0.235 ms 0.200 ms
```

Meaning Each numbered row in the output indicates a routing hop in the path to the host. The three-time increments indicate the round-trip time (RTT) between the device and the hop for each traceroute packet.

To ensure that the RIP network is healthy, verify the following information:

- The final hop in the list is the host you want to reach.
- The number of expected hops to the host matches the number of hops in the traceroute output. The appearance of more hops than expected in the output indicates that a network segment is probably unreachable. It might also indicate that the incoming or outgoing metric on one or more hosts has been set unexpectedly.

See Also • [RIP Overview on page 3](#)

Related Documentation

- [RIP Configuration Overview on page 17](#)
- [show rip statistics on page 271](#) in the CLI Explorer
- [show rip neighbor on page 269](#) in the CLI Explorer
- [traceroute](#) in the CLI Explorer
- [RIP Overview on page 3](#)

PART 5

Configuration Statements and Operational Commands

- [RIP Configuration Statements on page 193](#)
- [RIPng Configuration Statements on page 229](#)
- [RIP Operational Commands on page 247](#)
- [RIPng Operational Commands on page 467](#)

CHAPTER 20

RIP Configuration Statements

- [any-sender](#) on page 194
- [authentication-key \(Protocols RIP\)](#) on page 195
- [authentication-type \(Protocols RIP\)](#) on page 196
- [bfd-liveness-detection \(Protocols RIP\)](#) on page 197
- [check-zero](#) on page 200
- [demand-circuit \(Protocols RIP\)](#) on page 201
- [dynamic-peers](#) on page 202
- [export](#) on page 203
- [graceful-restart \(Protocols RIP\)](#) on page 204
- [group \(Protocols RIP\)](#) on page 205
- [holddown \(Protocols RIP\)](#) on page 207
- [import \(Protocols RIP\)](#) on page 208
- [interface-type \(Protocols RIP\)](#) on page 209
- [max-retrans-time](#) on page 210
- [message-size](#) on page 211
- [metric-in \(Protocols RIP\)](#) on page 212
- [metric-out](#) on page 213
- [neighbor](#) on page 214
- [peer \(Protocols RIP\)](#) on page 215
- [preference \(Protocols RIP\)](#) on page 216
- [receive \(Protocols RIP\)](#) on page 217
- [rib-group \(Protocols RIP\)](#) on page 218
- [rip](#) on page 219
- [route-timeout \(Protocols RIP\)](#) on page 220
- [routing-instances \(Multiple Routing Entities\)](#) on page 221
- [send \(Protocols RIP\)](#) on page 223
- [traceoptions \(Protocols RIP\)](#) on page 224
- [update-interval \(Protocols RIP\)](#) on page 227

any-sender

Syntax	<code>any-sender;</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 8.0. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Disable strict sender address checks.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

authentication-key (Protocols RIP)

Syntax	<code>authentication-key password;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Require authentication for RIP route queries received on an interface.
Options	password —Authentication password. If the password does not match, the packet is rejected. The password can be from 1 through 16 contiguous characters long and can include any ASCII strings.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Route Authentication for RIP on page 30

authentication-type (Protocols RIP)

Syntax	<code>authentication-type type;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols rip],</p> <p>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Configure the type of authentication for RIP route queries received on an interface.
Default	If you do not include this statement and the authentication-key statement, RIP authentication is disabled.
Options	<p>type—Authentication type:</p> <ul style="list-style-type: none"> md5—Use the MD5 algorithm to create an encoded checksum of the packet. The encoded checksum is included in the transmitted packet. The receiving routing device uses the authentication key to verify the packet, discarding it if the digest does not match. This algorithm provides a more secure authentication scheme. none—Disable authentication. If none is configured, the configured authentication key is ignored. simple—Use a simple password. The password is included in the transmitted packet, which makes this method of authentication relatively insecure. The password can be from 1 through 16 contiguous letters or digits long.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Example: Configuring Route Authentication for RIP on page 30 authentication-key on page 195

bfd-liveness-detection (Protocols RIP)

Syntax	<pre> bfd-liveness-detection { authentication { algorithm <i>algorithm-name</i>; key-chain <i>key-chain-name</i>; loose-check; } detection-time { threshold <i>milliseconds</i>; } minimum-interval <i>milliseconds</i>; minimum-receive-interval <i>milliseconds</i>; multiplier <i>number</i>; no-adaptation; transmit-interval { minimum-interval <i>milliseconds</i>; threshold <i>milliseconds</i>; } version (1 automatic); }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols rip group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.0.</p> <p>Options detection-time threshold and transmit-interval threshold introduced in Junos OS Release 8.2.</p> <p>Support for logical systems introduced in Junos OS Release 8.3.</p> <p>Option no-adaptation introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Options authentication algorithm, authentication key-chain, and authentication loose-check introduced in Junos OS Release 9.6.</p> <p>Options authentication algorithm, authentication key-chain, and authentication loose-check introduced in Junos OS Release 9.6 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	<p>Configure bidirectional failure detection timers and authentication.</p> <p>The remaining statements are explained separately. See CLI Explorer.</p>
Options	<p>authentication algorithm <i>algorithm-name</i> —Configure the algorithm used to authenticate the specified BFD session: simple-password, keyed-md5, keyed-sha-1, meticulous-keyed-md5, or meticulous-keyed-sha-1.</p>

authentication key-chain *key-chain-name*—Associate a security key with the specified BFD session using the name of the security keychain. The name you specify must match one of the keychains configured in the **authentication-key-chains key-chain** statement at the **[edit security]** hierarchy level.

authentication loose-check—(Optional) Configure loose authentication checking on the BFD session. Use only for transitional periods when authentication is not configured at both ends of the BFD session.

detection-time threshold *milliseconds*—Configure a threshold for the adaptation of the BFD session detection time. When the detection time adapts to a value equal to or greater than the threshold, a single trap and a single system log message are sent.

minimum-interval *milliseconds*—Configure the minimum interval after which the local routing device transmits a hello packet and then expects to receive a reply from the neighbor with which it has established a BFD session. Optionally, instead of using this statement, you can specify the minimum transmit and receive intervals separately using the **transmit-interval minimum-interval** and **minimum-receive-interval** statements.

Range: 1 through 255,000 milliseconds

minimum-receive-interval *milliseconds*—Configure the minimum interval after which the local routing device expects to receive a reply from a neighbor with which it has established a BFD session. Optionally, instead of using this statement, you can configure the minimum receive interval using the **minimum-interval** statement.

Range: 1 through 255,000 milliseconds

multiplier *number*—Configure the number of hello packets not received by a neighbor that causes the originating interface to be declared down.

Range: 1 through 255

Default: 3

no-adaptation—Configure BFD sessions not to adapt to changing network conditions. We recommend that you not disable BFD adaptation unless it is preferable not to have BFD adaptation enabled in your network.

transmit-interval threshold *milliseconds*—Configure the threshold for the adaptation of the BFD session transmit interval. When the transmit interval adapts to a value greater than the threshold, a single trap and a single system message are sent. The interval threshold must be greater than the minimum transmit interval.

Range: 0 through 4,294,967,295 ($2^{32} - 1$)

transmit-interval minimum-interval *milliseconds*—Configure a minimum interval after which the local routing device transmits hello packets to a neighbor. Optionally, instead of using this statement, you can configure the minimum transmit interval using the **minimum-interval** statement.

Range: 1 through 255,000

version—Configure the BFD version to detect: **1** (BFD version 1) or **automatic** (autodetect the BFD version).

Default: **automatic**

Required Privilege Level routing—To view this statement in the configuration.
 routing-control—To add this statement to the configuration.

Related Documentation

- [Example: Configuring BFD for RIP on page 60](#)
- [Example: Configuring BFD Authentication for RIP on page 67](#)

check-zero

Syntax	(check-zero no-check-zero);
Hierarchy Level	<pre>[edit logical-systems <i>logical-system-name</i> protocols <i>rip</i>], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <i>rip</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>], [edit protocols <i>rip</i>], [edit protocols rip group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols <i>rip</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p>
Description	<p>Check whether the reserved fields in a RIP packet are zero:</p> <ul style="list-style-type: none">• check-zero—Discard version 1 packets that have nonzero values in the reserved fields and version 2 packets that have nonzero values in the fields that must be zero. This default behavior implements the RIP version 1 and version 2 specifications.• no-check-zero—Receive RIP version 1 packets with nonzero values in the reserved fields or RIP version 2 packets with nonzero values in the fields that must be zero. This is in spite of the fact that they are being sent in violation of the specifications in RFC 1058 and RFC 2453.
Default	check-zero
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	


demand-circuit (Protocols RIP)

Syntax	<code>demand-circuit;</code>
Hierarchy Level	<pre>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip group <i>group-name</i>], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</pre>
Release Information	Statement introduced in Release 11.1 of Junos OS.
Description	Configure a neighboring interface to act as a RIP demand circuit. To complete the demand circuit, you must configure both ends of the pair as demand circuits. When configured, the device sends RIP information only when changes occur in the routing database.
Default	Disabled. You must explicitly configure two neighboring interfaces to act as a RIP demand circuit.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIP Demand Circuits on page 55 • RIP Demand Circuits Overview on page 52 • max-retrans-time on page 210

dynamic-peers

Syntax	dynamic-peers;
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an interface to have dynamic peers in a point-to-multipoint RIP network.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring Point-to-Multipoint RIP Networks on page 86

export

Syntax	<code>export [<i>policy-names</i>];</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit protocols rip group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Apply a policy to routes being exported to the neighbors.</p> <p>By default, RIP does not export routes it has learned to its neighbors. To enable RIP to export routes, apply one or more export policies.</p> <p>If no routes match the policies, the local routing device does not export any routes to its neighbors. Export policies override any metric values determined through calculations involving the values configured with the metric-in and metric-out statements.</p>
<div>  <p>NOTE: The export policy on RIP does not support manipulating routing information of the next hop.</p> </div>	
Options	<i>policy-names</i> —Name of one or more policies.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> import on page 208

graceful-restart (Protocols RIP)

Syntax	<pre>graceful-restart { disable; restart-time <i>seconds</i>; }</pre>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip], [edit protocols rip]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	Configure graceful restart for RIP.
Options	disable —Disables graceful restart for RIP. The remaining statement is explained separately. See CLI Explorer .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS High Availability Library for Routing Devices</i>

group (Protocols RIP)

```
Syntax  group group-name {
        bfd-liveness-detection {
            authentication {
                algorithm algorithm-name;
                key-chain key-chain-name;
                loose-check;
            }
            detection-time {
                threshold milliseconds;
            }
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            transmit-interval {
                threshold milliseconds;
                minimum-interval milliseconds;
            }
            multiplier number;
            version (0 | 1 | automatic);
        }
        demand-circuit;
        export policy;
        max-retrans-time seconds;
        metric-out metric;
        preference number;
        route-timeout seconds;
        update-interval seconds;
        neighbor neighbor-name {
            authentication-key password;
            authentication-type type;
            bfd-liveness-detection {
                authentication {
                    algorithm algorithm-name;
                    key-chain key-chain-name;
                    loose-check;
                }
                detection-time {
                    threshold milliseconds;
                }
                minimum-interval milliseconds;
                minimum-receive-interval milliseconds;
                transmit-interval {
                    threshold milliseconds;
                    minimum-interval milliseconds;
                }
                multiplier number;
                version (0 | 1 | automatic);
            }
            (check-zero | no-check-zero);
            demand-circuit;
            import policy-name;
            max-retrans-time seconds;
            message-size number;
```

```
metric-in metric;  
metric-out metric;  
receive receive-options;  
route-timeout seconds;  
send send-options;  
update-interval seconds;  
}  
}
```

Hierarchy Level [edit logical-systems *logical-system-name* protocols [rip](#)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols [rip](#)],
[edit protocols [rip](#)],
[edit routing-instances *routing-instance-name* protocols [rip](#)]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure a set of RIP neighbors that share an export policy and metric. The export policy and metric govern what routes to advertise to neighbors in a given group. Each group must contain at least one neighbor. You should create a group for every export policy.

Options *group-name*—Name of a group, up to 16 characters long.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring RIP*

holddown (Protocols RIP)

Syntax	<code>holddown seconds;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series.</p>
Description	<p>Configure how long the expired route is retained in the routing table before being removed.</p> <p>When the hold-down timer runs on RIP demand circuits, routes are advertised as unreachable on other interfaces. When the hold-down timer expires, the route is removed from the routing table if all destinations detect that the route is unreachable or the remaining destinations are down.</p>
Options	<p>seconds—Estimated time to wait before making updates to the routing table. Range: 10 through 180 seconds Default: 180 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIP Timers on page 46 • RIP Demand Circuits Overview on page 52

import (Protocols RIP)

Syntax	<code>import [<i>policy-names</i>];</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols rip],</code> <code>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor</code> <code> <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> rip],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit protocols rip],</code> <code>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols rip],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor</code> <code> <i>neighbor-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Apply one or more policies to routes being imported by the local routing device from neighbors.
Options	<i>policy-names</i> —Name of one or more policies.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Applying Policies to RIP Routes Imported from Neighbors on page 93• Junos OS Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices• export on page 203

interface-type (Protocols RIP)

Syntax	interface-type p2mp;
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the type of interface in a RIP network. This statement enables a RIP device to have single or multiple peers through an interface.
Options	p2mp —Configure an interface in a RIP network as a point-to-multipoint interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring Point-to-Multipoint RIP Networks on page 86

max-retrans-time

Syntax	<code>max-retrans-time <i>seconds</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols rip group <i>group-name</i>],</p> <p>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	Statement introduced in Junos OS Release 11.1.
Description	<p>RIP demand circuits send update messages every 5 seconds to an unresponsive peer. Configure the retransmission timer to limit the number of times the demand circuit resends update messages to an unresponsive peer. If the configured retransmission threshold is reached, routes from the next hop router are marked as unreachable and the hold-down timer starts. You must configure a pair of RIP demand circuits for this timer to take effect.</p> <p>To determine the number of times to resend the update message, use the following calculation:</p> $5 \text{ seconds} \times \text{number of retransmissions} = \text{retransmission seconds}$
Options	<p>seconds—The total amount of time the demand circuit resends update messages to an unresponsive peer. The seconds range corresponds to sending an update message a minimum of 1 time (5 seconds) and a maximum of 36 times (180 seconds).</p> <p>Range: 5 through 180 seconds</p> <p>Default: 5 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIP Demand Circuits on page 55 • RIP Demand Circuits Overview on page 52 • demand-circuit on page 201

message-size

Syntax	<code>message-size <i>number</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols <i>rip</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <i>neighbor neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <i>rip</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <i>neighbor neighbor-name</i>],</p> <p>[edit protocols <i>rip</i>],</p> <p>[edit protocols rip group <i>group-name</i> <i>neighbor neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <i>rip</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <i>neighbor neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Specify the number of route entries to be included in every RIP update message. To ensure interoperability with other vendors' equipment, use the standard of 25 route entries per message.
Options	<p><i>number</i>—Number of route entries per update message.</p> <p>Range: 25 through 255 entries</p> <p>Default: 25 entries</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

metric-in (Protocols RIP)

Syntax	<code>metric-in <i>metric</i>;</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols <i>rip</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> protocols <i>rip</i> group <i>group-name</i> <i>neighbor</i></code> <code> <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> <i>rip</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> <i>rip</i> group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>],</code> <code>[edit protocols <i>rip</i>],</code> <code>[edit protocols <i>rip</i> group <i>group-name</i> <i>neighbor</i> <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols <i>rip</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols <i>rip</i> group <i>group-name</i> <i>neighbor</i></code> <code> <i>neighbor-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Specify the metric to add to incoming routes when the routing device advertises into RIP routes that were learned from other protocols. Use this statement to configure the routing device to prefer RIP routes learned through a specific neighbor.
Options	<i>metric</i> —Metric value. Range: 1 through 16 Default: 1
Required Privilege Level	<code>routing</code> —To view this statement in the configuration. <code>routing-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring the Metric Value Added to Imported RIP Routes on page 80

metric-out

Syntax	<code>metric-out <i>metric</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	Specify the metric value to add to routes transmitted to the neighbor. Use this statement to control how other routing devices prefer RIP routes sent from this neighbor.
Options	<p><i>metric</i>—Metric value.</p> <p>Range: 1 through 16</p> <p>Default: 1</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

neighbor

Syntax `neighbor neighbor-name {`
 `authentication-key password;`
 `authentication-type type;`
 `bfd-liveness-detection {`
 `authentication {`
 `algorithm algorithm-name;`
 `key-chain key-chain-name;`
 `loose-check;`
 `}`
 `detection-time {`
 `threshold milliseconds;`
 `}`
 `minimum-interval milliseconds;`
 `minimum-receive-interval milliseconds;`
 `transmit-interval {`
 `threshold milliseconds;`
 `minimum-interval milliseconds;`
 `}`
 `multiplier number;`
 `version (0 | 1 | automatic);`
 `}`
 `(check-zero | no-check-zero);`
 `demand-circuit;`
 `import policy-name;`
 `max-retrans-time seconds;`
 `message-size number;`
 `metric-in metric;`
 `metric-out metric;`
 `receive receive-options;`
 `route-timeout seconds;`
 `send send-options;`
 `update-interval seconds;`
 `}`

Hierarchy Level [edit logical-systems *logical-system-name* protocols rip **group** *group-name*],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols
 rip **group** *group-name*],
 [edit protocols rip **group** *group-name*],
 [edit routing-instances *routing-instance-name* protocols rip **group** *group-name*]

Release Information Statement introduced before Junos OS Release 7.4.
 Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure neighbor-specific RIP parameters, thereby overriding the defaults set for the routing device.

Options *neighbor-name*—Name of an interface over which a routing device communicates to its neighbors.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege	routing—To view this statement in the configuration.
Level	routing-control—To add this statement to the configuration.

peer (Protocols RIP)

Syntax	<code>peer <i>IP address</i>;</code>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure a static peer for an interface in a point-to-multipoint RIP network.
Options	<i>address</i> —IP address of the static peer to be configured.
Required Privilege	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring Point-to-Multipoint RIP Networks on page 86

preference (Protocols RIP)

Syntax	<code>preference <i>preference</i>;</code>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>], [edit protocols rip group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches.
Description	<p>Specify the preference of external routes learned by RIP as compared to those learned from other routing protocols.</p> <p>By default, Junos OS assigns a preference of 100 to routes that originate from RIP. When Junos OS determines a route's preference to become the active route, the software selects the route with the lowest preference and installs this route into the forwarding table.</p>
Options	<p><i>preference</i>—Preference value. A lower value indicates a more preferred route.</p> <p>Range: 0 through 4,294,967,295 ($2^{32} - 1$)</p> <p>Default: 100</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Route Preferences Overview</i>

receive (Protocols RIP)

Syntax	<code>receive receive-options;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Configure RIP receive options.
Options	<p>receive-options—One of the following:</p> <ul style="list-style-type: none"> both—Accept both RIP version 1 and version 2 packets. none—Do not receive RIP packets. version-1—Accept only RIP version 1 packets. version-2—Accept only RIP version 2 packets. <p>Default: both</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101 send on page 223

rib-group (Protocols RIP)

Syntax	<code>rib-group <i>group-name</i>;</code>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Install RIP routes into multiple routing tables by configuring a routing table group.
Options	<i>group-name</i> —Name of the routing table group.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Redistributing Routes Between Two RIP Instances on page 108

rip

Syntax	rip {...}
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols], [edit protocols], [edit routing-instances <i>routing-instance-name</i> protocols]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Enable RIP routing on the routing device.
Default	RIP is disabled on the routing device.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring RIP</i>

route-timeout (Protocols RIP)

Syntax	<code>route-timeout seconds;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols rip],</p> <p>[edit protocols rip group <i>group-name</i>],</p> <p>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 7.6.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Configure the route timeout interval for RIP. If a route is not refreshed after being installed in the routing table by the specified timeout interval, the route is marked as invalid and is removed from the routing table after the hold-down period expires.
Options	<p>seconds—Estimated time to wait before making updates to the routing table.</p> <p>Range: 30 through 360 seconds</p> <p>Default: 180 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIP Timers on page 46 • RIP Demand Circuits Overview on page 52

routing-instances (Multiple Routing Entities)

Syntax	<code>routing-instances <i>routing-instance-name</i> { ... }</code>
Hierarchy Level	<code>[edit],</code> <code>[edit logical-systems <i>logical-system-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. remote-vtep-v6-list statement introduced in Junos OS Release 17.3 for MX Series routers with MPC and MIC interfaces.
Description	<p>Configure an additional routing entity for a router. You can create multiple instances of BGP, IS-IS, OSPF, OSPFv3, and RIP for a router. You can also create multiple routing instances for separating routing tables, routing policies, and interfaces for individual wholesale subscribers (retailers) in a Layer 3 wholesale network.</p> <p>Each routing instance consist of the following:</p> <ul style="list-style-type: none"> • A set of routing tables • A set of interfaces that belong to these routing tables • A set of routing option configurations <p>Each routing instance has a unique name and a corresponding IP unicast table. For example, if you configure a routing instance with the name my-instance, its corresponding IP unicast table is <code>my-instance.inet.0</code>. All routes for my-instance are installed into <code>my-instance.inet.0</code>.</p> <p>Routes are installed into the default routing instance <code>inet.0</code> by default, unless a routing instance is specified.</p> <p>In Junos OS Release 9.0 and later, you can no longer specify a routing-instance name of <i>master</i>, <i>default</i>, or <i>bgp</i> or include special characters within the name of a routing instance.</p> <p>In Junos OS Release 9.6 and later, you can include a slash (/) in a routing-instance name only if a logical system is not configured. That is, you cannot include the slash character in a routing-instance name if a logical system other than the default is explicitly configured. Routing-instance names, further, are restricted from having the form <code>__.*__</code> (beginning and ending with underscores). The colon : character cannot be used when multitopology routing (MTR) is enabled.</p>
Default	Routing instances are disabled for the router.
Options	<p><i>routing-instance-name</i>—Name of the routing instance. This must be a non-reserved string of not more than 128 characters.</p> <p>remote-vtep-list—Configure static remote VXLAN tunnel endpoints.</p> <p>remote-vtep-v6-list—Configure static IPv6 remote VXLAN tunnel endpoints.</p>

Required Privilege routing—To view this statement in the configuration.
Level routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Interprovider Layer 3 VPN Option A*
- *Example: Configuring Interprovider Layer 3 VPN Option B*
- *Example: Configuring Interprovider Layer 3 VPN Option C*

send (Protocols RIP)

Syntax	<code>send <i>send-options</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Configure RIP send options.
Options	<p><i>send-options</i>—One of the following:</p> <ul style="list-style-type: none"> broadcast—Broadcast RIP version 2 packets (RIP version 1 compatible). multicast—Multicast RIP version 2 packets. This is the default. none—Do not send RIP updates. version-1—Broadcast RIP version 1 packets. <p>Default: multicast</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 101 receive on page 217

traceoptions (Protocols RIP)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <size <i>size</i>> <world-readable no-world-readable>; flag <i>flag</i> <flag-modifier> <disable>; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip],</p> <p>[edit protocols rip],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Set RIP protocol-level tracing options.



NOTE: The **traceoptions** statement is not supported on QFabric systems.

Default	The default RIP protocol-level trace options are inherited from the global traceoptions statement.
Options	<p>disable—(Optional) Disable the tracing operation. One use of this option is to disable a single operation when you have defined a broad group of tracing operations, such as all.</p> <p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name in quotation marks. We recommend that you place RIP tracing output in the file <code>/var/log/rip-log</code>.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum number of files, you must also specify a maximum file size with the size option.</p> <p>Range: 2 through 1000 files</p> <p>Default: 10 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements.</p>

RIP Tracing Options

- **auth**—RIP authentication
- **error**—RIP error packets
- **expiration**—RIP route expiration processing
- **holddown**—RIP hold-down processing
- **nsr-synchronization**—Nonstop routing synchronization events
- **packets**—All RIP packets
- **request**—RIP information packets such as request, poll, and poll entry packets
- **trigger**—RIP triggered updates
- **update**—RIP update packets

Global Tracing Options

- **all**—All tracing operations
- **general**—A combination of the **normal** and **route** trace operations
- **normal**—All normal operations

Default: If you do not specify this option, only unusual or abnormal operations are traced.

- **policy**—Policy operations and actions
- **route**—Routing table changes
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing

flag-modifier—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

- **detail**—Provide detailed trace information.
- **receive**—Trace the packets being received.
- **receive-detail**—Provide detailed trace information for packets being received.
- **send**—Trace the packets being transmitted.
- **send-detail**—Provide detailed trace information for packets being transmitted.

no-world-readable—(Optional) Prevent any user from reading the log file.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB) or megabytes (MB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum file size, you must also specify a maximum number of trace files with the **files** option.

Syntax: *xk* to specify KB, *xm* to specify MB, or *xg* to specify GB

Range: 10 KB through the maximum file size supported on your system

Default: 128 KB

world-readable—(Optional) Allow any user to read the log file.

Required Privilege	routing—To view this statement in the configuration.
Level	routing-control—To add this statement to the configuration.

Related Documentation	<ul style="list-style-type: none">• Example: Tracing RIP Protocol Traffic on page 116
------------------------------	---

update-interval (Protocols RIP)

Syntax	<code>update-interval seconds;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols rip], [edit protocols rip group <i>group-name</i>], [edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 7.6. Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 12.1 for the QFX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Configure the interval at which routes learned by RIP are sent to neighbors. This timer controls the interval between routing updates. This timer is set to 30 seconds, by default, with a small random amount of time added when the timer is reset. This added time prevents congestion that can happen if all routing devices update their neighbors simultaneously.
Options	<p>seconds—Estimated time to wait before making updates to the routing table. Range: 10 through 60 seconds Default: 30 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIP Timers on page 46

CHAPTER 21

RIPng Configuration Statements

- [export \(Protocols RIPng\) on page 230](#)
- [graceful-restart \(Protocols RIPng\) on page 231](#)
- [group \(Protocols RIPng\) on page 232](#)
- [holddown \(Protocols RIPng\) on page 233](#)
- [import \(Protocols RIPng\) on page 234](#)
- [metric-in \(Protocols RIPng\) on page 235](#)
- [metric-out \(Protocols RIPng\) on page 236](#)
- [neighbor \(Protocols RIPng\) on page 237](#)
- [preference \(Protocols RIPng\) on page 238](#)
- [receive \(Protocols RIPng\) on page 239](#)
- [ripng on page 240](#)
- [route-timeout \(Protocols RIPng\) on page 241](#)
- [routing-instances \(Multiple Routing Entities\) on page 242](#)
- [send \(Protocols RIPng\) on page 243](#)
- [traceoptions \(Protocols RIPng\) on page 244](#)
- [update-interval \(Protocols RIPng\) on page 246](#)

export (Protocols RIPng)

Syntax	<code>export [<i>policy-names</i>];</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code>ripng group <i>group-name</i>],</code> <code>[edit protocols ripng group <i>group-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	<p>Apply a policy or list of policies to routes being exported to the neighbors.</p> <p>By default, RIPng does not export routes it has learned to its neighbors. To have RIPng export routes, apply one or more export policies. To apply export policies and to filter routes being exported from the local routing device to its neighbors, include the export statement and list the name of the policy to be evaluated.</p> <p>You can define one or more export policies. If no routes match the policies, the local routing device does not export any routes to its neighbors. Export policies override any metric values determined through calculations involving the values configured with the metric-in and metric-out statements.</p>
Options	<i>policy-names</i> —Name of one or more policies.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• import on page 234

graceful-restart (Protocols RIPng)

Syntax	<pre>graceful-restart { disable; restart-time <i>seconds</i>; }</pre>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	Configure graceful restart for RIPng.
Options	disable —Disables graceful restart for RIPng. The remaining statement is explained separately. See CLI Explorer .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS High Availability Library for Routing Devices</i>

group (Protocols RIPvng)

Syntax	<pre>group <i>group-name</i> { export [<i>policy-names</i>]; metric-out <i>metric</i>; neighbor <i>neighbor-name</i> { import <i>policy-name</i>; metric-in <i>metric</i>; receive <none>; route-timeout <i>seconds</i>; send <none>; update-interval <i>seconds</i>; } preference <i>number</i>; route-timeout <i>seconds</i>; update-interval <i>seconds</i>; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.</p>
Description	<p>Configure a set of RIPvng neighbors that share an export policy and metric. The export policy and metric govern what routes to advertise to neighbors in a given group.</p> <p>Each group must contain at least one neighbor. You should create a group for each export policy that you have.</p>
Options	<p><i>group-name</i>—Name of a group, up to 16 characters long.</p> <p>The remaining statements are explained separately. See CLI Explorer.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.</p>

holddown (Protocols RIPng)

Syntax	<code>holddown seconds;</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols ripng],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],</code> <code>[edit protocols ripng],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols ripng]</code>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Support for routing instances introduced in Junos OS Release 9.0.</p>
Description	Configure how long the expired route is retained in the routing table before being removed.
Options	<p>seconds—Estimated time to wait before removing expired routes from the routing table.</p> <p>Default: 180 seconds</p> <p>Range: 10 through 180 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIPng Update Interval on page 154

import (Protocols RIPng)

Syntax	<code>import [<i>policy-names</i>];</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols ripng],</code> <code>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> neighbor</code> <code> <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> ripng],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code> <code> ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit protocols ripng],</code> <code>[edit protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols ripng],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor</code> <code> <i>neighbor-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	Apply one or more policies to routes being imported into the local routing device from its neighbors.
Options	<i>policy-names</i> —Name of one or more policies.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Applying Policies to RIPng Routes Imported from Neighbors on page 131• export on page 230

metric-in (Protocols RIPng)

Syntax	<code>metric-in <i>metric</i>;</code>
Hierarchy Level	<pre>[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols ripng], [edit protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Support for routing instances introduced in Junos OS Release 9.0.</p>
Description	Specify the metric to add to incoming routes when advertising into RIPng routes that were learned from other protocols. Use this statement to configure the routing device to prefer RIPng routes learned through a specific neighbor.
Options	<p><i>metric</i>—Metric value.</p> <p>Range: 1 through 16</p> <p>Default: 1</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring the Metric Value Added to Imported RIPng Routes to Control the Route Selection Process on page 146

metric-out (Protocols RIPng)

Syntax	<code>metric-out <i>metric</i>;</code>
Hierarchy Level	<code>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</code> <code>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	<p>Specify the metric value to add to routes transmitted to the neighbor. Use this statement to control how other routing devices prefer RIPng routes sent from this neighbor.</p> <p>When an export policy is configured, RIPng exports all learned routes to neighbors configured with the neighbor statement.</p> <p>If a route being exported was learned from a member of the same RIPng group, the metric associated with that route (unless modified by an export policy) is the normal RIPng metric. For example, a RIPng route with a metric of 5 learned from a neighbor configured with a metric-in value of 2 is advertised with a combined metric of 7 when advertised to RIPng neighbors in the same group. However, if this route was learned from a RIPng neighbor in a different group or from a different protocol, the route is advertised with the metric value configured for that group with the metric-out statement. The default value for metric-out is 1.</p> <p>To modify the metric for routes advertised outside a group, include the metric-out statement.</p>
Options	metric —Metric value. Range: 1 through 16 Default: 1
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring the Metric Value Added to Imported RIPng Routes to Control the Route Selection Process on page 146• Understanding RIPng Traffic Control with Metrics for Optimizing the Path Cost on page 145

neighbor (Protocols RIPng)

Syntax	<pre>neighbor <i>neighbor-name</i> { import [<i>policy-names</i>]; metric-in <i>metric</i>; receive <none>; route-timeout <i>seconds</i>; send <none>; update-interval <i>seconds</i>; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>],</p> <p>[edit protocols ripng group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Support for routing instances introduced in Junos OS Release 9.0.</p>
Description	Configure neighbor-specific RIPng parameters, thereby overriding the defaults set for the routing device.
Options	<p><i>neighbor-name</i>—Name of an interface over which a routing device communicates to its neighbors.</p> <p>The remaining statements are explained separately. See CLI Explorer.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

preference (Protocols RIPng)

Syntax	<code>preference <i>preference</i>;</code>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>], [edit protocols ripng group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	<p>Specify the preference of external routes learned by RIPng as compared to those learned from other routing protocols.</p> <p>By default, Junos OS assigns a preference of 100 to routes that originate from RIPng. When Junos OS determines that a route is to become the active route, the software selects the route with the lowest preference and installs this route into the forwarding table.</p> <p>To modify the default RIPng preference value, include the preference statement.</p>
Options	<p>preference—Preference value. A lower value indicates a more preferred route.</p> <p>Range: 0 through 4,294,967,295 ($2^{32} - 1$)</p> <p>Default: 100</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

receive (Protocols RIPng)

Syntax	receive <none>;
Hierarchy Level	<pre>[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit protocols ripng], [edit protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Support for routing instances introduced in Junos OS Release 9.0.</p>
Description	Enable or disable receiving of update messages.
Options	<p>none—(Optional) Disable receiving update messages.</p> <p>Default: Enabled</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • send on page 243

ripng

Syntax	ripng {...}
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols], [edit protocols], [edit routing-instances <i>routing-instance-name</i> protocols]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	Enable RIPng routing on the routing device.
Default	RIPng is disabled on the routing device.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

route-timeout (Protocols RIPng)

Syntax	<code>route-timeout <i>seconds</i>;</code>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng]
Release Information	Statement introduced in Junos OS Release 7.6. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	Configure the route timeout interval for RIPng.
Options	<i>seconds</i> —Estimated time to wait before making updates to the routing table. Range: 30 through 360 seconds Default: 180 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring RIPng Update Interval on page 154

routing-instances (Multiple Routing Entities)

Syntax	<code>routing-instances <i>routing-instance-name</i> { ... }</code>
Hierarchy Level	<code>[edit],</code> <code>[edit logical-systems <i>logical-system-name</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. remote-vtep-v6-list statement introduced in Junos OS Release 17.3 for MX Series routers with MPC and MIC interfaces.
Description	<p>Configure an additional routing entity for a router. You can create multiple instances of BGP, IS-IS, OSPF, OSPFv3, and RIP for a router. You can also create multiple routing instances for separating routing tables, routing policies, and interfaces for individual wholesale subscribers (retailers) in a Layer 3 wholesale network.</p> <p>Each routing instance consist of the following:</p> <ul style="list-style-type: none">• A set of routing tables• A set of interfaces that belong to these routing tables• A set of routing option configurations <p>Each routing instance has a unique name and a corresponding IP unicast table. For example, if you configure a routing instance with the name my-instance, its corresponding IP unicast table is <code>my-instance.inet.0</code>. All routes for my-instance are installed into <code>my-instance.inet.0</code>.</p> <p>Routes are installed into the default routing instance <code>inet.0</code> by default, unless a routing instance is specified.</p> <p>In Junos OS Release 9.0 and later, you can no longer specify a routing-instance name of <i>master</i>, <i>default</i>, or <i>bgp</i> or include special characters within the name of a routing instance.</p> <p>In Junos OS Release 9.6 and later, you can include a slash (/) in a routing-instance name only if a logical system is not configured. That is, you cannot include the slash character in a routing-instance name if a logical system other than the default is explicitly configured. Routing-instance names, further, are restricted from having the form <code>__.*__</code> (beginning and ending with underscores). The colon <code>:</code> character cannot be used when multitopology routing (MTR) is enabled.</p>
Default	Routing instances are disabled for the router.
Options	<p><i>routing-instance-name</i>—Name of the routing instance. This must be a non-reserved string of not more than 128 characters.</p> <p>remote-vtep-list—Configure static remote VXLAN tunnel endpoints.</p> <p>remote-vtep-v6-list—Configure static IPv6 remote VXLAN tunnel endpoints.</p>

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Interprovider Layer 3 VPN Option A*
- *Example: Configuring Interprovider Layer 3 VPN Option B*
- *Example: Configuring Interprovider Layer 3 VPN Option C*

send (Protocols RIPng)

Syntax send <none>;

Hierarchy Level [edit logical-systems *logical-system-name* protocols ripng],
[edit logical-systems *logical-system-name* protocols ripng group *group-name* **neighbor** *neighbor-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instances-name* protocols ripng],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols ripng group *group-name* neighbor *neighbor-name*],
[edit protocols ripng],
[edit protocols ripng group *group-name* **neighbor** *neighbor-name*],
[edit routing-instances *routing-instance-name* protocols ripng],
[edit routing-instances *routing-instance-name* protocols ripng group *group-name* neighbor *neighbor-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Support for routing instances introduced in Junos OS Release 9.0.

Description Enable or disable sending of update messages.

Options none—(Optional) Disable sending of update messages.
Default: Enabled

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [receive on page 239](#)

traceoptions (Protocols RIPng)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <size <i>size</i>> <world-readable no-world-readable>; flag <i>flag</i> <flag-modifier> <disable>; }</pre>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> protocols ripng], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng], [edit protocols ripng], [edit routing-instances <i>routing-instance-name</i> protocols ripng]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for routing instances introduced in Junos OS Release 9.0.
Description	Set RIPng protocol-level tracing options.
Default	The default RIPng protocol-level trace options are inherited from the global traceoptions statement.
Options	<p>disable—(Optional) Disable the tracing operation. One use of this option is to disable a single operation when you have defined a broad group of tracing operations, such as all.</p> <p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name in quotation marks. We recommend that you place RIPng tracing output in the file <code>/var/log/ripng-log</code>.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum number of files, you must also specify a maximum file size with the size option.</p> <p>Range: 2 through 1000 files</p> <p>Default: 10 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements.</p> <p>RIPng Tracing Options</p> <ul style="list-style-type: none">• error—RIPng error packets• expiration—RIPng route expiration processing• holddown—RIPng hold-down processing• nsr-synchronization—Nonstop routing synchronization events

- **packets**—All RIPng packets
- **request**—RIPng information packets such as request, poll, and poll entry packets
- **trigger**—RIPng triggered updates
- **update**—RIPng update packets

Global Tracing Options

- **all**—All tracing operations
- **general**—A combination of the **normal** and **route** trace operations
- **normal**—All normal operations

Default: If you do not specify this option, only unusual or abnormal operations are traced.

- **policy**—Policy operations and actions
- **route**—Routing table changes
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing

flag-modifier—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

- **detail**—Provide detailed trace information.
- **receive**—Trace the packets being received.
- **receive-detail**—Provide detailed trace information for packets being received.
- **send**—Trace the packets being transmitted.
- **send-detail**—Provide detailed trace information for packets being transmitted.

no-world-readable—(Optional) Do not allow any user to read the log file.

size size—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum file size, you must also specify a maximum number of trace files with the **files** option.

Syntax: **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

Range: 10 KB through the maximum file size supported on your system

Default: 128 KB

world-readable—(Optional) Allow any user to read the log file.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Example: Tracing RIPv6 Protocol Traffic on page 166](#)

update-interval (Protocols RIPv6)

Syntax update-interval *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols rIPv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols rIPv6],
[edit protocols rIPv6],
[edit routing-instances *routing-instance-name* protocols rIPv6]

Release Information Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Support for routing instances introduced in Junos OS Release 9.0.

Description Configure the interval at which routes learned by RIPv6 are sent to neighbors.

Options *seconds*—Estimated time to wait before making updates to the routing table.
Range: 10 through 60 seconds
Default: 30 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Example: Configuring RIP Timers on page 46](#)

CHAPTER 22

RIP Operational Commands

- clear rip general-statistics
- clear rip statistics
- restart
- show policy
- show policy conditions
- show rip general-statistics
- show rip neighbor
- show rip statistics
- show route
- show route active-path
- show route advertising-protocol
- show route all
- show route best
- show route brief
- show route detail
- show route exact
- show route export
- show route extensive
- show route forwarding-table
- show route hidden
- show route inactive-path
- show route instance
- show route next-hop
- show route output
- show route protocol
- show route receive-protocol
- show route table

- `show route terse`
- `test policy`

clear rip general-statistics

List of Syntax	Syntax on page 249 Syntax (EX Series Switches and QFX Series) on page 249
Syntax	clear rip general-statistics <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switches and QFX Series)	clear rip general-statistics
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 12.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Clear RIP general statistics.
Options	none —Clear RIP general statistics. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show rip general-statistics on page 267
List of Sample Output	clear rip general-statistics on page 249
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear rip general-statistics

```
user@host> clear rip general-statistics
```

clear rip statistics

List of Syntax	Syntax on page 250 Syntax (EX Series Switches and QFX Series) on page 250
Syntax	<code>clear rip statistics</code> <code><instance (all <i>instance-name</i>)></code> <code><logical-system (all <i>logical-system-name</i>)></code> <code><neighbor></code> <code><peer (all <i>address</i>)></code>
Syntax (EX Series Switches and QFX Series)	<code>clear rip statistics</code> <code><instance (all <i>instance-name</i>)></code> <code><neighbor></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 12.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Clear RIP statistics.
Options	none —Reset RIP counters for all neighbors for all routing instances. instance (all <i>instance-name</i>) —(Optional) Clear RIP statistics for all instances or for the specified routing instance only. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. neighbor —(Optional) Clear RIP statistics for the specified neighbor only. peer (all <i>address</i>) —(Optional) Clear RIP statistics for a single peer or all peers.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show rip statistics on page 271
List of Sample Output	clear rip statistics on page 250
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear rip statistics

```
user@host> clear rip statistics
```


restart

List of Syntax [Syntax on page 252](#)

[Syntax \(ACX Series Routers\) on page 252](#)

[Syntax \(EX Series Switches\) on page 252](#)

[Syntax \(MX Series Routers\) on page 253](#)

[Syntax \(QFX Series\) on page 253](#)

[Syntax \(Routing Matrix\) on page 253](#)

[Syntax \(TX Matrix Routers\) on page 253](#)

[Syntax \(TX Matrix Plus Routers\) on page 254](#)

[Syntax \(QFX Series\) on page 254](#)

Syntax **restart**

```
<adaptive-services | ancpd-service | application-identification | audit-process |
  auto-configuration | captive-portal-content-delivery | ce-l2tp-service | chassis-control |
  class-of-service | clksyncd-service | database-replication | datapath-trace-service
  | dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
  ecc-error-logging | ethernet-connectivity-fault-management
  | ethernet-link-fault-management | event-processing | firewall
  | general-authentication-service | gracefully | iccp-service | idp-policy | immediately
  | interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
  | l2tp-service | l2tp-universal-edge | lacp | license-service | link-management
  | local-policy-decision-function | mac-validation | mib-process | mounstd-service
  | mpls-traceroute | mspd | multicast-snooping | named-service | nfsd-service |
  packet-triggered-subscribers | peer-selection-service | pgm | pic-services-logging | pki-service
  | ppp | ppp-service | pppoe | protected-system-domain-service |
  redundancy-interface-process | remote-operations | root-system-domain-service | routing
  <logical-system logical-system-name> | sampling | sbc-configuration-process | sdk-service
  | service-deployment | services | snmp | soft | static-subscribers | statistics-service |
  subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control |
  vrrp | web-management>
<gracefully | immediately | soft>
```

Syntax (ACX Series Routers)

```
restart
<adaptive-services | audit-process | auto-configuration | autoinstallation | chassis-control |
  class-of-service | clksyncd-service | database-replication | dhcp-service | diameter-service
  | disk-monitoring | dynamic-flow-capture | ethernet-connectivity-fault-management
  | ethernet-link-fault-management | event-processing | firewall
  | general-authentication-service | gracefully | immediately | interface-control |
  ipsec-key-management | l2-learning | lacp | link-management | mib-process | mounstd-service
  | mpls-traceroute | mspd | named-service | nfsd-service | pgm | pki-service | ppp | pppoe |
  redundancy-interface-process | remote-operations | routing | sampling | sdk-service
  | secure-neighbor-discovery | service-deployment | services | snmp | soft | statistics-service |
  subscriber-management | subscriber-management-helper | tunnel-oamd | vrrp>
```

Syntax (EX Series Switches)

```
restart
<autoinstallation | chassis-control | class-of-service | database-replication | dhcp |
  dhcp-service | diameter-service | dot1x-protocol | ethernet-link-fault-management |
  ethernet-switching | event-processing | firewall | general-authentication-service |
  interface-control | kernel-replication | l2-learning | lacp | license-service | link-management
  | lldpd-service | mib-process | mounstd-service | multicast-snooping | pgm |
```


redundancy-interface-process | remote-operations | routing | secure-neighbor-discovery
| service-deployment | sflow-service | snmp | vrrp | web-management>

Syntax (MX Series Routers) restart
 <adaptive-services | ancpd-service | application-identification | audit-process |
 auto-configuration | captive-portal-content-delivery | ce-l2tp-service | chassis-control |
 class-of-service | clksyncd-service | database-replication | datapath-trace-service
 | dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
 ecc-error-logging | ethernet-connectivity-fault-management
 | ethernet-link-fault-management | event-processing | firewall |
 general-authentication-service | gracefully | iccp-service | idp-policy | immediately
 | interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
 | l2tp-service | l2tp-universal-edge | lacp | license-service | link-management
 | local-policy-decision-function | mac-validation | mib-process | mounstd-service
 | mpls-traceroute | mspd | multicast-snooping | named-service | nfsd-service |
 packet-triggered-subscribers | peer-selection-service | pgm | pic-services-logging |
 pki-service | ppp | ppp-service | pppoe | protected-system-domain-service |
 redundancy-interface-process | remote-operations | root-system-domain-service | routing
 | routing <logical-system *logical-system-name*> | sampling | sbc-configuration-process |
 sdk-service | service-deployment | services | snmp | soft | static-subscribers | statistics-service |
 subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control |
 vrrp | web-management>
 <all-members>
 <gracefully | immediately | soft>
 <local>
 <member *member-id*>

Syntax (QFX Series) restart
 <adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
 diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall
 | general-authentication-service | igmp-host-services | interface-control |
 ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
 named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
 redundancy-interface-process | remote-operations | *logical-system-name*> | routing |
 sampling | secure-neighbor-discovery | service-deployment | snmp | usb-control |
 web-management>
 <gracefully | immediately | soft>

Syntax (Routing Matrix) restart
 <adaptive-services | audit-process | chassis-control | class-of-service | disk-monitoring |
 dynamic-flow-capture | ecc-error-logging | event-processing | firewall | interface-control
 | ipsec-key-management | kernel-replication | l2-learning | l2tp-service | lacp |
 link-management | mib-process | pgm | pic-services-logging | ppp | pppoe |
 redundancy-interface-process | remote-operations | routing <logical-system
logical-system-name> | sampling | service-deployment | snmp>
 <all | all-lcc | lcc *number*>
 <gracefully | immediately | soft>

Syntax (TX Matrix Routers) restart
 <adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
 diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
 event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
 | l2-learning | l2tp-service | lacp | link-management | mib-process | pgm | pic-services-logging

	<p> ppp pppoe redundancy-interface-process remote-operations routing <logical-system <i>logical-system-name</i>> sampling service-deployment snmp statistics-service></p> <p><all-chassis all-lcc lcc <i>number</i> scc></p> <p><gracefully immediately soft></p>
Syntax (TX Matrix Plus Routers)	<p>restart</p> <p><adaptive-services audit-process chassis-control class-of-service dhcp-service diameter-service disk-monitoring dynamic-flow-capture ecc-error-logging event-processing firewall interface-control ipsec-key-management kernel-replication l2-learning l2tp-service lacp link-management mib-process pgm pic-services-logging ppp pppoe redundancy-interface-process remote-operations routing <logical-system <i>logical-system-name</i>> sampling service-deployment snmp statistics-service></p> <p><all-chassis all-lcc all-sfc lcc <i>number</i> sfc <i>number</i>></p> <p><gracefully immediately soft></p>
Syntax (QFX Series)	<p>restart</p> <p><adaptive-services audit-process chassis-control class-of-service dialer-services diameter-service dlsf ethernet-connectivity event-processing fibre-channel firewall general-authentication-service igmp-host-services interface-control ipsec-key-management isdn-signaling l2ald l2-learning l2tp-service mib-process named-service network-access-service nstrace-process pgm ppp pppoe redundancy-interface-process remote-operations <i>logical-system-name</i>> routing sampling secure-neighbor-discovery service-deployment snmp usb-control web-management></p> <p><gracefully immediately soft></p>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Options added:</p> <ul style="list-style-type: none"> • dynamic-flow-capture in Junos OS Release 7.4. • dlsf in Junos OS Release 7.5. • event-processing in Junos OS Release 7.5. • ppp in Junos OS Release 7.5. • l2ald in Junos OS Release 8.0. • link-management in Release 8.0. • pgcp-service in Junos OS Release 8.4. • sbc-configuration-process in Junos OS Release 9.5. • services pgcp gateway in Junos OS Release 9.6. • sfc and all-sfc for the TX Matrix Router in Junos OS Release 9.6.
Description	Restart a Junos OS process.



CAUTION: Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router or switch to drop calls and interrupt transmission, resulting in possible loss of data.

Options **none**—Same as **gracefully**.

adaptive-services—(Optional) Restart the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Restart the software process on all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process on all T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process on all T1600 routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Restart the software process for all members of the Virtual Chassis configuration.

all-sfc—(TX Matrix Plus routers only) (Optional) For a TX Matrix Plus router, restart the software processes for the TX Matrix Plus router (or switch-fabric chassis).

ancpd-service—(Optional) Restart the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

application-identification—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based on the amount of time or type of services accessed.

auto-configuration—(Optional) Restart the Interface Auto-Configuration process.

autoinstallation—(EX Series switches only) (Optional) Restart the autoinstallation process.

captive-portal-content-delivery—(Optional) Restart the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

chassis-control—(Optional) Restart the chassis management process.

class-of-service—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

clksyncd-service—(Optional) Restart the external clock synchronization process, which uses synchronous Ethernet (SyncE).

database-replication—(EX Series switches and MX Series routers only) (Optional) Restart the database replication process.

dapath-trace-service—(Optional) Restart the packet path tracing process.

dhcp—(EX Series switches only) (Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.

dhcp-service—(Optional) Restart the Dynamic Host Configuration Protocol process.

dialer-services—(EX Series switches only) (Optional) Restart the ISDN dial-out process.

diameter-service—(Optional) Restart the diameter process.

disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

dls—(QFX Series only) (Optional) Restart the data link switching (DLSw) service.

dot1x-protocol—(EX Series switches only) (Optional) Restart the port-based network access control process.

dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

ecc-error-logging—(Optional) Restart the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

ethernet-switching—(EX Series switches only) (Optional) Restart the Ethernet switching process.

event-processing—(Optional) Restart the event process (eventd).

fibre-channel—(QFX Series only) (Optional) Restart the Fibre Channel process.

firewall—(Optional) Restart the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Restart the general authentication process.

gracefully—(Optional) Restart the software process.

iccp-service—(Optional) Restart the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.

immediately—(Optional) Immediately restart the software process.

interface-control—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

ipsec-key-management—(Optional) Restart the IPsec key management process.

isdn-signaling—(QFX Series only) (Optional) Restart the ISDN signaling process, which initiates ISDN connections.

kernel-replication—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Restart the Layer 2 address flooding and learning process.

l2cpd-service—(Optional) Restart the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

l2tp-service—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Layer 2 Tunneling Protocol (L2TP) process, which sets up client services for establishing Point-to-Point Protocol (PPP) tunnels across a network and negotiating Multilink PPP if it is implemented.

l2tp-universal-edge—(MX Series routers only) (Optional) Restart the L2TP process, which establishes L2TP tunnels and PPP sessions through L2TP tunnels.

lACP—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc number—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process for a specific T640 router that is connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

license-service—(EX Series switches only) (Optional) Restart the feature license management process.

link-management— (TX Matrix and TX Matrix Plus routers and EX Series switches only) (Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.

lldpd-service—(EX Series switches only) (Optional) Restart the Link Layer Discovery Protocol (LLDP) process.

local—(MX Series routers only) (Optional) Restart the software process for the local Virtual Chassis member.

local-policy-decision-function— (Optional) Restart the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

mac-validation— (Optional) Restart the Media Access Control (MAC) validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

member *member-id*—(MX Series routers only) (Optional) Restart the software process for a specific member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

mib-process—(Optional) Restart the Management Information Base (MIB) version II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Restart the Mobile IP process, which configures Junos OS Mobile IP features.

mountd-service—(EX Series switches and MX Series routers only) (Optional) Restart the service for NFS mount requests.

mpls-traceroute—(Optional) Restart the MPLS Periodic Traceroute process.

mspd—(Optional) Restart the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Restart the multicast snooping process, which makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

network-access-service—(QFX Series only) (Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.

nfsd-service—(Optional) Restart the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

packet-triggered-subscribers—(Optional) Restart the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Restart the Peer Selection Service process.

pgcp-service—(Optional) Restart the pgcpd service process running on the Routing Engine. This option does not restart pgcpd processes running on mobile station PICs. To restart pgcpd processes running on mobile station PICs, use the **services pgcp gateway** option.

pgm—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.

pic-services-logging—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

pki-service—(Optional) Restart the PKI Service process.

ppp—(Optional) Restart the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—(Optional) Restart the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

pppoe—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

protected-system-domain-service—(Optional) Restart the Protected System Domain (PSD) process.

redundancy-interface-process—(Optional) Restart the ASP redundancy process.

remote-operations—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.

root-system-domain-service—(Optional) Restart the Root System Domain (RSD) service.

routing—(ACX Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the routing protocol process.

routing <logical-system *logical-system-name*>—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router or switch and maintains the routing tables. Optionally, restart the routing protocol process for the specified logical system only.

sampling—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—(Optional) Restart the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Restart the software process on the TX Matrix router (or switch-card chassis).

sdk-service—(Optional) Restart the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

sfc *number*—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

service-deployment—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

services—(Optional) Restart a service.

services pgcp gateway *gateway-name*—(Optional) Restart the pgcpd process for a specific border gateway function (BGF) running on an MS-PIC. This option does not restart the pgcpd process running on the Routing Engine. To restart the pgcpd process on the Routing Engine, use the **pgcp-service** option.

sflow-service—(EX Series switches only) (Optional) Restart the flow sampling (sFlow technology) process.

snmp—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

static-subscribers—(Optional) Restart the static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

statistics-service—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.

subscriber-management—(Optional) Restart the Subscriber Management process.

subscriber-management-helper—(Optional) Restart the Subscriber Management Helper process.

tunnel-oamd—(Optional) Restart the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

usb-control—(MX Series routers) (Optional) Restart the USB control process.

vrrp—(ACX Series routers, EX Series switches, and MX Series routers only) (Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

web-management—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the Web management process.

Required Privilege Level reset

Related Documentation • *Overview of Junos OS CLI Operational Mode Commands*

List of Sample Output [restart interface-control gracefully on page 261](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

restart interface-control gracefully

```
user@host> restart interface-control gracefully
Interface control process started, pid 41129
```

show policy

List of Syntax	Syntax on page 262 Syntax (EX Series Switches) on page 262
Syntax	<pre>show policy <logical-system (all <i>logical-system-name</i>)> <<i>policy-name</i>> <<i>statistics</i> ></pre>
Syntax (EX Series Switches)	<pre>show policy <<i>policy-name</i>></pre>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. statistics option introduced in Junos OS Release 16.1 for MX Series routers.
Description	Display information about configured routing policies.
Options	<p>none—List the names of all configured routing policies.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>policy-name</i>—(Optional) Show the contents of the specified policy.</p> <p>statistics—(Optional) Use in conjunction with the test policy command to show the length of time (in microseconds) required to evaluate a given policy and the number of times it has been executed. This information can be used, for example, to help structure a policy so it is evaluated efficiently. Timers shown are per route; times are not cumulative. Statistics are incremented even when the router is learning (and thus evaluating) routes from peering routers.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show policy damping• test policy on page 464
List of Sample Output	show policy on page 263 show policy policy-name on page 263 show policy statistics policy-name on page 263 show policy (Multicast Scoping) on page 264 show policy (Route Filter and source Address Filter Lists) on page 264

Output Fields Table 12 on page 263 lists the output fields for the **show policy** command. Output fields are listed in the approximate order in which they appear.

Table 12: show policy Output Fields

Field Name	Field Description
<i>policy-name</i>	Name of the policy listed.
<i>term</i>	Name of the user-defined policy term. The term name unnamed is used for policy elements that occur outside of user defined terms
<i>from</i>	Match condition for the policy.
<i>then</i>	Action for the policy.

Sample Output

show policy

```
user@host> show policy
Configured policies:
__vrf-export-red-internal__
__vrf-import-red-internal__
red-export
rf-test-policy
multicast-scoping
```

show policy policy-name

```
user@host> show policy vrf-import-red-internal
Policy vrf-import-red-internal:
  from
    203.0.113.0/28  accept
    203.0.113.32/28  accept
  then reject
```

show policy statistics policy-name

```
user@host> show policy statistics iBGP-v4-RR-Import
Policy iBGP-v4-RR-Import:
  [1243328] Term Lab-Infra:
    from [1243328 0]  proto BGP
    [28 0] route filter:
      10.11.0.0/8 orlonger
      10.13.0.0/8 orlonger
    then [28 0] accept
  [1243300] Term External:
    from [1243300 1]  proto BGP
    [1243296 0]  community Ext-Com1 [64496:1515 ]
    [1243296 0]  prefix-list-filter Customer-Routes
    [1243296 0]  aspath AS6221
    [1243296 1] route filter:
      172.16.49.0/12 orlonger
      172.16.50.0/12 orlonger
      172.16.51.0/12 orlonger
```

```
        172.16.52.0/12 orlonger
        172.16.56.0/12 orlonger
        172.16.60.0/12 orlonger
    then [1243296 2] community + Ext-Com2 [64496:2000 ] [1243296 0] accept
[4] Term Final:
    then [4 0] reject
```

show policy (Multicast Scoping)

```
user@host> show policy multicast-scoping
Policy multicast-scoping:
    from
        multicast-scope == 8
    then
        accept
```

show policy (Route Filter and source Address Filter Lists)

```
user@host> show policy rf-test-policy
Policy rf-test-policy:
    Term term1:
        from source-address-filter-list saf-list-1
        source-address filter:
            192.0.2.0/29 longer
            192.0.2.64/28 exact
            192.0.2.128/28 exact
            192.0.2.160/28 orlonger
    Term term2:
        from route-filter-list rf-list-1
        route filter:
            198.51.100.0/29 upto 198.51.100.0/30
            198.51.100.8/29 upto 198.51.100.8/30 accept
    Term unnamed:
        then reject
```

show policy conditions

Syntax	<pre>show policy conditions <condition-name> <detail> <dynamic> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show policy conditions <condition-name> <detail> <dynamic></pre>
Release Information	<p>Command introduced in Junos OS Release 9.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display all the configured conditions as well as the routing tables with which the configuration manager is interacting. If the detail keyword is included, the output also displays dependent routes for each condition.</p>
Options	<p>none—Display all configured conditions and associated routing tables.</p> <p>condition-name—(Optional) Display information about the specified condition only.</p> <p>detail—(Optional) Display the specified level of output.</p> <p>dynamic—(Optional) Display information about the conditions in the dynamic database.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show policy conditions detail on page 266
Output Fields	<p>Table 13 on page 265 lists the output fields for the show policy conditions command. Output fields are listed in the approximate order in which they appear.</p>

Table 13: show policy conditions Output Fields

Field Name	Field Description	Level of Output
Condition	Name of configured condition.	All levels
event	Condition type. If the if-route-exists option is configured, the event type is: Existence of a route in a specific routing table.	All levels
Dependent routes	List of routes dependent on the condition, along with the latest generation number.	detail

Table 13: show policy conditions Output Fields (*continued*)

Field Name	Field Description	Level of Output
Condition tables	List of routing tables associated with the condition, along with the latest generation number and number of dependencies.	All levels
If-route-exists conditions	List of conditions configured to look for a route in the specified table.	All levels

Sample Output

show policy conditions detail

```
user@host> show policy conditions detail
Configured conditions:
Condition cond1, event: Existence of a route in a specific routing table
Dependent routes:
  172.16.4.4/32, generation 3
  6.6.6.6/32, generation 3
  10.10.10.10/32, generation 3

Condition cond2, event: Existence of a route in a specific routing table
Dependent routes:
None

Condition tables:
Table inet.0, generation 4, dependencies 3, If-route-exists conditions: cond1
(static) cond2 (static)
```

show rip general-statistics

List of Syntax	Syntax on page 267 Syntax (EX Series Switches and QFX Series) on page 267
Syntax	<pre>show rip general-statistics <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches and QFX Series)	show rip general-statistics
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display brief RIP statistics.
Options	<p>none—Display brief RIP statistics.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear rip general-statistics on page 249
List of Sample Output	show rip general-statistics on page 268
Output Fields	<p>Table 14 on page 267 lists the output fields for the show rip general-statistics command. Output fields are listed in the approximate order in which they appear.</p>

Table 14: show rip general-statistics Output Fields

Field Name	Field Description
bad msgs	Number of invalid messages received.
no rcv intf	Number of packets received with no matching interface.
curr memory	Amount of memory currently used by RIP.
max memory	Most memory used by RIP.

Sample Output

show rip general-statistics

```
user@host> show rip general-statistics
RIPv2 I/O info:
  bad msgs      :      0
  no recv intf  :      0
  curr memory   :      0
  max memory    :      0
```


show rip neighbor

List of Syntax	Syntax on page 269 Syntax (EX Series Switches and QFX Series) on page 269
Syntax	<pre>show rip neighbor <instance (all <i>instance-name</i>)> <logical-system (all <i>logical-system-name</i>)> <name></pre>
Syntax (EX Series Switches and QFX Series)	<pre>show rip neighbor <instance (all <i>instance-name</i>)> <name></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display information about RIP neighbors.
Options	<p>none—Display information about all RIP neighbors for all instances.</p> <p>instance (all <i>instance-name</i>)—(Optional) Display RIP neighbor information for all instances or for only the specified routing instance.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>name—(Optional) Display detailed information about only the specified RIP neighbor.</p>
Required Privilege Level	view
List of Sample Output	show rip neighbor on page 270 show rip neighbor (With Demand Circuits Configured) on page 270
Output Fields	<p>Table 15 on page 270 lists the output fields for the show rip neighbor command. Output fields are listed in the approximate order in which they appear.</p>

Table 15: show rip neighbor Output Fields

Field Name	Field Description
Neighbor	Name of the RIP neighbor. NOTE: Beginning with Junos OS Release 11.1, when you configure demand circuits, the output displays a demand circuit (DC) flag next to neighbor interfaces configured for demand circuits. If you configure demand circuits at the [edit protocols rip group group-name neighbor neighbor-name] hierarchy level, the output shows only the neighboring interface that you specifically configured as a demand circuit. If you configure demand circuits at the [edit protocols rip group group-name] hierarchy level, all of the interfaces in the group are configured as demand circuits. Therefore, the output shows all of the interfaces in that group as demand circuits.
State	State of the connection: Up or Dn (Down).
Source Address	Address of the port on the local router.
Destination Address	Address of the port on the remote router.
Send Mode	Send options: broadcast , multicast , none , or version 1 .
Receive Mode	Type of packets to accept: both , none , version 1 , or version 2 .
In Met	Metric added to incoming routes when advertising into RIP routes that were learned from other protocols.

Sample Output

show rip neighbor

```

user@host> show rip neighbor
Neighbor      Local  Source  Destination  Send  Receive  In
-----      -
ge-2/3/0.0    Up    192.168.9.105  192.168.9.107  bcast  both      1
at-5/1/1.42    Dn    (null)      (null)        mcast  v2 only   3
at-5/1/0.42    Dn    (null)      (null)        mcast  both      3
at-5/1/0.0     Up    198.51.100.0  224.0.0.9     mcast  both      3
so-0/0/0.0     Up    192.168.9.97  224.0.0.9     mcast  both      3

```

show rip neighbor (With Demand Circuits Configured)

```

user@host> show rip neighbor
Neighbor      Local  Source  Destination  Send  Receive  In
-----      -
so-0/1/0.0(DC)  Up    10.10.10.2  224.0.0.9     mcast  both      1
so-0/2/0.0(DC)  Up    192.0.2.2   224.0.0.9     mcast  both      1

```

show rip statistics

List of Syntax	Syntax on page 271 Syntax (EX Series Switches and QFX Series) on page 271
Syntax	<pre>show rip statistics <instance (all <i>instance-name</i>)> <logical-system (all <i>logical-system-name</i>)> <name> <peer (all <i>address</i>)></pre>
Syntax (EX Series Switches and QFX Series)	<pre>show rip statistics <instance (all <i>instance-name</i>)> <name></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display RIP statistics about messages sent and received on an interface, as well as information received from advertisements from other routing devices.
Options	<p>none—Display RIP statistics for all routing instances.</p> <p>instance (all <i>instance-name</i>)—(Optional) Display RIP statistics for all instances or for only the specified routing instance.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>name</i>—(Optional) Display detailed information about only the specified RIP neighbor.</p> <p>peer (all <i>address</i>)—(Optional) Display RIP statistics for a single peer or all peers.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear rip statistics on page 250
List of Sample Output	show rip statistics on page 273
Output Fields	<p>Table 16 on page 272 lists the output fields for the show rip statistics command. Output fields are listed in the approximate order in which they appear.</p>

Table 16: show rip statistics Output Fields

Field Name	Field Description
RIP info	<p>Information about RIP on the specified interface:</p> <ul style="list-style-type: none"> • port—UDP port number used for RIP. • update interval—Interval between routing table updates, in seconds. • holddown—Hold-down interval, in seconds. • timeout—Timeout interval, in seconds. • restart in progress—Graceful restart status. Displayed when RIP is or has been in the process of graceful restart. • restart time—Estimated time for the graceful restart to finish, in seconds. • restart will complete in—Remaining time for the graceful restart to finish, in seconds. • rts learned—Number of routes learned through RIP. • rts held down—Number of routes held down by RIP. • rqsts dropped—Number of received request packets that were dropped. • resps dropped—Number of received response packets that were dropped.
<i>logical-interface</i>	<p>Name of the logical interface and its statistics:</p> <ul style="list-style-type: none"> • routes learned—Number of routes learned on the logical interface. • routes advertised—Number of routes advertised by the logical interface.
Counter	<p>List of counter types:</p> <ul style="list-style-type: none"> • Updates Sent—Number of update messages sent. • Triggered Updates Sent—Number of triggered update messages sent. • Responses Sent—Number of response messages sent. • Bad Messages—Number of invalid messages received. • RIPv1 Updates Received—Number of RIPv1 update messages received. • RIPv1 Bad Route Entries—Number of RIPv1 invalid route entry messages received. • RIPv1 Updates Ignored—Number of RIPv1 update messages ignored. • RIPv2 Updates Received—Number of RIPv2 update messages received. • RIPv2 Bad Route Entries—Number of RIPv2 invalid route entry messages received. • RIPv2 Updates Ignored—Number of RIPv2 update messages that were ignored. • Authentication Failures—Number of received update messages that failed authentication. • RIP Requests Received—Number of RIP request messages received. • RIP Requests Ignored—Number of RIP request messages ignored.
Total	Total number of packets for the selected counter.
Last 5 min	Number of packets for the selected counter in the most recent 5-minute period.
Last minute	Number of packets for the selected counter in the most recent 1-minute period.

Sample Output

show rip statistics

```

user@host> show rip statistics so-0/0/0.0
RIP info: port 520; update interval: 30s; holddown 180s; timeout 120s
restart in progress: restart time 60s; restart will complete in 55s
    rts learned   rts held down  rqsts dropped  resps dropped
              0             0             0             0
so-0/0/0.0: 0 routes learned; 501 routes advertised
Counter      Total      Last 5 min  Last minute
-----
Updates Sent          0          0          0
Triggered Updates Sent  0          0          0
Responses Sent        0          0          0
Bad Messages          0          0          0
RIPv1 Updates Received  0          0          0
RIPv1 Bad Route Entries  0          0          0
RIPv1 Updates Ignored   0          0          0
RIPv2 Updates Received  0          0          0
RIPv2 Bad Route Entries  0          0          0
RIPv2 Updates Ignored   0          0          0
Authentication Failures  0          0          0
RIP Requests Received   0          0          0
RIP Requests Ignored    0          0          0

```

show route

List of Syntax [Syntax on page 274](#)
 [Syntax \(EX Series Switches\) on page 274](#)

Syntax show route
 <all>
 <destination-prefix>
 <logical-system (all | *logical-system-name*)>
 <private>
 <te-ipv4-prefix-ip *te-ipv4-prefix-ip*>
 <te-ipv4-prefix-node-ip *te-ipv4-prefix-node-ip*>
 <te-ipv4-prefix-node-iso *te-ipv4-prefix-node-iso*>

Syntax (EX Series Switches) show route
 <all>
 <destination-prefix>
 <private>

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Option **private** introduced in Junos OS Release 9.5.
 Option **private** introduced in Junos OS Release 9.5 for EX Series switches.
 Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
 Option **display-client-data** introduced in Junos OS Release 16.2R1 on MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series routers.
 Options **te-ipv4-prefix-ip**, **te-ipv4-prefix-node-ip**, and **te-ipv4-prefix-node-iso** introduced in Junos OS Release 17.2R1 on MX Series and PTX Series.

Description Display the active entries in the routing tables.

Options **none**—Display brief information about all active entries in the routing tables.

all—(Optional) Display information about all routing tables, including private, or internal, routing tables.

destination-prefix—(Optional) Display active entries for the specified address or range of addresses.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

private—(Optional) Display information only about all private, or internal, routing tables.

display-client-data —(Optional) Display client id and cookie information for routes installed by the routing protocol process client applications.

te-ipv4-prefix-ip *te-ipv4-prefix-ip*—(Optional) Display IPv4 address of the traffic-engineering prefix, without the mask length if present in the routing table.

te-ipv4-prefix-node-ip *te-ipv4-prefix-node-ip*—(Optional) Display all prefixes that have originated from the traffic-engineering node. You can filter IPv4 node addresses from the traffic-engineered routes in the **Isdist.0** table.

te-ipv4-prefix-node-iso *te-ipv4-prefix-node-iso*—(Optional) Display all prefixes that have originated from the traffic-engineering node. You can filter IPv4 routes with the specified ISO circuit ID from the **Isdist.0** table.

Required Privilege Level

view

Related Documentation

- *Understanding IS-IS Configuration*
- *Example: Configuring IS-IS*
- *Examples: Configuring Internal BGP Peering*
- *Examples: Configuring External BGP Peering*
- *Examples: Configuring OSPF Routing Policy*
- *Verifying and Managing Junos OS Enhanced Subscriber Management*

List of Sample Output

[show route on page 278](#)
[show route \(VPN\) on page 279](#)
[show route \(with Destination Prefix\) on page 279](#)
[show route destination-prefix detail on page 279](#)
[show route extensive on page 279](#)
[show route extensive \(ECMP\) on page 280](#)
[show route extensive \(Multipath Resolution\) on page 280](#)
[show route \(Enhanced Subscriber Management\) on page 284](#)
[show route \(IPv6 Flow Specification\) on page 285](#)
[show route display-client-data detail on page 285](#)
[show route te-ipv4-prefix-ip on page 286](#)
[show route te-ipv4-prefix-ip extensive on page 286](#)
[show route te-ipv4-prefix-node-iso on page 289](#)
[show route te-ipv4-prefix-node-iso extensive on page 289](#)
[show route te-ipv4-prefix-node-iso detail on page 292](#)

Output Fields [Table 17 on page 275](#) describes the output fields for the **show route** command. Output fields are listed in the approximate order in which they appear.

Table 17: show route Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 17: show route Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). A holddown route was once the active route and is no longer the active route. The route is in the holddown state because a protocol still has interest in the route, meaning that the interest bit is set. A protocol might have its interest bit set on the previously active route because the protocol is still advertising the route. The route will be deleted after all protocols withdraw their advertisement of the route and remove their interest bit. A persistent holddown state often means that the interested protocol is not releasing its interest bit properly. <p>However, if you have configured advertisement of multiple routes (with the add-path or advertise-inactive statement), the holddown bit is most likely set because BGP is advertising the route as an active route. In this case, you can ignore the holddown state because nothing is wrong.</p> <ul style="list-style-type: none"> • hidden (routes that are not used because of a routing policy).
<i>destination-prefix</i>	<p>Route destination (for example:10.0.0.1/24). Sometimes the route information is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only. For example, 10.1.1.195:NoCtrlWord:1:1:Local/96): <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote.
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>
<i>weeks:days hours:minutes:seconds</i>	How long the route been known (for example, 2w4d 13:11:14 , or 2 weeks, 4 days, 13 hours, 11 minutes, and 14 seconds).
<i>metric</i>	Cost value of the indicated route. For routes within an AS, the cost is determined by the IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.

Table 17: show route Output Fields (*continued*)

Field Name	Field Description
localpref	Local preference value included in the route.
from	Interface from which the route was received.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
encapsulated	Extended next-hop encoding capability enabled for the specified BGP community for routing IPv4 traffic over IPv6 tunnels. When BGP receives routes without the tunnel community, IPv4-Over IPv6 tunnels are not created and BGP routes are resolved without encapsulation.
Route Labels	Stack of labels carried in the BGP route update.
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
to	<p>Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.</p> <p>If the destination is Discard, traffic is dropped.</p>

Table 17: show route Output Fields (*continued*)

Field Name	Field Description
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing. • lsp-path-name—Name of the LSP used to reach the next hop. • label-action—MPLS label and operation occurring at the next hop. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label). For VPNs, expect to see multiple push operations, corresponding to the inner and outer labels required for VPN routes (in the case of a direct PE-to-PE connection, the VPN route would have the inner label push only).
Private unicast	(Enhanced subscriber management for MX Series routers) Indicates that an access-internal route is managed by enhanced subscriber management. By contrast, access-internal routes <i>not</i> managed by enhanced subscriber management are displayed with associated next-hop and media access control (MAC) address information.
balance	Distribution of the load based on the underlying operational interface bandwidth for equal-cost multipaths (ECMP) across the nexthop gateways in percentages.

Sample Output

show route

```

user@host> show route
inet.0: 11 destinations, 12 routes (11 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:65500:1:10.0.0.20/240
    * [MVPN/70] 19:53:41, metric2 1
        Indirect
1:65500:1:10.0.0.40/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
        AS path: I
        > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
        [BGP/170] 19:53:26, localpref 100, from 10.0.0.33
        AS path: I
        > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
1:65500:1:10.0.0.60/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
        AS path: I
        > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF
        [BGP/170] 19:53:25, localpref 100, from 10.0.0.33
        AS path: I
        > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF

```

show route (VPN)

The following sample output shows a VPN route with composite next hops enabled. The first **Push** operation corresponds to the outer label. The second **Push** operation corresponds to the inner label.

```
user@host> show route 192.0.2.0

13979:665001.inet.0: 871 destinations, 3556 routes (871 active, 0 holddown, 0
hidden)
+ = Active Route, - = Last Active, * = Both

192.0.2.0/24          [BGP/170] 00:28:32, localpref 100, from 10.9.9.160
                     AS path: 13980 ?, validation-state: unverified
                     > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                     [BGP/170] 00:28:28, localpref 100, from 10.9.9.169
                     AS path: 13980 ?, validation-state: unverified
                     > to 10.100.0.42 via ae2.0, Push 126016, Push 300368(top)
                     #[Multipath/255] 00:28:28, metric2 102
                     > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                     to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
```

show route (with Destination Prefix)

```
user@host> show route 172.16.0.0/12

inet.0: 10 destinations, 10 routes (9 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.0.0/12        *[Static/5] 2w4d 12:54:27
                     > to 192.168.167.254 via fxp0.0
```

show route destination-prefix detail

```
user@host> show route 198.51.100.0 detail

inet.0: 15 destinations, 20 routes (15 active, 0 holddown, 0 hidden)
198.51.100.0/24 (2 entries, 2 announced)
  *BGP      Preference: 170/-101
  ...
  BGP-Static Preference: 4294967292
    Next hop type: Discard
    Address: 0x9041ae4
    Next-hop reference count: 2
    State: <NoReadvrt Int Ext AlwaysFlash>
  Inactive reason: Route Preference
  Local AS: 200
  Age: 4d 1:40:40
  Validation State: unverified
  Task: RT
  Announcement bits (1): 2-BGP_RT_Background
  AS path: 4 5 6 I
```

show route extensive

```
user@host> show route extensive

v1.mvpn.0: 5 destinations, 8 routes (5 active, 1 holddown, 0 hidden)
1:65500:1:10.0.0.40/240 (1 entry, 1 announced)
  *BGP      Preference: 170/-101
```

```

PMSI: Flags 0x0: Label[0:0:0]: PIM-SM: Sender 10.0.0.40 Group
203.0.113.1
  Next hop type: Indirect
  Address: 0x92455b8
  Next-hop reference count: 2
  Source: 10.0.0.30
  Protocol next hop: 10.0.0.40
  Indirect next hop: 2 no-forward
  State: <Active Int Ext>
    Local AS: 64510 Peer AS: 64511
  Age: 3 Metric2: 1
  Validation State: unverified
  Task: BGP_64510.10.0.0.30+179
  Announcement bits (2): 0-PIM.v1 1-mvpn global task
  AS path: I (Originator) Cluster list: 10.0.0.30
  AS path: Originator ID: 10.0.0.40
  Communities: target:64502:100 encapsulation:0L:14 Import
Accepted
  Localpref: 100
  Router ID: 10.0.0.30
  Primary Routing Table bgp.mvpn.0
  Indirect next hops: 1
    Protocol next hop: 10.0.0.40 Metric: 1
    Indirect next hop: 2 no-forward
    Indirect path forwarding next hops: 1
      Next hop type: Router
      Next hop: 10.0.24.4 via lt-0/3/0.24 weight 0x1
    10.0.0.40/32 Originating RIB: inet.3
      Metric: 1 Node path count: 1
      Forwarding nexthops: 1
        Nexthop: 10.0.24.4 via lt-0/3/0.24

```

show route extensive (ECMP)

```

user@host> show route extensive
*IS-IS Preference: 15
  Level: 1
  Next hop type: Router, Next hop index: 1048577
  Address: 0xFFFFFFFF
  Next-hop reference count: YY
  Next hop: 172.16.50.2 via ae1.0 balance 43%, selected
  Session Id: 0x141
  Next hop: 192.0.2.2 via ae0.0 balance 57%

```

show route extensive (Multipath Resolution)

```

user@host> show route extensive
inet.0: 37 destinations, 37 routes (36 active, 0 holddown, 1 hidden)
10.1.1.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.1.1.2/32 -> {indirect(1048574)}
*Static Preference: 5
  Next hop type: Indirect, Next hop index: 0
  Address: 0xb39d1b0
  Next-hop reference count: 2
  Next hop type: Router, Next hop index: 581
  Next hop: 12.1.1.2 via ge-2/0/1.0, selected
  Session Id: 0x144
  Next hop: 13.1.1.2 via ge-2/0/2.0, selected
  Session Id: 0x145

```

```

Protocol next hop: 10.1.1.1
Indirect next hop: 0xb2b20f0 1048574 INH Session ID: 0x143
State: <Active Int Ext>
Age: 2:53 Metric2: 0
Validation State: unverified
Task: RT
Announcement bits (2): 0-KRT 2-Resolve tree 1
AS path: I
Indirect next hops: 1
    Protocol next hop: 10.1.1.1
    Indirect next hop: 0xb2b20f0 1048574 INH Session ID: 0x143

    Indirect path forwarding next hops: 2
        Next hop type: Router
        Next hop: 12.1.1.2 via ge-2/0/1.0
        Session Id: 0x144
        Next hop: 13.1.1.2 via ge-2/0/2.0
        Session Id: 0x145
10.1.1.1/32 Originating RIB: inet.0
    Node path count: 1
    Node flags: 1
    Forwarding nexthops: 2 (Merged)
    Nexthop: 12.1.1.2 via ge-2/0/1.0
    Nexthop: 13.1.1.2 via ge-2/0/2.0

user@host> show route active-path extensive
user@host> show route 141.1.1.1 active-path extensive

inet.0: 1000061 destinations, 1000082 routes (1000061 active, 0 holddown, 0 hidden)
141.1.1.1/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 141.1.1.1/32 -> {indirect(1051215)}
unicast reverse-path: 0
[ae0.0 ae1.0]
Page 0 idx 0, (group Internet-IPv4 type External) Type 1 val 0xbb2e53d8 (adv_entry)
Advertised metrics:
Nexthop: Self
AS path: [500] 410 I
Communities:
Path 141.1.1.1 from 50.0.0.11 Vector len 4. Val: 0
*BGP Preference: 170/-101
Next hop type: Indirect, Next hop index: 0
Address: 0x2e9aacdc
Next-hop reference count: 500000
Source: 50.0.0.11
Next hop type: Router, Next hop index: 0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 25, Push 20(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 20: None;
Label element ptr: 0xb5dc1780
Label parent element ptr: 0x18d48080
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 25, Push 22(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 22: None;
Label element ptr: 0xb5dc1700
Label parent element ptr: 0x18d41000

```

Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 24, Push 48(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 48: None;
Label element ptr: 0x18d40800
Label parent element ptr: 0x18d49780
Label element references: 3
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 24, Push 49(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 49: None;
Label element ptr: 0xb5dc1680
Label parent element ptr: 0x18d48f00
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 25, Push 21(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 21: None;
Label element ptr: 0xb5dc1600
Label parent element ptr: 0x18d44d80
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 25, Push 25(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 25: None;
Label element ptr: 0xb5dc1580
Label parent element ptr: 0x18d3da80
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1, selected
Label operation: Push 3851, Push 24, Push 68(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 68: None;
Label element ptr: 0x18d41500
Label parent element ptr: 0x18d49000
Label element references: 3
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 24, Push 69(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 69: None;
Label element ptr: 0xb5dc1500
Label parent element ptr: 0x18d48300
Label element references: 2

```

Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Protocol next hop: 50.0.0.11
Label operation: Push 3851
Label TTL action: prop-ttl
Load balance label: Label 3851: None;
Indirect next hop: 0x1883e200 1051215 INH Session ID: 0xb0d
State:
Local AS: 500 Peer AS: 500
Age: 1:40:03 Metric2: 2
Validation State: unverified
Task: BGP_500.50.0.0.11
Announcement bits (5): 0-KRT 8-KRT 9-BGP_RT_Background 10-Resolve tree 5 11-Resolve
tree 8
AS path: 410 I
Accepted
Route Label: 3851
Localpref: 100
Router ID: 50.0.0.11
Indirect next hops: 1
Protocol next hop: 50.0.0.11 Metric: 2
Label operation: Push 3851
Label TTL action: prop-ttl
Load balance label: Label 3851: None;
Indirect next hop: 0x1883e200 1051215 INH Session ID: 0xb0d
Indirect path forwarding next hops (Merged): 8
Next hop type: Router
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
50.0.0.11/32 Originating RIB: inet.3
Metric: 1 Node path count: 4
Node flags: 1
Indirect nexthops: 4
Protocol Nexthop: 50.0.0.4 Metric: 1 Push 24
Indirect nexthop: 0x1880f200 1048597 INH Session ID: 0xb0c
Path forwarding nexthops link: 0x36120400
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.4/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0

```

```
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.5 Metric: 1 Push 24
Indirect nexthop: 0x18810000 1048596 INH Session ID: 0xb0b
Path forwarding nexthops link: 0x1545be00
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.5/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.6 Metric: 1 Push 25
Indirect nexthop: 0x1880e600 1048588 INH Session ID: 0xb0a
Path forwarding nexthops link: 0x3611f440
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.6/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.7 Metric: 1 Push 25
Indirect nexthop: 0x1880dc00 1048586 INH Session ID: 0xb09
Path forwarding nexthops link: 0x15466d80
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.7/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
```

show route (Enhanced Subscriber Management)

```
user@host> show route
inet.0: 41 destinations, 41 routes (40 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

198.51.100.11/24    *[Access-internal/12] 00:00:08
> to #0 10.0.0.1.93.65 via demux0.1073741824
```



```
198.51.100.12/24    *[Access-internal/12] 00:00:08
                  Private unicast
```

show route (IPv6 Flow Specification)

```
user@host> show route
inet6.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::10:255:185:19/128
    *[Direct/0] 05:11:27
    > via lo0.0
2001:db8::11:11:11:0/120
    *[BGP/170] 00:28:58, localpref 100
    AS path: 2000 I, validation-state: unverified
    > to 2001:db8::13:14:2:2 via ge-1/1/4.0
2001:db8::13:14:2:0/120*[Direct/0] 00:45:07
    > via ge-1/1/4.0
2001:db8::13:14:2:1/128*[Local/0] 00:45:18
    Local via ge-1/1/4.0
fe80::2a0:a50f:fc71:71d5/128
    *[Direct/0] 05:11:27
    > via lo0.0
fe80::5e5e:abff:feb0:933e/128
    *[Local/0] 00:45:18
    Local via ge-1/1/4.0

inet6flow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::11:11:11:10/128,* ,proto=6,dstport=80,srcport=65535/term:1
    *[BGP/170] 00:28:58, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious
2001:db8::11:11:11:30/128,* ,icmp6-type=128,len=100,dscp=10/term:2
    *[BGP/170] 00:20:54, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious
```

show route display-client-data detail

```
user@host> show route 198.51.100.0/24 display-client-data detail
inet.0: 59 destinations, 70 routes (59 active, 0 holddown, 0 hidden)
198.51.100.0/24 (1 entry, 1 announced)
    State: <FlashAll>
    *BGP-Static Preference: 5/-101
    Next hop type: Indirect, Next hop index: 0
    Address: 0xa5c2af8
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 1641
    Next hop: 192.0.2.1 via ge-2/1/1.0, selected
    Session Id: 0x160
    Protocol next hop: 192.0.2.1
    Indirect next hop: 0xa732cb0 1048621 INH Session ID: 0x17e
    State: <Active Int Ext AlwaysFlash NSR-incapable Programmed>
    Age: 3:13      Metric2: 0
    Validation State: unverified
    Announcement bits (3): 0-KRT 5-LDP 6-Resolve tree 3
```

```
AS path: I
Client id: 1, Cookie: 1
```

show route te-ipv4-prefix-ip

```
user@host> show route te-ipv4-prefix-ip 10.10.10.10
lsdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152
      *[IS-IS/15] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0101.0101.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0202.0202.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0303.0303.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0404.0404.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0505.0505.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0606.0606.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0707.0707.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
```

show route te-ipv4-prefix-ip extensive

```
user@host> show route te-ipv4-prefix-ip 10.10.10.10 extensive
lsdist.0: 298 destinations, 298 routes (298 active, 0 holddown, 0 hidden)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
    State:<Active NotInstall>
    Local AS: 100
    Age: 7:58
```

```

Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0101.0101.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
  State: <Active NotInstall>
  Local AS: 100
    Age: 7:58
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0xe0, Algo: 0>

PREFIX { Node { AS:100 ISO:0100.0202.0202.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
  State: <Active NotInstall>
  Local AS: 100
    Age: 7:58
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0303.0303.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
  State: <Active NotInstall>
  Local AS: 100
    Age: 7:58
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0404.0404.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:

```

```
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0505.0505.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 298
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0606.0606.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 298
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0707.0707.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 298
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
```

```

Address: 0xa1a2ac4
Next-hop reference count: 298
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0x40, Algo: 0

```

show route te-ipv4-prefix-node-iso

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00
Isdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152
      *[IS-IS/15] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious

```

show route te-ipv4-prefix-node-iso extensive

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00 extensive
Isdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0

```

```
} /1152 (1 entry, 0 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
} /1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1001, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
} /1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1002, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
} /1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
```

```

Prefix SID: 1003, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1004, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1005, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1006, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47

```

```

Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1007, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

```

show route te-ipv4-prefix-node-iso detail

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00 detail
Isdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1001, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18

```



```

Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1002, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1003, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1004, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1005, Flags: 0xe0, Algo: 0

```

```
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1006, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1007, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0
```

show route active-path

List of Syntax	Syntax on page 295 Syntax (EX Series Switches) on page 295
Syntax	<pre>show route active-path <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches)	<pre>show route active-path <brief detail extensive terse></pre>
Release Information	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	Display all active routes for destinations. An active route is a route that is selected as the best path. Inactive routes are not displayed.
Options	<p>none—Display all active routes.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route active-path on page 295 show route active-path brief on page 296 show route active-path detail on page 296 show route active-path extensive on page 297 show route active-path terse on page 299
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route active-path

```
user@host> show route active-path

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.70.19/32    *[Direct/0] 21:33:52
```

```

> via lo0.0
10.255.71.50/32 * [IS-IS/15] 00:18:13, metric 10
> to 172.16.100.1 via so-2/1/3.0
172.16.100.1/24 * [Direct/0] 00:18:36
> via so-2/1/3.0
172.16.100.1/32 * [Local/0] 00:18:41
Local via so-2/1/3.0
192.168.64.0/21 * [Direct/0] 21:33:52
> via fxp0.0
192.168.70.19/32 * [Local/0] 21:33:52
Local via fxp0.0

```

show route active-path brief

The output for the **show route active-path brief** command is identical to that for the **show route active-path** command. For sample output, see [show route active-path on page 295](#).

show route active-path detail

```

user@host> show route active-path detail

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)

10.255.70.19/32 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

10.255.71.50/32 (1 entry, 1 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Router, Next hop index: 397
    Next-hop reference count: 4
    Next hop: 172.16.100.1 via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:31 Metric: 10
    Task: IS-IS
    Announcement bits (4): 0-KRT 2-IS-IS 5-Resolve tree 2 6-Resolve
tree 3
    AS path: I

172.16.100.0/24 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:54
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3

```

```

AS path: I

172.16.100.1/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: so-2/1/3.0
    State: <Active NoReadvrt Int>
    Local AS: 200
    Age: 21:59
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.64.0/21 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via fxp0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.70.19/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: fxp0.0
    State: <Active NoReadvrt Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

```

show route active-path extensive

```

user@host> show route active-path extensive

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
10.255.70.19/32 (1 entry, 1 announced)
TSI:
IS-IS level 1, LSP fragment 0
IS-IS level 2, LSP fragment 0
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:39:47
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3

AS path: I

10.255.71.50/32 (1 entry, 1 announced)

```

```
TSI:
KRT in-kernel 10.255.71.50/32 -> {172.16.100.1}
IS-IS level 2, LSP fragment 0
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Router, Next hop index: 397
    Next-hop reference count: 4
    Next hop: 172.16.100.1 via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 24:08 Metric: 10
    Task: IS-IS
    Announcement bits (4): 0-KRT 2-IS-IS 5-Resolve tree 2 6-Resolve
tree 3
    AS path: I

172.16.100.1/24 (1 entry, 1 announced)
TSI:
IS-IS level 1, LSP fragment 0
IS-IS level 2, LSP fragment 0
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 24:31
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

172.16.100.1/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: so-2/1/3.0
    State: <Active NoReadvrt Int>
    Local AS: 200
    Age: 24:36
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.64.0/21 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via fxp0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:39:47
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.70.19/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: fxp0.0
```

```

State: <Active NoReadvrt Int>
Local AS: 200
Age: 21:39:47
Task: IF
Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
AS path: I

```

show route active-path terse

```
user@host> show route active-path terse
```

```
inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
```

```
+ = Active Route, - = Last Active, * = Both
```

A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	10.255.70.19/32	D	0			>lo0.0	
*	10.255.71.50/32	I	15	10		>172.16.100.1.	
*	172.16.100.0/24	D	0			>so-2/1/3.0	
*	172.16.100.2/32	L	0			Local	
*	192.168.64.0/21	D	0			>fxp0.0	
*	192.168.70.19/32	L	0			Local	

show route advertising-protocol

Syntax	<code>show route advertising-protocol <i>protocol neighbor-address</i></code> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display the routing information as it has been prepared for advertisement to a particular neighbor of a particular dynamic routing protocol.
Options	<p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>neighbor-address</i>—Address of the neighboring router to which the route entry is being transmitted.</p> <p><i>protocol</i>—Protocol transmitting the route:</p> <ul style="list-style-type: none">• bgp—Border Gateway Protocol• dvmrp—Distance Vector Multicast Routing Protocol• msdp—Multicast Source Discovery Protocol• pim—Protocol Independent Multicast• rip—Routing Information Protocol• ripng—Routing Information Protocol next generation
Additional Information	Routes displayed are routes that the routing table has exported into the routing protocol and that have been filtered by the associated protocol's export routing policy statements. Starting with Junos OS Release 13.3, you can display the routing instance table foo for any address family, on a VPN route reflector, or a VPN AS boundary router that is advertising local VPN routes. However, If you do not specify the table in the command, the output displays each VRF prefix twice.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring the MED Attribute That Determines the Exit Point in an AS</i>
List of Sample Output	show route advertising-protocol bgp (Layer 3 VPN) on page 303 show route advertising-protocol bgp detail on page 303

[show route advertising-protocol bgp detail \(Aggregate Extended Community Bandwidth\) on page 303](#)
[show route advertising-protocol bgp detail \(Labeled Unicast\) on page 304](#)
[show route advertising-protocol bgp detail \(Layer 2 VPN\) on page 304](#)
[show route advertising-protocol bgp detail \(Layer 3 VPN\) on page 304](#)
[show route advertising-protocol bgp extensive all \(Next Hop Self with RIB-out IP Address\) on page 305](#)

Output Fields Table 18 on page 301 lists the output fields for the **show route advertising-protocol** command. Output fields are listed in the approximate order in which they appear.

Table 18: show route advertising-protocol Output Fields

Field Name	Field Description	Level of Output
<i>routing-table-name</i>	Name of the routing table—for example, inet.0.	All levels
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.	All levels
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy) 	All levels
Prefix	Destination prefix.	brief none
<i>destination-prefix (entry, announced)</i>	Destination prefix. The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination.	detail extensive
BGP group and type	BGP group name and type (Internal or External).	detail extensive
Route Distinguisher	Unique 64-bit prefix augmenting each IP subnet.	detail extensive
Advertised Label	Incoming label advertised by the Label Distribution Protocol (LDP). When an IP packet enters a label-switched path (LSP), the ingress router examines the packet and assigns it a label based on its destination, placing the label in the packet's header. The label transforms the packet from one that is forwarded based on its IP routing information to one that is forwarded based on information associated with the label.	detail extensive
Label-Base, range	First label in a block of labels and label block size. A remote PE router uses this first label when sending traffic toward the advertising PE router.	detail extensive
VPN Label	Virtual private network (VPN) label. Packets are sent between CE and PE routers by advertising VPN labels. VPN labels transit over either a Resource Reservation Protocol (RSVP) or a Label Distribution Protocol (LDP) label-switched path (LSP) tunnel.	detail extensive

Table 18: show route advertising-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Nexthop	<p>Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.</p> <p>If the next-hop advertisement to the peer is Self, and the RIB-out next hop is a specific IP address, the RIB-out IP address is included in the extensive output. See show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address) on page 305.</p>	All levels
MED	Multiple exit discriminator value included in the route.	brief
Lclpref or Localpref	Local preference value included in the route.	All levels
Queued	When BGP route prioritization is enabled and a route is present in a priority queue, this shows which priority queue the route is in.	All levels except brief
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if configured on the router, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>	All levels
Route Labels	Stack of labels carried in the BGP route update.	detail extensive
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.	detail extensive
Originator ID	(For route reflected output only) Address of routing device that originally sent the route to the route reflector.	detail extensive
Communities	Community path attribute for the route. See the output field table for the show route detail command for all possible values for this field.	detail extensive
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.	detail extensive

Table 18: show route advertising-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Attrset AS	Number, local preference, and path of the autonomous system (AS) that originated the route. These values are stored in the Attrset attribute at the originating router.	detail extensive
Layer2-info:encaps	Layer 2 encapsulation (for example, VPLS).	detail extensive
control flags	Control flags: none or Site Down .	detail extensive
mtu	Maximum transmission unit (MTU) of the Layer 2 circuit.	detail extensive

Sample Output

show route advertising-protocol bgp (Layer 3 VPN)

```

user@host> show route advertising-protocol bgp 10.255.14.171
VPN-A.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.172/32 Self              1      100 I
VPN-B.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.181/32 Self              2      100 I

```

show route advertising-protocol bgp detail

```

user@host> show route advertising-protocol bgp 111.222.1.3 detail
bgp20.inet.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
111.222.1.11/32 (1 entry, 1 announced)
  BGP group pe-pe type Internal
    Route Distinguisher: 111.255.14.11:69
    Advertised Label: 100000
    next hop: Self
    Localpref: 100
    AS path: 2 I
    Communities: target:69:20
    AIGP 210
111.8.0.0/16 (1 entry, 1 announced)
  BGP group pe-pe type Internal
    Route Distinguisher: 111.255.14.11:69
    Advertised Label: 100000
    Next hop: Self
    Localpref: 100
    AS path: 2 I
    Communities: target:69:20
    AIGP 210

```

show route advertising-protocol bgp detail (Aggregate Extended Community Bandwidth)

```

user@host> show route advertising-protocol bgp 10.0.4.2 10.0.2.0/30 detail
inet.0: 20 destinations, 26 routes (20 active, 0 holddown, 0 hidden)
* 10.0.2.0/30 (2 entries, 1 announced)
  BGP group external2 type External
    Nexthop: Self

```

```
AS path: [65000] 65001 I
Communities: bandwidth:65000:80000000
```

show route advertising-protocol bgp detail (Labeled Unicast)

```
user@host>show route advertising bgp 1.1.1.3 detail
inet.0: 69 destinations, 70 routes (69 active, 0 holddown, 0 hidden)
* 1.1.1.8/32 (2 entries, 2 announced)
BGP group ibgp type Internal
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: 1.1.1.4
MED: 7
Localpref: 100
AS path: [5] I
Cluster ID: 3.3.3.3
Originator ID: 1.1.1.1
Entropy label capable
inet6.0: 26 destinations, 28 routes (26 active, 0 holddown, 0 hidden)
* 100::1/128 (2 entries, 1 announced)
BGP group ibgp type Internal
Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: [5] I
Cluster ID: 3.3.3.3
Originator ID: 1.1.1.1
```

show route advertising-protocol bgp detail (Layer 2 VPN)

```
user@host> show route advertising-protocol bgp 192.168.24.1 detail
vpn-a.l2vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
192.168.16.1:1:1:1/96 (1 entry, 1 announced)
BGP group int type Internal
Route Distinguisher: 192.168.16.1:1
Label-base : 32768, range : 3
Nexthop: Self
Localpref: 100
AS path: I
Communities: target:65412:100
AIGP 210
Layer2-info: encaps:VLAN, control flags:, mtu:
```

show route advertising-protocol bgp detail (Layer 3 VPN)

```
user@host> show route advertising-protocol bgp 10.255.14.176 detail
vpna.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
* 10.49.0.0/30 (1 entry, 1 announced)
BGP group ibgp type Internal
Route Distinguisher: 10.255.14.174:2
VPN Label: 101264
Nexthop: Self
Localpref: 100
AS path: I
Communities: target:200:100
AIGP 210
AttrSet AS: 100
Localpref: 100
AS path: I
...
```

show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address)

```
user@host> show route advertising-protocol bgp 200.0.0.2 170.0.1.0/24 extensive all
inet.0: 13 destinations, 19 routes (13 active, 0 holddown, 6 hidden)
  170.0.1.0/24 (2 entries, 1 announced)
    BGP group eBGP-INTEROP type External
      Nexthop: Self (rib-out 10.100.3.2)
      AS path: [4713] 200 I
  ...
```

show route all

List of Syntax	Syntax on page 306 Syntax (EX Series Switches) on page 306
Syntax	<code>show route all</code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route all</code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display information about all routes in all routing tables, including private, or internal, tables.
Options	none —Display information about all routes in all routing tables, including private, or internal, tables. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show route brief on page 311• show route detail on page 313
List of Sample Output	show route all on page 306
Output Fields	In Junos OS Release 9.5 and later, only the output fields for the show route all command display all routing tables, including private, or hidden, routing tables. The output field table of the show route command does not display entries for private, or hidden, routing tables in Junos OS Release 9.5 and later.

Sample Output

show route all

The following example displays a snippet of output from the **show route** command and then displays the same snippet of output from the **show route all** command:

```
user@host> show route
mpls.0: 7 destinations, 7 routes (5 active, 0 holddown, 2 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
0                *[MPLS/0] 2d 02:24:39, metric 1
```

```

        Receive
1      *[MPLS/0] 2d 02:24:39, metric 1
        Receive
2      *[MPLS/0] 2d 02:24:39, metric 1
        Receive
800017 *[VPLS/7] 1d 14:00:16
        > via vt-3/2/0.32769, Pop
800018 *[VPLS/7] 1d 14:00:26
        > via vt-3/2/0.32772, Pop

user@host> show route all
mpls.0: 7 destinations, 7 routes (5 active, 0 holddown, 2 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
0      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
1      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
2      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
800017 *[VPLS/7] 1d 13:54:49
        > via vt-3/2/0.32769, Pop
800018 *[VPLS/7] 1d 13:54:59
        > via vt-3/2/0.32772, Pop
vt-3/2/0.32769 [VPLS/7] 1d 13:54:49
                Unusable
vt-3/2/0.32772 [VPLS/7] 1d 13:54:59
                Unusable

```

show route best

List of Syntax	Syntax on page 308 Syntax (EX Series Switches) on page 308
Syntax	<code>show route best <i>destination-prefix</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route best <i>destination-prefix</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the route in the routing table that is the best route to the specified address or range of addresses. The best route is the longest matching route.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . <i>destination-prefix</i> —Address or range of addresses. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show route brief on page 311• show route detail on page 313
List of Sample Output	show route best on page 308 show route best detail on page 309 show route best extensive on page 310 show route best terse on page 310
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route best

```
user@host> show route best 10.255.70.103
```



```

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.255.70.103/32  * [OSPF/10] 1d 13:19:20, metric 2
                  > to 10.31.1.6 via ge-3/1/0.0
                  via so-0/3/0.0

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.255.70.103/32  * [RSVP/7] 1d 13:20:13, metric 2
                  > via so-0/3/0.0, label-switched-path green-r1-r3

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.0.0.0/8        * [Direct/0] 2d 01:43:34
                  > via fxp2.0
                  [Direct/0] 2d 01:43:34
                  > via fxp1.0

```

show route best detail

```

user@host> show route best 10.255.70.103 detail
inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
10.255.70.103/32 (1 entry, 1 announced)
    *OSPF  Preference: 10
        Next-hop reference count: 9
        Next hop: 10.31.1.6 via ge-3/1/0.0, selected
        Next hop: via so-0/3/0.0
        State: <Active Int>
        Local AS: 69
        Age: 1d 13:20:06      Metric: 2
        Area: 0.0.0.0
        Task: OSPF
        Announcement bits (2): 0-KRT 3-Resolve tree 2
        AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
10.255.70.103/32 (1 entry, 1 announced)
    State: <FlashAll>
    *RSVP  Preference: 7
        Next-hop reference count: 5
        Next hop: via so-0/3/0.0 weight 0x1, selected
        Label-switched-path green-r1-r3
        Label operation: Push 100016
        State: <Active Int>
        Local AS: 69
        Age: 1d 13:20:59      Metric: 2
        Task: RSVP
        Announcement bits (1): 1-Resolve tree 2
        AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
10.0.0.0/8 (2 entries, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via fxp2.0, selected
        State: <Active Int>

```

```

Age: 2d 1:44:20
Task: IF
AS path: I
Direct Preference: 0
Next hop type: Interface
Next-hop reference count: 1
Next hop: via fxp1.0, selected
State: <NotBest Int>
Inactive reason: No difference
Age: 2d 1:44:20
Task: IF
AS path: I

```

show route best extensive

The output for the **show route best extensive** command is identical to that for the **show route best detail** command. For sample output, see [show route best detail on page 309](#).

show route best terse

```

user@host> show route best 10.255.70.103 terse
inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.255.70.103/32  0  10           2           >10.31.1.6
                               so-0/3/0.0

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.255.70.103/32  R   7           2           >so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.0.0.0/8        D   0           0           >fxp2.0
                    D   0           0           >fxp1.0

```

show route brief

List of Syntax	Syntax on page 311 Syntax (EX Series Switches) on page 311
Syntax	show route brief <i><destination-prefix></i> <i><logical-system (all logical-system-name)></i>
Syntax (EX Series Switches)	show route brief <i><destination-prefix></i>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display brief information about the active entries in the routing tables.
Options	none —Display all active entries in the routing table. <i>destination-prefix</i> —(Optional) Display active entries for the specified address or range of addresses. <i>logical-system (all logical-system-name)</i> —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show route all on page 306 • show route best on page 308
List of Sample Output	show route brief on page 311
Output Fields	For information about output fields, see the Output Field table of the show route command.

Sample Output

show route brief

```

user@host> show route brief
inet.0: 10 destinations, 10 routes (9 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

0.0.0.0/0          *[Static/5] 1w5d 20:30:29
                   Discard
10.255.245.51/32  *[Direct/0] 2w4d 13:11:14
                   > via 10.0.0

```

```
172.16.0.0/12      *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.0.0/18     *[Static/5] 1w5d 20:30:29
                  > to 192.168.167.254 via fxp0.0
192.168.40.0/22    *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.64.0/18    *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.164.0/22   *[Direct/0] 2w4d 13:11:14
                  > via fxp0.0
192.168.164.51/32  *[Local/0] 2w4d 13:11:14
                  Local via fxp0.0
207.17.136.192/32 *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
green.inet.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
100.101.0.0/16     *[Direct/0] 1w5d 20:30:28
                  > via fe-0/0/3.0
100.101.2.3/32     *[Local/0] 1w5d 20:30:28
                  Local via fe-0/0/3.0
172.16.233.5/32    *[OSPF/10] 1w5d 20:30:29, metric 1
                  MultiRecv
```

show route detail

List of Syntax	Syntax on page 313 Syntax (EX Series Switches) on page 313
Syntax	show route detail <destination-prefix> <logical-system (all logical-system-name)>
Syntax (EX Series Switches)	show route detail <destination-prefix>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display detailed information about the active entries in the routing tables.
Options	none —Display all active entries in the routing table on all systems. destination-prefix —(Optional) Display active entries for the specified address or range of addresses. logical-system (all logical-system-name) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
List of Sample Output	show route detail on page 324 show route detail (with BGP Multipath) on page 330 show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 331 show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 331
Output Fields	Table 19 on page 313 describes the output fields for the show route detail command. Output fields are listed in the approximate order in which they appear.

Table 19: show route detail Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route-destination</i> (entry, announced)	<p>Route destination (for example:10.0.0.1/24). The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote. • source—Source of the advertisement: Local or Remote.
<i>label stacking</i>	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of 2 or more exits this routing device with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
[protocol, preference]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value.</p> <p>Preference2 values are signed integers, that is, Preference2 values can be either positive or negative values. However, Junos OS evaluates Preference2 values as unsigned integers that are represented by positive values. Based on the Preference2 values, Junos OS evaluates a preferred route differently in the following scenarios:</p> <ul style="list-style-type: none"> • Both Signed Preference2 values <ul style="list-style-type: none"> • Route A = -101 • Route B = -156 <p>Where both the Preference2 values are signed, Junos OS evaluates only the unsigned value of Preference2 and Route A, which has a lower Preference2 value is preferred.</p> • Unsigned Preference2 values <p>Now consider both unsigned Preference2 values:</p> <ul style="list-style-type: none"> • Route A = 4294967096 • Route B = 200 <p>Here, Junos OS considers the lesser Preference2 value and Route B with a Preference2 value of 200 is preferred because it is less than 4294967096.</p> • Combination of signed and unsigned Preference2 values <p>When Preference2 values of two routes are compared, and for one route the Preference2 is a signed value, and for the other route it is an unsigned value, Junos OS prefers the route with the positive Preference2 value over the negative Preference2 value. For example, consider the following signed and unsigned Preference2 values:</p> <ul style="list-style-type: none"> • Route A = -200 • Route B = 200 <p>In this case, Route B with a Preference2 value of 200 is preferred although this value is greater than -200, because Junos OS evaluates only the unsigned value of the Preference2 value.</p>
Level	(IS-IS only). In IS-IS, a single AS can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
Next-hop type	Type of next hop. For a description of possible values for this field, see Table 20 on page 319 .
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path lsp-path-name	Name of the LSP used to reach the next hop.
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to derive a forwarding next hop.
Indirect next hop	Index designation used to specify the mapping between protocol next hops, tags, kernel export policy, and the forwarding next hops.
State	State of the route (a route can be in more than one state). See Table 21 on page 321 .
Local AS	AS number of the local routing device.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances. For sample output, see show route table .
Task	Name of the protocol that has added the route.
Announcement bits	The number of BGP peers or protocols to which Junos OS has announced this route, followed by the list of the recipients of the announcement. Junos OS can also announce the route to the KRT for installing the route into the Packet Forwarding Engine, to a resolve tree, a L2 VC, or even a VPN. For example, <i>n-Resolve inet</i> indicates that the specified route is used for route resolution for next hops found in the routing table. <ul style="list-style-type: none"> <i>n</i>—An index used by Juniper Networks customer support only.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> I—IGP. E—EGP. Recorded—The AS path is recorded by the sample process (sampled). ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used in the AS-path merge process, as defined in RFC 4893. []—If more than one AS number is configured on the routing device, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. ()—Parentheses enclose a confederation. ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGP peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
ORR Generation-ID	Displays the optimal route reflection (ORR) generation identifier. ISIS and OSPF interior gateway protocol (IGP) updates filed whenever any of the corresponding ORR route has its metric valued changed, or if the ORR route is added or deleted.
FECs bound to route	Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Prefixes bound to route	Forwarding equivalent class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See Table 22 on page 323 for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down .
mtu	Maximum transmission unit (MTU) information.

Table 19: show route detail Output Fields (*continued*)

Field Name	Field Description
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Accepted Multipath	Current active path when BGP multipath is configured.
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.
Accepted LongLivedStaleImport	<p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.</p> <p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table</p>
ImportAccepted LongLivedStaleImport	<p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table</p> <p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.</p>
Accepted MultipathContrib	Path currently contributing to BGP multipath.
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.

Table 20 on page 319 describes all possible values for the Next-hop Types output field.

Table 20: Next-hop Types Output Field Values

Next-Hop Type	Description
Broadcast (bcast)	Broadcast next hop.
Deny	Deny next hop.
Discard	Discard next hop.
Dynamic List	Dynamic list next hop

Table 20: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Flood	Flood next hop. Consists of components called branches, up to a maximum of 32 branches. Each flood next-hop branch sends a copy of the traffic to the forwarding interface. Used by point-to-multipoint RSVP, point-to-multipoint LDP, point-to-multipoint CCC, and multicast.
Hold	Next hop is waiting to be resolved into a unicast or multicast type.
Indexed (idxd)	Indexed next hop.
Indirect (indr)	Used with applications that have a protocol next hop address that is remote. You are likely to see this next-hop type for internal BGP (IBGP) routes when the BGP next hop is a BGP neighbor that is not directly connected.
Interface	Used for a network address assigned to an interface. Unlike the router next hop, the interface next hop does not reference any specific node on the network.
Local (locl)	Local address on an interface. This next-hop type causes packets with this destination address to be received locally.
Multicast (mcst)	Wire multicast next hop (limited to the LAN).
Multicast discard (mdsc)	Multicast discard.
Multicast group (mgrp)	Multicast group member.
Receive (recv)	Receive.
Reject (rjct)	Discard. An ICMP unreachable message was sent.
Resolve (rslv)	Resolving next hop.
Routed multicast (mcrt)	Regular multicast next hop.
Router	<p>A specific node or set of nodes to which the routing device forwards packets that match the route prefix.</p> <p>To qualify as next-hop type router, the route must meet the following criteria:</p> <ul style="list-style-type: none"> • Must not be a direct or local subnet for the routing device. • Must have a next hop that is directly connected to the routing device.
Table	Routing table next hop.

Table 20: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Unicast (ucst)	Unicast.
Unilist (ulst)	List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.

Table 21 on page 321 describes all possible values for the State output field. A route can be in more than one state (for example, **<Active NoReadvrt Int Ext>**).

Table 21: State Output Field Values

Value	Description
Accounting	Route needs accounting.
Active	Route is active.
Always Compare MED	Path with a lower multiple exit discriminator (MED) is available.
AS path	Shorter AS path is available.
Cisco Non-deterministic MED selection	Cisco nondeterministic MED is enabled, and a path with a lower MED is available.
Clone	Route is a clone.
Cluster list length	Length of cluster list sent by the route reflector.
Delete	Route has been deleted.
Ex	Exterior route.
Ext	BGP route received from an external BGP neighbor.
FlashAll	Forces all protocols to be notified of a change to any route, active or inactive, for a prefix. When not set, protocols are informed of a prefix only when the active route changes.
Hidden	Route not used because of routing policy.
IfCheck	Route needs forwarding RPF check.
IGP metric	Path through next hop with lower IGP metric is available.
Inactive reason	Flags for this route, which was not selected as best for a particular destination.
Initial	Route being added.

Table 21: State Output Field Values (*continued*)

Value	Description
Int	Interior route.
Int Ext	BGP route received from an internal BGP peer or a BGP confederation peer.
Interior > Exterior > Exterior via Interior	Direct, static, IGP, or EBGp path is available.
Local Preference	Path with a higher local preference value is available.
Martian	Route is a martian (ignored because it is obviously invalid).
MartianOK	Route exempt from martian filtering.
Next hop address	Path with lower metric next hop is available.
No difference	Path from neighbor with lower IP address is available.
NoReadvrt	Route not to be advertised.
NotBest	Route not chosen because it does not have the lowest MED.
Not Best in its group	Incoming BGP AS is not the best of a group (only one AS can be the best).
NotInstall	Route not to be installed in the forwarding table.
Number of gateways	Path with a greater number of next hops is available.
Origin	Path with a lower origin code is available.
Pending	Route pending because of a hold-down configured on another route.
Programmed	Route installed programmatically by on-box or off-box applications using API.
Release	Route scheduled for release.
RIB preference	Route from a higher-numbered routing table is available.
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.
Route Metric or MED comparison	Route with a lower metric or MED is available.
Route Preference	Route with lower preference value is available
Router ID	Path through a neighbor with lower ID is available.

Table 21: State Output Field Values (*continued*)

Value	Description
Secondary	Route not a primary route.
Unusable path	Path is not usable because of one of the following conditions: <ul style="list-style-type: none"> The route is damped. The route is rejected by an import policy. The route is unresolved.
Update source	Last tiebreaker is the lowest IP address value.
ProtectionCand	Indicates paths requesting protection.
ProtectionPath	Indicates the route entry that can be used as a protection path.

Table 22 on page 323 describes the possible values for the Communities output field.

Table 22: Communities Output Field Values

Value	Description
<i>area-number</i>	4 bytes, encoding a 32-bit area number. For AS-external routes, the value is 0 . A nonzero value identifies the route as internal to the OSPF domain, and as within the identified area. Area numbers are relative to a particular OSPF domain.
bandwidth: local AS number:link-bandwidth-number	Link-bandwidth community value used for unequal-cost load balancing. When BGP has several candidate paths available for multipath purposes, it does not perform unequal-cost load balancing according to the link-bandwidth community unless all candidate paths have this attribute.
domain-id	Unique configurable number that identifies the OSPF domain.
domain-id-vendor	Unique configurable number that further identifies the OSPF domain.
<i>link-bandwidth-number</i>	Link-bandwidth number: from 0 through 4,294,967,295 (bytes per second).
<i>local AS number</i>	Local AS number: from 1 through 65,535 .
<i>options</i>	1 byte. Currently this is only used if the route type is 5 or 7 . Setting the least significant bit in the field indicates that the route carries a type 2 metric.
origin	(Used with VPNs) Identifies where the route came from.
<i>ospf-route-type</i>	1 byte, encoded as 1 or 2 for intra-area routes (depending on whether the route came from a type 1 or a type 2 LSA); 3 for summary routes; 5 for external routes (area number must be 0); 7 for NSSA routes; or 129 for sham link endpoint addresses.
route-type-vendor	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x8000 . The format is <i>area-number:ospf-route-type:options</i> .

Table 22: Communities Output Field Values (*continued*)

Value	Description
rte-type	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x0306 . The format is area-number:ospf-route-type:options .
target	Defines which VPN the route participates in; target has the format 32-bit IP address:16-bit number . For example, 10.19.0.0:100.
unknown IANA	Incoming IANA codes with a value between 0x1 and 0x7fff . This code of the BGP extended community attribute is accepted, but it is not recognized.
unknown OSPF vendor community	Incoming IANA codes with a value above 0x8000 . This code of the BGP extended community attribute is accepted, but it is not recognized.

Sample Output

show route detail

```

user@host> show route detail

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
10.10.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 1:31:43
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

10.31.1.0/30 (2 entries, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 2
    Next hop: via so-0/3/0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:30:17
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I
  OSPF Preference: 10
    Next-hop reference count: 1
    Next hop: via so-0/3/0.0, selected
    State: <Int>
    Inactive reason: Route Preference
    Local AS: 69
    Age: 1:30:17 Metric: 1
    ORR Generation-ID: 1
  Area: 0.0.0.0
    Task: OSPF
    AS path: I

```



```

10.31.1.1/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 7
    Interface: so-0/3/0.0
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:30:20
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I

...

10.31.2.0/30 (1 entry, 1 announced)
  *OSPF Preference: 10
    Next-hop reference count: 9
    Next hop: via so-0/3/0.0
    Next hop: 10.31.1.6 via ge-3/1/0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:29:56 Metric: 2
    Area: 0.0.0.0
    ORR Generation-ID: 1
  Task: OSPF
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

172.16.233.2/32 (1 entry, 1 announced)
  *PIM Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:31:45
    Task: PIM Recv
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

172.16.233.22/32 (1 entry, 1 announced)
  *IGMP Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:31:43
    Task: IGMP
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

10.255.70.103/32 (1 entry, 1 announced)
  State: <FlashAll>
  *RSVP Preference: 7
    Next-hop reference count: 6
    Next hop: 10.31.1.6 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 100096

```

```

        State: <Active Int>
        Local AS: 69
        Age: 1:25:49 Metric: 2
        Task: RSVP
        Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
        AS path: I

10.255.71.238/32 (1 entry, 1 announced)
    State: <FlashAll>
    *RSVP Preference: 7
        Next-hop reference count: 6
        Next hop: via so-0/3/0.0 weight 0x1, selected
        Label-switched-path green-r1-r2
        State: <Active Int>
        Local AS: 69
        Age: 1:25:49 Metric: 1
        Task: RSVP
        Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
        AS path: I

private__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

47.0005.80ff.f800.0000.0108.0001.0102.5507.1052/152 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active Int>
        Local AS: 69
        Age: 1:31:44
        Task: IF
        AS path: I

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
0 (1 entry, 1 announced)
    *MPLS Preference: 0
        Next hop type: Receive
        Next-hop reference count: 6
        State: <Active Int>
        Local AS: 69
        Age: 1:31:45 Metric: 1
        Task: MPLS
        Announcement bits (1): 0-KRT
        AS path: I

...

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

299840 (1 entry, 1 announced)
TSI:
KRT in-kerne 299840 /52 -> {indirect(1048575)}
    *RSVP Preference: 7/2
        Next hop type: Flood
        Address: 0x9174a30
        Next-hop reference count: 4
        Next hop type: Router, Next hop index: 798
        Address: 0x9174c28
        Next-hop reference count: 2

```

```

Next hop: 172.16.0.2 via lt-1/2/0.9 weight 0x1
Label-switched-path R2-to-R4-2p2mp
Label operation: Pop
Next hop type: Router, Next hop index: 1048574
Address: 0x92544f0
Next-hop reference count: 2
Next hop: 172.16.0.2 via lt-1/2/0.7 weight 0x1
Label-switched-path R2-to-R200-p2mp
Label operation: Pop
Next hop: 172.16.0.2 via lt-1/2/0.5 weight 0x8001
Label operation: Pop
State: <Active Int>
Age: 1:29      Metric: 1
Task: RSVP
Announcement bits (1): 0-KRT
AS path: I...

800010 (1 entry, 1 announced)
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: via vt-3/2/0.32769, selected
    Label operation: Pop
    State: <Active Int>
    Age: 1:29:30
    Task: Common L2 VC
    Announcement bits (1): 0-KRT
    AS path: I

vt-3/2/0.32769 (1 entry, 1 announced)
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: 10.31.1.6 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 800012, Push 100096(top)
    Protocol next hop: 10.255.70.103
    Push 800012
    Indirect next hop: 87272e4 1048574
    State: <Active Int>
    Age: 1:29:30      Metric2: 2
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 1-Common L2 VC
    AS path: I
    Communities: target:11111:1 Layer2-info: encaps:VPLS,
    control flags:, mtu: 0

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

abcd::10:255:71:52/128 (1 entry, 0 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 1
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:31:44
    Task: IF
    AS path: I

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
    Next hop type: Interface

```

```

        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active NoReadvrt Int>
        Local AS:    69
        Age: 1:31:44
        Task: IF
        AS path: I

ff02::2/128 (1 entry, 1 announced)
  *PIM    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:45
          Task: PIM Recv6
          Announcement bits (1): 0-KRT
          AS path: I

ff02::d/128 (1 entry, 1 announced)
  *PIM    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:45
          Task: PIM Recv6
          Announcement bits (1): 0-KRT
          AS path: I

ff02::16/128 (1 entry, 1 announced)
  *MLD    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:43
          Task: MLD
          Announcement bits (1): 0-KRT
          AS path: I

private.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
          Next hop type: Interface
          Next-hop reference count: 1
          Next hop: via lo0.16385, selected
          State: <Active NoReadvrt Int>
          Age: 1:31:44
          Task: IF
          AS path: I

green.l2vpn.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

10.255.70.103:1:3:1/96 (1 entry, 1 announced)
  *BGP    Preference: 170/-101
          Route Distinguisher: 10.255.70.103:1
          Next-hop reference count: 7
          Source: 10.255.70.103
          Protocol next hop: 10.255.70.103
          Indirect next hop: 2 no-forward
          State: <Secondary Active Int Ext>
          Local AS:    69 Peer AS:    69
```

```

Age: 1:25:49    Metric2: 1
AIGP 210
Task: BGP_69.10.255.70.103+179
Announcement bits (1): 0-green-l2vpn
AS path: I
Communities: target:11111:1 Layer2-info: encaps:VPLS,
control flags:, mtu: 0
Label-base: 800008, range: 8
Localpref: 100
Router ID: 10.255.70.103
Primary Routing Table bgp.l2vpn.0

10.255.71.52:1:1:1/96 (1 entry, 1 announced)
  *L2VPN Preference: 170/-1
    Next-hop reference count: 5
    Protocol next hop: 10.255.71.52
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:31:40    Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:Site-Down,
    mtu: 0
    Label-base: 800016, range: 8, status-vector: 0x9F

10.255.71.52:1:5:1/96 (1 entry, 1 announced)
  *L2VPN Preference: 170/-101
    Next-hop reference count: 5
    Protocol next hop: 10.255.71.52
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:31:40    Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:, mtu: 0
    Label-base: 800008, range: 8, status-vector: 0x9F

...

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.245.255.63:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000[0]
    Protocol next hop: 10.245.255.63 Indirect next hop: 86af000 296
    State: <Active Int>
    Local AS: 99
    Age: 10:21
    Task: l2 circuit
    Announcement bits (1): 0-LDP
    AS path: I
    VC Label 100000, MTU 1500, VLAN ID 512

inet.0: 45 destinations, 47 routes (44 active, 0 holddown, 1 hidden)
1.1.1.3/32 (1 entry, 1 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Router, Next hop index: 580

```

```

Address: 0x9db6ed0
Next-hop reference count: 8
Next hop: 10.1.1.6 via lt-1/0/10.5, selected
Session Id: 0x18a
State: <Active Int>
Local AS: 2
Age: 1:32 Metric: 10
Validation State: unverified
ORR Generation-ID: 1
Task: IS-IS
Announcement bits (3): 0-KRT 5-Resolve tree 4 6-Resolve_IGP_FRR
task
AS path: I

inet.0: 61 destinations, 77 routes (61 active, 1 holddown, 0 hidden)
1.1.1.1/32 (2 entries, 1 announced)
*OSPF Preference: 10
Next hop type: Router, Next hop index: 673
Address: 0xc008830
Next-hop reference count: 3
Next hop: 10.1.1.1 via ge-0/0/2.0, selected
Session Id: 0x1b7
State: <Active Int>
Local AS: 1
Age: 3:06:59 Metric: 100
Validation State: unverified
ORR Generation-ID: 1
Area: 0.0.0.0
Task: OSPF
Announcement bits (2): 1-KRT 9-Resolve tree 2
AS path: I

```

show route detail (with BGP Multipath)

```

user@host> show route detail

10.1.1.8/30 (2 entries, 1 announced)
*BGP Preference: 170/-101
Next hop type: Router, Next hop index: 262142
Address: 0x901a010
Next-hop reference count: 2
Source: 10.1.1.2
Next hop: 10.1.1.2 via ge-0/3/0.1, selected
Next hop: 10.1.1.6 via ge-0/3/0.5
State: <Active Ext>
Local AS: 1 Peer AS: 2
Age: 5:04:43
Validation State: unverified
Task: BGP_2.10.1.1.2+59955
Announcement bits (1): 0-KRT
AS path: 2 I
Accepted Multipath
Localpref: 100
Router ID: 172.16.1.2
BGP Preference: 170/-101
Next hop type: Router, Next hop index: 678
Address: 0x8f97520
Next-hop reference count: 9
Source: 10.1.1.6
Next hop: 10.1.1.6 via ge-0/3/0.5, selected
State: <NotBest Ext>

```

```

Inactive reason: Not Best in its group - Active preferred
Local AS:      1 Peer AS:      2
Age: 5:04:43
Validation State: unverified
Task: BGP_2.10.1.1.6+58198
AS path: 2 I
Accepted MultipathContrib
Localpref: 100
Router ID: 172.16.1.3

```

show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```

user@host> show route label 299872 detail
mpls.0: 13 destinations, 13 routes (13 active, 0 holddown, 0 hidden)
299872 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Next-hop reference count: 3
          Address: 0x9097d90
          Next hop: via vt-0/1/0.1
          Next-hop index: 661
          Label operation: Pop
          Address: 0x9172130
          Next hop: via so-0/0/3.0
          Next-hop index: 654
          Label operation: Swap 299872
          State: **Active Int>
          Local AS: 1001
          Age: 8:20      Metric: 1
          Task: LDP
          Announcement bits (1): 0-KRT
          AS path: I
          FECs bound to route: P2MP root-addr 10.255.72.166, grp 232.1.1.1,
src 192.168.142.2

```

show route label detail (Multipoint LDP with Multicast-Only Fast Reroute)

```

user@host> show route label 301568 detail
mpls.0: 18 destinations, 18 routes (18 active, 0 holddown, 0 hidden)
301568 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Address: 0x2735208
          Next-hop reference count: 3
          Next hop type: Router, Next hop index: 1397
          Address: 0x2735d2c
          Next-hop reference count: 3
          Next hop: 1.3.8.2 via ge-1/2/22.0
          Label operation: Pop
          Load balance label: None;
          Next hop type: Router, Next hop index: 1395
          Address: 0x2736290
          Next-hop reference count: 3
          Next hop: 1.3.4.2 via ge-1/2/18.0
          Label operation: Pop
          Load balance label: None;
          State: <Active Int AckRequest MulticastRPF>
          Local AS: 10
          Age: 54:05      Metric: 1

```

```
Validation State: unverified
Task: LDP
Announcement bits (1): 0-KRT
AS path: I
FECs bound to route: P2MP root-addr 172.16.1.1, grp: 232.1.1.1,
src: 192.168.219.11
Primary Upstream : 172.16.1.3:0--172.16.1.2:0
  RPF Nexthops :
    ge-1/2/15.0, 1.2.94.1, Label: 301568, weight: 0x1
    ge-1/2/14.0, 1.2.3.1, Label: 301568, weight: 0x1
Backup Upstream : 172.16.1.3:0--172.16.1.6:0
  RPF Nexthops :
    ge-1/2/20.0, 1.2.96.1, Label: 301584, weight: 0xffffe
    ge-1/2/19.0, 1.3.6.1, Label: 301584, weight: 0xffffe
```


show route exact

List of Syntax	Syntax on page 333 Syntax (EX Series Switches) on page 333
Syntax	<code>show route exact <i>destination-prefix</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route exact <i>destination-prefix</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display only the routes that exactly match the specified address or range of addresses.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . <i>destination-prefix</i> —Address or range of addresses. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
List of Sample Output	show route exact on page 333 show route exact detail on page 334 show route exact extensive on page 334 show route exact terse on page 334
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route exact

```

user@host> show route exact 207.17.136.0/24

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
207.17.136.0/24    *[Static/5] 2d 03:30:22
                  > to 192.168.71.254 via fxp0.0

```

show route exact detail

```
user@host> show route exact 207.17.136.0/24 detail

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
207.17.136.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2d 3:30:26
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I
```

show route exact extensive

```
user@host> show route exact 207.17.136.0/24 extensive

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
207.17.136.0/24 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.0/24 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 1:25:18
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I
```

show route exact terse

```
user@host> show route exact 207.17.136.0/24 terse

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both
A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* 207.17.136.0/24  S  5                >192.168.71.254
```

show route export

List of Syntax	Syntax on page 335 Syntax (EX Series Switches) on page 335
Syntax	<pre>show route export <brief detail> <instance <instance-name> routing-table-name> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show route export <brief detail> <instance <instance-name> routing-table-name></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display policy-based route export information. Policy-based export simplifies the process of exchanging route information between routing instances.</p>
Options	<p>none—(Same as brief.) Display standard information about policy-based export for all instances and routing tables on all systems.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>instance <instance-name>—(Optional) Display a particular routing instance for which policy-based export is currently enabled.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>routing-table-name—(Optional) Display information about policy-based export for all routing tables whose name begins with this string (for example, inet.0 and inet6.0 are both displayed when you run the show route export inet command).</p>
Required Privilege Level	view
List of Sample Output	show route export on page 336 show route export detail on page 336 show route export instance detail on page 337
Output Fields	<p>Table 23 on page 336 lists the output fields for the show route export command. Output fields are listed in the approximate order in which they appear.</p>

Table 23: show route export Output Fields

Field Name	Field Description	Level of Output
Table or <i>table-name</i>	Name of the routing tables that either import or export routes.	All levels
Routes	Number of routes exported from this table into other tables. If a particular route is exported to different tables, the counter will only increment by one.	brief none
Export	Whether the table is currently exporting routes to other tables: Y or N (Yes or No).	brief none
Import	Tables currently importing routes from the originator table. (Not displayed for tables that are not exporting any routes.)	detail
Flags	(instance keyword only) Flags for this feature on this instance: <ul style="list-style-type: none"> config auto-policy—The policy was deduced from the configured IGP export policies. cleanup—Configuration information for this instance is no longer valid. config—The instance was explicitly configured. 	detail
Options	(instance keyword only) Configured option displays the type of routing tables the feature handles: <ul style="list-style-type: none"> unicast—Indicates <i>instance.inet.0</i>. multicast—Indicates <i>instance.inet.2</i>. unicast multicast—Indicates <i>instance.inet.0</i> and <i>instance.inet.2</i>. 	detail
Import policy	(instance keyword only) Policy that route export uses to construct the import-export matrix. Not displayed if the instance type is vrf .	detail
Instance	(instance keyword only) Name of the routing instance.	detail
Type	(instance keyword only) Type of routing instance: forwarding , non-forwarding , or vrf .	detail

Sample Output

show route export

```

user@host> show route export
Table           Export      Routes
inet.0          N           0
black.inet.0    Y           3
red.inet.0      Y           4

```

show route export detail

```

user@host> show route export detail
inet.0                      Routes:      0
black.inet.0                Routes:      3
  Import: [ inet.0 ]
red.inet.0                  Routes:      4
  Import: [ inet.0 ]

```

show route export instance detail

```
user@host> show route export instance detail
Instance: master                               Type: forwarding
  Flags: <config auto-policy> Options: <unicast multicast>
  Import policy: [ (ospf-master-from-red || isis-master-from-black) ]
Instance: black                               Type: non-forwarding
Instance: red                                 Type: non-forwarding
```

show route extensive

List of Syntax	Syntax on page 338 Syntax (EX Series Switches) on page 338
Syntax	<pre>show route extensive <destination-prefix> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show route extensive <destination-prefix></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	Display extensive information about the active entries in the routing tables.
Options	<p>none—Display all active entries in the routing table.</p> <p>destination-prefix—(Optional) Display active entries for the specified address or range of addresses.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route extensive on page 345 show route extensive (Access Route) on page 352 show route extensive (BGP PIC Edge) on page 352 show route extensive (FRR and LFA) on page 353 show route extensive (IS-IS) on page 354 show route extensive (Route Reflector) on page 354 show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 354 show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 355
Output Fields	<p>Table 24 on page 338 describes the output fields for the show route extensive command. Output fields are listed in the approximate order in which they appear.</p>

Table 24: show route extensive Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). • hidden (routes that are not used because of a routing policy).
<i>route-destination</i> (entry, announced)	<p>Route destination (for example: 10.0.0.1/24). The entry value is the number of route for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote.
TSI	Protocol header information.
label stacking	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of two or more exits this router with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).
[protocol, preference]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • —A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
Level	(IS-IS only). In IS-IS, a single autonomous system (AS) can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).
Next-hop type	Type of next hop. For a description of possible values for this field, see the Output Field table in the show route detail command.
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path lsp-path-name	Name of the LSP used to reach the next hop.
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Offset	Whether the metric has been increased or decreased by an offset value.
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to recursively derive a forwarding next hop.

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>label-operation</i>	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Indirect next hops	<p>When present, a list of nodes that are used to resolve the path to the next-hop destination, in the order that they are resolved.</p> <p>When BGP PIC Edge is enabled, the output lines that contain Indirect next hop: weight follow next hops that the software can use to repair paths where a link failure occurs. The next-hop weight has one of the following values:</p> <ul style="list-style-type: none"> • 0x1 indicates active next hops. • 0x4000 indicates passive next hops.
State	State of the route (a route can be in more than one state). See the Output Field table in the show route detail command.
Session ID	The BFD session ID number that represents the protection using MPLS fast reroute (FRR) and loop-free alternate (LFA).
Weight	<p>Weight for the backup path. If the weight of an indirect next hop is larger than zero, the weight value is shown.</p> <p>For sample output, see show route table.</p>

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
Inactive reason	<p>If the route is inactive, the reason for its current state is indicated. Typical reasons include:</p> <ul style="list-style-type: none"> • Active preferred—Currently active route was selected over this route. • Always compare MED—Path with a lower multiple exit discriminator (MED) is available. • AS path—Shorter AS path is available. • Cisco Non-deterministic MED selection—Cisco nondeterministic MED is enabled and a path with a lower MED is available. • Cluster list length—Path with a shorter cluster list length is available. • Forwarding use only—Path is only available for forwarding purposes. • IGP metric—Path through the next hop with a lower IGP metric is available. • IGP metric type—Path with a lower OSPF link-state advertisement type is available. • Interior > Exterior > Exterior via Interior—Direct, static, IGP, or EBGp path is available. • Local preference—Path with a higher local preference value is available. • Next hop address—Path with a lower metric next hop is available. • No difference—Path from a neighbor with a lower IP address is available. • Not Best in its group—Occurs when multiple peers of the same external AS advertise the same prefix and are grouped together in the selection process. When this reason is displayed, an additional reason is provided (typically one of the other reasons listed). • Number of gateways—Path with a higher number of next hops is available. • Origin—Path with a lower origin code is available. • OSPF version—Path does not support the indicated OSPF version. • RIB preference—Route from a higher-numbered routing table is available. • Route distinguisher—64-bit prefix added to IP subnets to make them unique. • Route metric or MED comparison—Route with a lower metric or MED is available. • Route preference—Route with a lower preference value is available. • Router ID—Path through a neighbor with a lower ID is available. • Unusable path—Path is not usable because of one of the following conditions: the route is damped, the route is rejected by an import policy, or the route is unresolved. • Update source—Last tiebreaker is the lowest IP address value.
Local AS	Autonomous system (AS) number of the local routing device.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	<p>For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances.</p> <p>For sample output, see show route table.</p>

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
Task	Name of the protocol that has added the route.
Announcement bits	<p>List of protocols that are consumers of the route. Using the following output as an example, Announcement bits (3): 0-KRT 5-Resolve tree 2 8-BGP RT Background there are (3) announcement bits to reflect the three clients (protocols) that have state for this route: Kernel (0-KRT), 5 (resolution tree process 2), and 8 (BGP).</p> <p>The notation <i>n</i>-Resolve inet indicates that the route is used for route resolution for next hops found in the routing table. <i>n</i> is an index used by Juniper Networks customer support only.</p>
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • Recorded—The AS path is recorded by the sample process (sampled). • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
FECs bound to route	Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
AS path: I <Originator>	(For route reflected output only) Originator ID attribute set by the route reflector.

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
route status	<p>Indicates the status of a BGP route:</p> <ul style="list-style-type: none"> • Accepted—The specified BGP route is imported by the default BGP policy. • Import—The route is imported into a Layer 3 VPN routing instance. • Import-Protect—A remote instance egress that is protected. • Multipath—A BGP multipath active route. • MultipathContrib—The route is not active but contributes to the BGP multipath. • Protect—An egress route that is protected. • Stale—A route that is marked stale due to graceful restart.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.
Originator ID	(For route reflected output only) Address of router that originally sent the route to the route reflector.
Prefixes bound to route	Forwarding Equivalent Class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See the Output Field table in the show route detail command for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down.
mtu	Maximum transmission unit (MTU) information.
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.

Table 24: show route extensive Output Fields (*continued*)

Field Name	Field Description
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.
Originating RIB	Name of the routing table whose active route was used to determine the forwarding next-hop entry in the resolution database. For example, in the case of inet.0 resolving through inet.0 and inet.3, this field indicates which routing table, inet.0 or inet.3, provided the best path for a particular prefix.
Node path count	Number of nodes in the path.
Forwarding nexthops	Number of forwarding next hops. The forwarding next hop is the network layer address of the directly reachable neighboring system (if applicable) and the interface used to reach it.

Sample Output

show route extensive

```

user@host> show route extensive
inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
203.0.113.10/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.10/16 -> {192.168.71.254}
    *Static Preference: 5
        Next-hop reference count: 29
        Next hop: 192.168.71.254 via fxp0.0, selected
        State: <Active NoReadvrt Int Ext>
        Local AS: 64496
        Age: 1:34:06
        Task: RT
        Announcement bits (2): 0-KRT 3-Resolve tree 2
        AS path: I

203.0.113.30/30 (2 entries, 1 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 2
        Next hop: via so-0/3/0.0, selected
        State: <Active Int>
        Local AS: 64496
        Age: 1:32:40
        Task: IF
        Announcement bits (1): 3-Resolve tree 2
        AS path: I
    OSPF Preference: 10
        Next-hop reference count: 1
        Next hop: via so-0/3/0.0, selected

```

```
State: <Int>
Inactive reason: Route Preference
Local AS: 64496
Age: 1:32:40 Metric: 1
Area: 0.0.0.0
Task: OSPF
AS path: I

203.0.113.103/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 7
    Interface: so-0/3/0.0
    State: <Active NoReadvrt Int>
    Local AS: 644969
    Age: 1:32:43
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I

...

203.0.113.203/30 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.203/30 -> {203.0.113.216}
  *OSPF Preference: 10
    Next-hop reference count: 9
    Next hop: via so-0/3/0.0
    Next hop: 203.0.113.216 via ge-3/1/0.0, selected
    State: <Active Int>
    Local AS: 64496
    Age: 1:32:19 Metric: 2
    Area: 0.0.0.0
    Task: OSPF
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

198.51.100.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.2/32 -> {}
  *PIM Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 64496
    Age: 1:34:08
    Task: PIM Recv
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

198.51.100.22/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.22/32 -> {}
  *IGMP Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 64496
    Age: 1:34:06
```

```

Task: IGMP
Announcement bits (2): 0-KRT 3-Resolve tree 2
AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

203.0.113.103/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
Label-switched-path green-r1-r3
Label operation: Push 100096
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 2
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

203.0.113.238/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: via so-0/3/0.0 weight 0x1, selected
Label-switched-path green-r1-r2
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 1
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

...

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

47.0005.80ff.f800.0000.0108.0001.0102.5507.1052/152 (1 entry, 0 announced)
*Direct Preference: 0
Next hop type: Interface
Next-hop reference count: 1
Next hop: via lo0.0, selected
State: <Active Int>
Local AS: 64496
Age: 1:34:07
Task: IF
AS path: I

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

0 (1 entry, 1 announced)
TSI:
KRT in-kernel 0 /36 -> {}
*MPLS Preference: 0
Next hop type: Receive
Next-hop reference count: 6
State: <Active Int>
Local AS: 64496
Age: 1:34:08 Metric: 1

```

```

Task: MPLS
Announcement bits (1): 0-KRT
AS path: I

...

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
299840 (1 entry, 1 announced)
TSI:
KRT in-kernel 299840 /52 -> {indirect(1048575)}
  *RSVP Preference: 7/2
    Next hop type: Flood
    Address: 0x9174a30
    Next-hop reference count: 4
    Next hop type: Router, Next hop index: 798
    Address: 0x9174c28
    Next-hop reference count: 2
    Next hop: 198.51.100.2 via lt-1/2/0.9 weight 0x1
    Label-switched-path R2-to-R4-2p2mp
    Label operation: Pop
    Next hop type: Router, Next hop index: 1048574
    Address: 0x92544f0
    Next-hop reference count: 2
    Next hop: 198.51.100.2 via lt-1/2/0.7 weight 0x1
    Label-switched-path R2-to-R200-p2mp
    Label operation: Pop
    Next hop: 198.51.100.2 via lt-1/2/0.5 weight 0x8001
    Label operation: Pop
    State: <Active Int>
    Age: 1:29 Metric: 1
    Task: RSVP
    Announcement bits (1): 0-KRT
    AS path: I...

800010 (1 entry, 1 announced)
TSI:
KRT in-kernel 800010 /36 -> {vt-3/2/0.32769}
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: via vt-3/2/0.32769, selected
    Label operation: Pop
    State: <Active Int>
    Age: 1:31:53
    Task: Common L2 VC
    Announcement bits (1): 0-KRT
    AS path: I

vt-3/2/0.32769 (1 entry, 1 announced)
TSI:
KRT in-kernel vt-3/2/0.32769.0 /16 -> {indirect(1048574)}
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 800012, Push 100096(top)
    Protocol next hop: 203.0.113.103
    Push 800012
    Indirect next hop: 87272e4 1048574
    State: <Active Int>
    Age: 1:31:53 Metric2: 2

```



```

Task: Common L2 VC
Announcement bits (2): 0-KRT 1-Common L2 VC
AS path: I
Communities: target:11111:1 Layer2-info: encaps:VPLS,
control flags:, mtu: 0
Indirect next hops: 1
    Protocol next hop: 203.0.113.103 Metric: 2
    Push 800012
    Indirect next hop: 87272e4 1048574
    Indirect path forwarding next hops: 1
        Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1

203.0.113.103/32 Originating RIB: inet.3
    Metric: 2                                Node path count: 1
    Forwarding nexthops: 1
        Nexthop: 203.0.113.216 via ge-3/1/0.0

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

2001:db8::10:255:71:52/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

ff02::2/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::2/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08
        Task: PIM Recv6
        Announcement bits (1): 0-KRT
        AS path: I

ff02::d/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::d/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08

```

```

Task: PIM Recv6
Announcement bits (1): 0-KRT
AS path: I

ff02::16/128 (1 entry, 1 announced)
TSI:
KRT in-kerne| ff02::16/128 -> {}
  *MLD    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS: 64496
          Age: 1:34:06
          Task: MLD
          Announcement bits (1): 0-KRT
          AS path: I

private.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
          Next hop type: Interface
          Next-hop reference count: 1
          Next hop: via lo0.16385, selected
          State: <Active NoReadvrt Int>
          Age: 1:34:07
          Task: IF
          AS path: I

green.l2vpn.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

203.0.113.103:1:3:1/96 (1 entry, 1 announced)
  *BGP    Preference: 170/-101
          Route Distinguisher: 203.0.113.103:1
          Next-hop reference count: 7
          Source: 203.0.113.103
          Protocol next hop: 203.0.113.103
          Indirect next hop: 2 no-forward
          State: <Secondary Active Int Ext>
          Local AS: 64496 Peer AS: 64496
          Age: 1:28:12 Metric2: 1
          Task: BGP_69.203.0.113.103+179
          Announcement bits (1): 0-green-l2vpn
          AS path: I
          Communities: target:11111:1 Layer2-info: encaps:VPLS,
          control flags:, mtu: 0
          Label-base: 800008, range: 8
          Localpref: 100
          Router ID: 203.0.113.103
          Primary Routing Table bgp.l2vpn.0

203.0.113.152:1:1:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699540
  *L2VPN  Preference: 170/-1
          Next-hop reference count: 5
          Protocol next hop: 203.0.113.152
          Indirect next hop: 0 -
          State: <Active Int Ext>
          Age: 1:34:03 Metric2: 1
          Task: green-l2vpn
          Announcement bits (1): 1-BGP.0.0.0.0+179

```

```

AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down,
mtu: 0
Label-base: 800016, range: 8, status-vector: 0x9F

203.0.113.152:1:5:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699528
  *L2VPN Preference: 170/-101
    Next-hop reference count: 5
    Protocol next hop: 203.0.113.152
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:34:03 Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:, mtu: 0
    Label-base: 800008, range: 8, status-vector: 0x9F

...

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
TSI:

203.0.113.163:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000[0]
    Protocol next hop: 203.0.113.163 Indirect next hop: 86af000 296
    State: <Active Int>
    Local AS: 64499
    Age: 10:21
    Task: l2 circuit
    Announcement bits (1): 0-LDP
    AS path: I
    VC Label 100000, MTU 1500, VLAN ID 512

203.0.113.55/24 (1 entry, 1 announced)
TSI:
KRT queued (pending) add
  198.51.100.0/24 -> {Push 300112}
    *BGP Preference: 170/-101
      Next hop type: Router
      Address: 0x925c208
      Next-hop reference count: 2
      Source: 203.0.113.9
      Next hop: 203.0.113.9 via ge-1/2/0.15, selected
      Label operation: Push 300112
      Label TTL action: prop-ttl
      State: <Active Ext>
      Local AS: 64509 Peer AS: 65539
      Age: 1w0d 23:06:56
      AIGP: 25
      Task: BGP_65539.203.0.113.9+56732
      Announcement bits (1): 0-KRT
      AS path: 65539 64508 I
      Accepted

```

```

Route Label: 300112
Localpref: 100
Router ID: 213.0.113.99

```

show route extensive (Access Route)

```

user@host> show route 203.0.113.102 extensive
inet.0: 39256 destinations, 39258 routes (39255 active, 0 holddown, 1 hidden)
203.0.113.102/32 (1 entry, 1 announced)
TSI:
KRT in-kerne1 203.0.113.102/32 -> {192.0.2.2}
OSPF area : 0.0.0.0, LSA ID : 203.0.113.102, LSA type : Extern
  *Access Preference: 13
    Next-hop reference count: 78472
    Next hop: 192.0.2.2 via fe-0/0/0.0, selected
    State: <Active Int>
  Age: 12
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 1-OSPFv2
    AS path: I

```

```

user@host> show route 2001:db8:4641:1::/48 extensive

inet6.0: 75 destinations, 81 routes (75 active, 0 holddown, 0 hidden)
2001:db8:4641:1::/48 (1 entry, 1 announced)
TSI:
KRT in-kerne1 2001:db8:4641:1::/48 -> {#0 0.13.1.0.0.1}
  *Access Preference: 13
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I
2001:db8:4641:1::/128 (1 entry, 1 announced)
TSI:
KRT in-kerne1 2001:db8:4641:1::/128 -> {#0 0.13.1.0.0.1}
  *Access-internal Preference: 12
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I

```

show route extensive (BGP PIC Edge)

```

user@host> show route 198.51.100.6 extensive
ed.inet.0: 6 destinations, 9 routes (6 active, 0 holddown, 0 hidden)
198.51.100.6/32 (3 entries, 2 announced)

```

```

        State: <CalcForwarding>
TSI:
KRT in-kerne1 198.51.100.6/32 -> {indirect(1048574), indirect(1048577)}
Page 0 idx 0 Type 1 val 9219e30
  Nexthop: Self
  AS path: [2] 3 I
  Communities: target:2:1
Path 198.51.100.6 from 198.51.100.4 Vector len 4. Val: 0
..
    #Multipath Preference: 255
      Next hop type: Indirect
      Address: 0x93f4010
      Next-hop reference count: 2
..
      Protocol next hop: 198.51.1001.4
      Push 299824
      Indirect next hop: 944c000 1048574 INH Session ID: 0x3
      Indirect next hop: weight 0x1
      Protocol next hop: 198.51.100.5
      Push 299824
      Indirect next hop: 944c1d8 1048577 INH Session ID: 0x4
      Indirect next hop: weight 0x4000
      State: <ForwardingOnly Int Ext>
      Inactive reason: Forwarding use only
      Age: 25          Metric2: 15
      Validation State: unverified
      Task: RT
      Announcement bits (1): 0-KRT
      AS path: 3 I
      Communities: target:2:1

```

show route extensive (FRR and LFA)

```

user@host> show route 203.0.113.20 extensive
inet.0: 46 destinations, 49 routes (45 active, 0 holddown, 1 hidden)
203.0.113.20/24 (2 entries, 1 announced)
  State: FlashAll
TSI:
KRT in-kerne1 203.0.113.20/24 -> {Push 299776, Push 299792}
  *RSVP Preference: 7/1
    Next hop type: Router, Next hop index: 1048574
    Address: 0xbbbc010
    Next-hop reference count: 5
    Next hop: 203.0.113.112 via ge-2/1/8.0 weight 0x1, selected
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299776
    Label TTL action: prop-ttl
    Session Id: 0x201
    Next hop: 203.0.113.122 via ge-2/1/4.0 weight 0x4001
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299792
    Label TTL action: prop-ttl
    Session Id: 0x202
    State: Active Int
    Local AS: 64500
    Age: 5:31 Metric: 2
    Task: RSVP
    Announcement bits (1): 0-KRT
    AS path: I
  OSPF Preference: 10
    Next hop type: Router, Next hop index: 615

```

```
Address: 0xb9d78c4
Next-hop reference count: 7
Next hop: 203.0.113.112 via ge-2/1/8.0, selected
Session Id: 0x201
State: Int
Inactive reason: Route Preference
Local AS: 64500
Age: 5:35 Metric: 3
Area: 0.0.0.0
Task: OSPF
AS path: I
```

show route extensive (IS-IS)

```
user@host> show route extensive
IS-IS Preference: 15
Level: 1
Next hop type: Router, Next hop index: 1048577
Address: 0xFFFFFFFF
Next-hop reference count: YY
Next hop: 203.0.113.22 via ae1.0 balance 43%, selected
Session Id: 0x141
Next hop: 203.0.113.22 via ae0.0 balance 57%
```

show route extensive (Route Reflector)

```
user@host> show route extensive
203.0.113.0/8 (1 entry, 1 announced)

TSI:
KRT in-kernel 203.0.113.0/8 -> {indirect(40)}
  *BGP Preference: 170/-101
    Source: 192.168.4.214
    Protocol next hop: 198.51.100.192 Indirect next hop: 84ac908 40
    State: <Active Int Ext>
    Local AS: 65548 Peer AS: 65548
    Age: 3:09 Metric: 0 Metric2: 0
    Task: BGP_65548.192.168.4.214+1033
    Announcement bits (2): 0-KRT 4-Resolve inet.0
    AS path: 65544 64507 I <Originator>
    Cluster list: 198.51.100.1
    Originator ID: 203.0.113.88
    Communities: 7777:7777
    Localpref: 100
    Router ID: 203.0.113.4
    Indirect next hops: 1
      Protocol next hop: 203.0.113.192 Metric: 0
      Indirect next hop: 84ac908 40
      Indirect path forwarding next hops: 0
      Next hop type: Discard
```

show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```
user@host> show route label 299872 detail
mpls.0: 13 destinations, 13 routes (13 active, 0 holddown, 0 hidden)
299872 (1 entry, 1 announced)
  *LDP Preference: 9
    Next hop type: Flood
    Next-hop reference count: 3
    Address: 0x9097d90
```

```

Next hop: via vt-0/1/0.1
Next-hop index: 661
Label operation: Pop
Address: 0x9172130
Next hop: via so-0/0/3.0
Next-hop index: 654
Label operation: Swap 299872
State: **Active Int>
Local AS: 64511
Age: 8:20      Metric: 1
Task: LDP
Announcement bits (1): 0-KRT
AS path: I
FECs bound to route: P2MP root-addr 203.0.113.166, grp 203.0.1.1,
src 192.168.142.2

```

show route label detail (Multipoint LDP with Multicast-Only Fast Reroute)

```

user@host> show route label 301568 detail

mpls.0: 18 destinations, 18 routes (18 active, 0 holddown, 0 hidden)
301568 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Address: 0x2735208
          Next-hop reference count: 3
          Next hop type: Router, Next hop index: 1397
          Address: 0x2735d2c
          Next-hop reference count: 3
          Next hop: 203.0.113.82 via ge-1/2/22.0
          Label operation: Pop
          Load balance label: None;
          Next hop type: Router, Next hop index: 1395
          Address: 0x2736290
          Next-hop reference count: 3
          Next hop: 203.0.113.2 via ge-1/2/18.0
          Label operation: Pop
          Load balance label: None;
          State: <Active Int AckRequest MulticastRPF>
          Local AS: 64500
          Age: 54:05      Metric: 1
          Validation State: unverified
          Task: LDP
          Announcement bits (1): 0-KRT
          AS path: I
          FECs bound to route: P2MP root-addr 198.51.100.1, grp: 232.1.1.1,
src: 192.168.219.11
          Primary Upstream : 198.51.100.3:0--198.51.100.2:0
            RPF Nexthops :
              ge-1/2/15.0, 1.2.94.1, Label: 301568, weight: 0x1
              ge-1/2/14.0, 1.2.3.1, Label: 301568, weight: 0x1
          Backup Upstream : 198.51.100.3:0--198.51.100.6:0
            RPF Nexthops :
              ge-1/2/20.0, 198.51.100.96, Label: 301584, weight: 0xffffe
              ge-1/2/19.0, 198.51.100.36, Label: 301584, weight: 0xffffe

```

show route forwarding-table

- List of Syntax** [Syntax on page 356](#)
 [Syntax \(MX Series Routers\) on page 356](#)
 [Syntax \(TX Matrix and TX Matrix Plus Routers\) on page 356](#)

Syntax show route forwarding-table
 <detail | extensive | summary>
 <all>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <label *name*>
 <matching *matching*>
 <multicast>
 <table (default | *logical-system-name/routing-instance-name* | *routing-instance-name*)>
 <vlan (all | *vlan-name*)>
 <vpn *vpn*>

Syntax (MX Series Routers) show route forwarding-table
 <detail | extensive | summary>
 <all>
 <bridge-domain (all | *domain-name*)>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <label *name*>
 <learning-vlan-id *learning-vlan-id*>
 <matching *matching*>
 <multicast>
 <table (default | *logical-system-name/routing-instance-name* | *routing-instance-name*)>
 <vlan (all | *vlan-name*)>
 <vpn *vpn*>

Syntax (TX Matrix and TX Matrix Plus Routers) show route forwarding-table
 <detail | extensive | summary>
 <all>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <matching *matching*>
 <label *name*>
 <lcc *number*>
 <multicast>
 <table *routing-instance-name*>
 <vpn *vpn*>

Release Information Command introduced before Junos OS Release 7.4.
 Option **bridge-domain** introduced in Junos OS Release 7.5

Option **learning-vlan-id** introduced in Junos OS Release 8.4
 Options **all** and **vlan** introduced in Junos OS Release 9.6.
 Command introduced in Junos OS Release 11.3 for the QFX Series.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display the Routing Engine's forwarding table, including the network-layer prefixes and their next hops. This command is used to help verify that the routing protocol process has relayed the correction information to the forwarding table. The Routing Engine constructs and maintains one or more routing tables. From the routing tables, the Routing Engine derives a table of active routes, called the forwarding table.



NOTE: The Routing Engine copies the forwarding table to the Packet Forwarding Engine, the part of the router that is responsible for forwarding packets. To display the entries in the Packet Forwarding Engine's forwarding table, use the **show pfe route** command.

Options **none**—Display the routes in the forwarding tables. By default, the **show route forwarding-table** command does not display information about private, or internal, forwarding tables.

detail | extensive | summary—(Optional) Display the specified level of output.

all—(Optional) Display routing table entries for all forwarding tables, including private, or internal, tables.

bridge-domain (all | bridge-domain-name)—(MX Series routers only) (Optional) Display route entries for all bridge domains or the specified bridge domain.

ccc interface-name—(Optional) Display route entries for the specified circuit cross-connect interface.

destination destination-prefix—(Optional) Destination prefix.

family family—(Optional) Display routing table entries for the specified family: **bridge** (ccc | destination | detail | extensive | interface-name | label | learning-vlan-id | matching | multicast | summary | table | vlan | vpn), **ethernet-switching**, **evpn**, **fibre-channel**, **fmembers**, **inet**, **inet6**, **iso**, **mcsnoop-inet**, **mcsnoop-inet6**, **mpls**, **satellite-inet**, **satellite-inet6**, **satellite-vpls**, **tnp**, **unix**, **vpls**, or **vlan-classification**.

interface-name interface-name—(Optional) Display routing table entries for the specified interface.

label name—(Optional) Display route entries for the specified label.

lcc number—(TX Matrix and TX matrix Plus routers only) (Optional) On a routing matrix composed of a TX Matrix router and T640 routers, display information for the specified T640 router (or line-card chassis) connected to the TX Matrix router. On a routing matrix composed of the TX Matrix Plus router and T1600 or T4000 routers,

display information for the specified router (line-card chassis) connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

learning-vlan-id *learning-vlan-id*—(MX Series routers only) (Optional) Display learned information for all VLANs or for the specified VLAN.

matching *matching*—(Optional) Display routing table entries matching the specified prefix or prefix length.

multicast—(Optional) Display routing table entries for multicast routes.

table —(Optional) Display route entries for all the routing tables in the main routing instance or for the specified routing instance. If your device supports logical systems, you can also display route entries for the specified logical system and routing instance. To view the routing instances on your device, use the [show route instance](#) command.

vlan (**all** | *vlan-name*)—(Optional) Display information for all VLANs or for the specified VLAN.

vpn *vpn*—(Optional) Display routing table entries for a specified VPN.

Required Privilege Level

view

List of Sample Output

[show route forwarding-table on page 363](#)
[show route forwarding-table detail on page 364](#)
[show route forwarding-table destination extensive \(Weights and Balances\) on page 364](#)
[show route forwarding-table extensive on page 365](#)
[show route forwarding-table extensive \(RPF\) on page 366](#)
[show route forwarding-table \(dynamic list next hop\) on page 367](#)
[show route forwarding-table family mpls on page 368](#)
[show route forwarding-table family mpls ccc ge-0/0/1.1004 on page 368](#)
[show route forwarding-table family vpls on page 368](#)
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled\) on page 368](#)
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled with MAC Statistics\) on page 369](#)
[show route forwarding-table family vpls extensive on page 369](#)

[show route forwarding-table table default on page 370](#)

[show route forwarding-table table](#)

[logical-system-name/routing-instance-name on page 371](#)

[show route forwarding-table vpn on page 372](#)

Output Fields Table 25 on page 359 lists the output fields for the **show route forwarding-table** command. Output fields are listed in the approximate order in which they appear. Field names might be abbreviated (as shown in parentheses) when no level of output is specified, or when the **detail** keyword is used instead of the **extensive** keyword.

Table 25: show route forwarding-table Output Fields

Field Name	Field Description	Level of Output
Logical system	Name of the logical system. This field is displayed if you specify the table logical-system-name/routing-instance-name option on a device that is configured for and supports logical systems.	All levels
Routing table	Name of the routing table (for example, inet, inet6, mpls).	All levels

Table 25: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled protocols	<p>The features and protocols that have been enabled for a given routing table. This field can contain the following values:</p> <ul style="list-style-type: none"> • BUM hashing—BUM hashing is enabled. • MAC Stats—Mac Statistics is enabled. • Bridging—Routing instance is a normal layer 2 bridge. • No VLAN—No VLANs are associated with the bridge domain. • All VLANs—The vlan-id all statement has been enabled for this bridge domain. • Single VLAN—Single VLAN ID is associated with the bridge domain. • MAC action drop—New MACs will be dropped when the MAC address limit is reached. • Dual VLAN—Dual VLAN tags are associated with the bridge domain • No local switching—No local switching is enabled for this routing instance.. • Learning disabled—Layer 2 learning is disabled for this routing instance. • MAC limit reached—The maximum number of MAC addresses that was configured for this routing instance has been reached. • VPLS—The VPLS protocol is enabled. • No IRB I2-copy—The no-irb-layer-2-copy feature is enabled for this routing instance. • ACKed by all peers—All peers have acknowledged this routing instance. • BUM Pruning—BUM pruning is enabled on the VPLS instance. • Def BD VXLAN—VXLAN is enabled for the default bridge domain. • EVPN—EVPN protocol is enabled for this routing instance. • Def BD OVSDb—Open vSwitch Database (OVSDb) is enabled on the default bridge domain. • Def BD Ingress replication—VXLAN ingress node replication is enabled on the default bridge domain. • L2 backhaul—Layer 2 backhaul is enabled. • FRR optimize—Fast reroute optimization • MAC pinning—MAC pinning is enabled for this bridge domain. • MAC Aging Timer—The MAC table aging time is set per routing instance. • EVPN VXLAN—This routing instance supports EVPN with VXLAN encapsulation. • PBBN—This routing instance is configured as a provider backbone bridged network. • PBN—This routing instance is configured as a provider bridge network. • ETREE—The ETREE protocol is enabled on this EVPN routing instance. • ARP/NDP suppression—EVPN ARP NDP suppression is enabled in this routing instance. • Def BD EVPN VXLAN—EVPN VXLAN is enabled for the default bridge domain. • MPLS control word—Control word is enabled for this MPLS routing instance. 	All levels
Address family	Address family (for example, IP, IPv6, ISO, MPLS, and VPLS).	All levels
Destination	Destination of the route.	detail extensive

Table 25: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Route Type (Type)	<p>How the route was placed into the forwarding table. When the detail keyword is used, the route type might be abbreviated (as shown in parentheses):</p> <ul style="list-style-type: none"> • cloned (clon)—(TCP or multicast only) Cloned route. • destination (dest)—Remote addresses directly reachable through an interface. • destination down (iddn)—Destination route for which the interface is unreachable. • interface cloned (ifcl)—Cloned route for which the interface is unreachable. • route down (ifdn)—Interface route for which the interface is unreachable. • ignore (ignr)—Ignore this route. • interface (intf)—Installed as a result of configuring an interface. • permanent (perm)—Routes installed by the kernel when the routing table is initialized. • user—Routes installed by the routing protocol process or as a result of the configuration. 	All levels
Route Reference (RtRef)	Number of routes to reference.	detail extensive
Flags	<p>Route type flags:</p> <ul style="list-style-type: none"> • none—No flags are enabled. • accounting—Route has accounting enabled. • cached—Cache route. • incoming-iface interface-number—Check against incoming interface. • prefix load balance—Load balancing is enabled for this prefix. • rt nh decoupled—Route has been decoupled from the next hop to the destination. • sent to PFE—Route has been sent to the Packet Forwarding Engine. • static—Static route. 	extensive
Next hop	IP address of the next hop to the destination.	detail extensive

Table 25: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Next hop Type (Type)	<p>Next-hop type. When the detail keyword is used, the next-hop type might be abbreviated (as indicated in parentheses):</p> <ul style="list-style-type: none"> • broadcast (bcst)—Broadcast. • deny—Deny. • discard (dscd) —Discard. • hold—Next hop is waiting to be resolved into a unicast or multicast type. • indexed (idxd)—Indexed next hop. • indirect (indr)—Indirect next hop. • local (locl)—Local address on an interface. • routed multicast (mcrst)—Regular multicast next hop. • multicast (mcst)—Wire multicast next hop (limited to the LAN). • multicast discard (mdsc)—Multicast discard. • multicast group (mgrp)—Multicast group member. • receive (rcv)—Receive. • reject (rjct)—Discard. An ICMP unreachable message was sent. • resolve (rslv)—Resolving the next hop. • unicast (ucst)—Unicast. • unilist (ulst)—List of unicast next hops. A packet sent to this next hop goes to any next hop in the list. 	detail extensive
Index	Software index of the next hop that is used to route the traffic for a given prefix.	detail extensive none
Route interface-index	Logical interface index from which the route is learned. For example, for interface routes, this is the logical interface index of the route itself. For static routes, this field is zero. For routes learned through routing protocols, this is the logical interface index from which the route is learned.	extensive
Reference (NhRef)	Number of routes that refer to this next hop.	detail extensive none
Next-hop interface (Netif)	Interface used to reach the next hop.	detail extensive none
Weight	Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible (see the Balance field description).	extensive
Balance	Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a router is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.	extensive
RPF interface	List of interfaces from which the prefix can be accepted. Reverse path forwarding (RPF) information is displayed only when rpf-check is configured on the interface.	extensive

Sample Output

show route forwarding-table

```

user@host> show route forwarding-table
Routing table: default.inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0
0.0.0.0/32       perm  0
172.16.1.0/24    ifdn  0
172.16.1.0/32    iddn  0 172.16.1.0      rcv  606 1 ge-2/0/1.0
172.16.1.1/32    user  0
172.16.1.1/32    intf  0 172.16.1.1      locl 607 2
172.16.1.1/32    iddn  0 172.16.1.1      locl 607 2
172.16.1.255/32 iddn  0 ff:ff:ff:ff:ff:ff bcst 605 1 ge-2/0/1.0
10.0.0.0/24      intf  0
10.0.0.0/32      dest  0 10.0.0.0         rcv  614 1 ge-2/0/0.0
10.0.0.1/32      intf  0 10.0.0.1         locl 615 2
10.0.0.1/32      dest  0 10.0.0.1         locl 615 2
10.0.0.255/32    dest  0 10.0.0.255       bcst 613 1 ge-2/0/0.0
10.1.1.0/24      ifdn  0
10.1.1.0/32      iddn  0 10.1.1.0         rcv  610 1 ge-2/0/1.0
10.1.1.1/32      user  0
10.1.1.1/32      intf  0 10.1.1.1         locl 611 2
10.1.1.1/32      iddn  0 10.1.1.1         locl 611 2
10.1.1.255/32    iddn  0 ff:ff:ff:ff:ff:ff bcst 609 1 ge-2/0/1.0
10.209.0.0/16    user  0 10.209.63.254    ucst 419 20 fxp0.0
10.209.0.0/16    user  1 0:12:1e:ca:98:0  ucst 419 20 fxp0.0
10.209.0.0/18    intf  0
10.209.0.0/32    dest  0 10.209.0.0       rcv  416 1 fxp0.0
10.209.2.131/32 intf  0 10.209.2.131     locl 417 2
10.209.2.131/32 dest  0 10.209.2.131     locl 417 2
10.209.17.55/32 dest  0 0:30:48:5b:78:d2 ucst 435 1 fxp0.0
10.209.63.42/32 dest  0 0:23:7d:58:92:ca ucst 434 1 fxp0.0
10.209.63.254/32 dest  0 0:12:1e:ca:98:0  ucst 419 20 fxp0.0
10.209.63.255/32 dest  0 10.209.63.255    bcst 415 1 fxp0.0
10.227.0.0/16    user  0 10.209.63.254    ucst 419 20 fxp0.0

...

Routing table: iso
ISO:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0
47.0005.80ff.f800.0000.0108.0003.0102.5524.5220.00
intf  0          locl  28  1

Routing table: inet6
Internet6:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0
ff00::/8         perm  0
ff02::1/128      perm  0 ff02::1          mcst  3  1

Routing table: ccc
MPLS:
Interface.Label  Type RtRef Next hop          Type Index NhRef Netif
default          perm  0
100004(top)fe-0/0/1.0

```

show route forwarding-table detail

```

user@host> show route forwarding-table detail
Routing table: inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          user   2 0:90:69:8e:b1:1b ucst  132   4 fxp0.0
default          perm   0                               rjct   14    1
10.1.1.0/24      intf   0 ff.3.0.21         ucst  322   1 so-5/3/0.0
10.1.1.0/32      dest   0 10.1.1.0          recv  324   1 so-5/3/0.0
10.1.1.1/32      intf   0 10.1.1.1          locl  321    1
10.1.1.255/32    dest   0 10.1.1.255        bcst  323   1 so-5/3/0.0
10.21.21.0/24    intf   0 ff.3.0.21         ucst  326   1 so-5/3/0.0
10.21.21.0/32    dest   0 10.21.21.0        recv  328   1 so-5/3/0.0
10.21.21.1/32    intf   0 10.21.21.1        locl  325    1
10.21.21.255/32  dest   0 10.21.21.255      bcst  327   1 so-5/3/0.0
127.0.0.1/32     intf   0 127.0.0.1         locl  320    1
172.17.28.19/32  clon   1 192.168.4.254     ucst  132   4 fxp0.0
172.17.28.44/32  clon   1 192.168.4.254     ucst  132   4 fxp0.0

...

Routing table: private1__inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   46    1
10.0.0.0/8       intf   0                               rslv  136   1 fxp1.0
10.0.0.0/32      dest   0 10.0.0.0          recv  134   1 fxp1.0
10.0.0.4/32      intf   0 10.0.0.4          locl  135    2
10.0.0.4/32      dest   0 10.0.0.4          locl  135    2

...

Routing table: iso
ISO:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   38    1

Routing table: inet6
Internet6:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   22    1
ff00::/8         perm   0                               mdsc   21    1
ff02::1/128      perm   0 ff02::1          mcst   17    1

...

Routing table: mpls
MPLS:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct  28    1

```

show route forwarding-table destination extensive (Weights and Balances)

```

user@host> show route forwarding-table destination 3.4.2.1 extensive
Routing table: inet [Index 0]
Internet:

Destination: 3.4.2.1/32
Route type: user

```


Route reference: 0	Route interface-index: 0
Flags: sent to PFE	
Next-hop type: unicast	Index: 262143 Reference: 1
Nexthop: 172.16.4.4	
Next-hop type: unicast	Index: 335 Reference: 2
Next-hop interface: so-1/1/0.0	Weight: 22 Balance: 3
Nexthop: 145.12.1.2	
Next-hop type: unicast	Index: 337 Reference: 2
Next-hop interface: so-0/1/2.0	Weight: 33 Balance: 33

show route forwarding-table extensive

```

user@host> show route forwarding-table extensive
Routing table: inet [Index 0]
Internet:

Destination: default
  Route type: user
  Route reference: 2
  Flags: sent to PFE
  Nexthop: 00:00:5E:00:53:1b
  Next-hop type: unicast
  Next-hop interface: fxp0.0
  Route interface-index: 0
  Index: 132    Reference: 4

Destination: default
  Route type: permanent
  Route reference: 0
  Flags: none
  Next-hop type: reject
  Route interface-index: 0
  Index: 14    Reference: 1

Destination: 127.0.0.1/32
  Route type: interface
  Route reference: 0
  Flags: sent to PFE
  Nexthop: 127.0.0.1
  Next-hop type: local
  Route interface-index: 0
  Index: 320    Reference: 1

...

Routing table: private1__inet [Index 1]
Internet:

Destination: default
  Route type: permanent
  Route reference: 0
  Flags: sent to PFE
  Next-hop type: reject
  Route interface-index: 0
  Index: 46    Reference: 1

Destination: 10.0.0.0/8
  Route type: interface
  Route reference: 0
  Flags: sent to PFE
  Next-hop type: resolve
  Next-hop interface: fxp1.0
  Route interface-index: 3
  Index: 136    Reference: 1

...

Routing table: iso [Index 0]
ISO:

Destination: default

```

```

Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 38      Reference: 1

Routing table: inet6 [Index 0]
Internet6:

Destination: default
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 22      Reference: 1

Destination: ff00::/8
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: multicast discard
Route interface-index: 0
Index: 21      Reference: 1

...

Routing table: private1__inet6 [Index 1]
Internet6:

Destination: default
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 54      Reference: 1

Destination: fe80::2a0:a5ff:fe3d:375/128
Route type: interface
Route reference: 0
Flags: sent to PFE
Next-hop: fe80::2a0:a5ff:fe3d:375
Next-hop type: local
Route interface-index: 0
Index: 75      Reference: 1

...

```

show route forwarding-table extensive (RPF)

The next example is based on the following configuration, which enables an RPF check on all routes that are learned from this interface, including the interface route:

```

so-1/1/0 {
  unit 0 {
    family inet {
      rpf-check;
      address 192.0.2.2/30;
    }
  }
}

user@host> show route forwarding-table extensive
Routing table: inet [Index 0]
Internet:
...
...
Destination: 192.0.2.3/32

```

```

Route type: destination
Route reference: 0
Flags: sent to PFE
Nexthop: 192.0.2.3
Next-hop type: broadcast
Next-hop interface: so-1/1/0.0
RPF interface: so-1/1/0.0
Route interface-index: 67
Index: 328      Reference: 1

```

show route forwarding-table (dynamic list next hop)

The **show route forwarding table** output shows the two next hop elements for a multihomed EVPN destination.

```

user@host> show route forwarding-table label 299952 extensive
MPLS:

Destination: 299952
Route type: user
Route reference: 0
Multicast RPF nh index: 0
P2mpidx: 0
Flags: sent to PFE, rt nh decoupled
Next-hop type: indirect
Nexthop:
Next-hop type: composite
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301632, Push 299776(top) Index: 600 Reference: 2
Load Balance Label: None
Next-hop interface: ge-0/0/1.0
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301344, Push 299792(top) Index: 619 Reference: 2
Load Balance Label: None
Next-hop interface: ge-0/0/1.0
Route interface-index: 0
Index: 1048575 Reference: 2
Index: 601      Reference: 2
Index: 1048574 Reference: 3
Index: 1048577 Reference: 3
Index: 619 Reference: 2

```

After one of the PE router has been disabled in the EVPN multihomed network, the same **show route forwarding table** output command shows one next hop element and one empty next hop element.

```

user@host> show route forwarding-table label 299952 extensive
Routing table: default.mpls [Index 0]
MPLS:

Destination: 299952
Route type: user
Route reference: 0
Multicast RPF nh index: 0
P2mpidx: 0
Flags: sent to PFE, rt nh decoupled
Next-hop type: indirect
Nexthop:
Next-hop type: composite
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301344, Push 299792(top) Index: 619 Reference: 2
Load Balance Label: None
Next-hop interface: ge-0/0/1.0
Route interface-index: 0
Index: 1048575 Reference: 2
Index: 601      Reference: 2
Index: 1048577 Reference: 3
Index: 619 Reference: 2

```

show route forwarding-table family mpls

```

user@host> show route forwarding-table family mpls
Routing table: mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm  0              rjct   19    1
0                user  0              recv   18    3
1                user  0              recv   18    3
2                user  0              recv   18    3
100000           user  0 10.31.1.6      swap  100001 fe-1/1/0.0
800002           user  0              Pop                                vt-0/3/0.32770

vt-0/3/0.32770 (VPLS)
                  user  0              indr   351    4
                  Push 800000, Push 100002(top)

so-0/0/0.0

```

show route forwarding-table family mpls ccc ge-0/0/1.1004

```

user@host> show route forwarding-table mpls ccc ge-0/0/1.1004
Routing table: default.mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
ge-0/0/1.1004    (CCC) user  0              ulst   1048577 2
                  comp      754    3
                  comp      755    3
                  comp      756    3

Routing table: __mpls-oam__.mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm  0              dscd   556    1

```

show route forwarding-table family vpls

```

user@host> show route forwarding-table family vpls
Routing table: green.vpls
VPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          dnm  0              flood  353    1
default          perm  0              rjct   298    1
fe-0/1/0.0       dnm  0              flood  355    1
00:00:5E:00:53:1f/48 <<<<<Remote CE
                  dnm  0              indr   351    4
                  Push 800000, Push 100002(top)

so-0/0/0.0
00:00:5E:00:53:1f/48 <<<<<Local CE
                  dnm  0              ucst   354    2 fe-0/1/0.0

```

show route forwarding-table vpls (Broadcast, unknown unicast, and multicast (BUM) hashing is enabled)

```

user@host> show route forwarding-table vpls
Routing table: green.vpls
VPLS:
Enabled protocols: BUM hashing
Destination      Type RtRef Next hop      Type Index NhRef Netif

```

```

default          perm    0          dscd      519      1
lsi.1048832      intf    0          indr     1048574  4
                  172.16.3.2      Push 262145    621      2

ge-3/0/0.0
00:00:5E:00:53:01/48 user    0          ucst      590      5 ge-2/3/9.0
0x30003/51       user    0          comp      627      2
ge-2/3/9.0       intf    0          ucst      590      5 ge-2/3/9.0
ge-3/1/3.0       intf    0          ucst      619      4 ge-3/1/3.0
0x30002/51       user    0          comp      600      2
0x30001/51       user    0          comp      597      2

```

show route forwarding-table vpls (Broadcast, unknown unicast, and multicast (BUM) hashing is enabled with MAC Statistics)

```

user@host> show route forwarding-table vpls
Routing table: green.vpls
VPLS:
Enabled protocols: BUM hashing, MAC Stats
Destination      Type RtRef Next hop      Type Index  NhRef Netif
default          perm    0          dscd      519      1
lsi.1048834      intf    0          indr     1048574  4
                  172.16.3.2      Push 262145    592      2

ge-3/0/0.0
00:19:e2:25:d0:01/48 user    0          ucst      590      5 ge-2/3/9.0
0x30003/51       user    0          comp      630      2
ge-2/3/9.0       intf    0          ucst      590      5 ge-2/3/9.0
ge-3/1/3.0       intf    0          ucst      591      4 ge-3/1/3.0
0x30002/51       user    0          comp      627      2
0x30001/51       user    0          comp      624      2

```

show route forwarding-table family vpls extensive

```

user@host> show route forwarding-table family vpls extensive
Routing table: green.vpls [Index 2]
VPLS:

Destination: default
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: unicast
Next-hop interface: fe-0/1/3.0
Next-hop type: unicast
Next-hop interface: fe-0/1/2.0
Route interface-index: 72
Index: 289      Reference: 1
Index: 291      Reference: 3
Index: 290      Reference: 3

Destination: default
Route type: permanent
Route reference: 0
Flags: none
Next-hop type: discard
Route interface-index: 0
Index: 341      Reference: 1

Destination: fe-0/1/2.0
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: indirect
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Route interface-index: 69
Index: 293      Reference: 1
Index: 363      Reference: 4

```

```

Next-hop type: indirect          Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast          Index: 291      Reference: 3
Next-hop interface: fe-0/1/3.0

Destination: fe-0/1/3.0
Route type: dynamic
Route reference: 0              Route interface-index: 70
Flags: sent to PFE
Next-hop type: flood            Index: 292      Reference: 1
Next-hop type: indirect         Index: 363      Reference: 4
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Next-hop type: indirect         Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast          Index: 290      Reference: 3
Next-hop interface: fe-0/1/2.0

Destination: 00:00:5E:00:53:01/48
Route type: dynamic
Route reference: 0              Route interface-index: 70
Flags: sent to PFE, prefix load balance
Next-hop type: unicast          Index: 291      Reference: 3
Next-hop interface: fe-0/1/3.0
Route used as destination:
  Packet count:      6640    Byte count:      675786
Route used as source:
  Packet count:      6894    Byte count:      696424

Destination: 00:00:5E:00:53:04/48
Route type: dynamic
Route reference: 0              Route interface-index: 69
Flags: sent to PFE, prefix load balance
Next-hop type: unicast          Index: 290      Reference: 3
Next-hop interface: fe-0/1/2.0
Route used as destination:
  Packet count:      96      Byte count:      8079
Route used as source:
  Packet count:      296      Byte count:      24955

Destination: 00:00:5E:00:53:05/48
Route type: dynamic
Route reference: 0              Route interface-index: 74
Flags: sent to PFE, prefix load balance
Next-hop type: indirect         Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0

```

show route forwarding-table table default

```

user@host> show route forwarding-table table default
Routing table: default.inet
Internet:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm  0
0.0.0.0/32       perm  0                dscd   34    1

```

```

10.0.60.0/30      user    0 10.0.60.13      ucst   713    5 fe-0/1/3.0
10.0.60.12/30     intf    0                rslv   688    1 fe-0/1/3.0
10.0.60.12/32     dest    0 10.0.60.12      recv   686    1 fe-0/1/3.0
10.0.60.13/32     dest    0 0:5:85:8b:bc:22 ucst   713    5 fe-0/1/3.0
10.0.60.14/32     intf    0 10.0.60.14      locl   687    2
10.0.60.14/32     dest    0 10.0.60.14      locl   687    2
10.0.60.15/32     dest    0 10.0.60.15      bcst   685    1 fe-0/1/3.0
10.0.67.12/30     user    0 10.0.60.13      ucst   713    5 fe-0/1/3.0
10.0.80.0/30      ifdn    0 ff.3.0.21       ucst   676    1 so-0/0/1.0
10.0.80.0/32      dest    0 10.0.80.0       recv   678    1 so-0/0/1.0
10.0.80.2/32      user    0                rjct   36     2
10.0.80.2/32      intf    0 10.0.80.2       locl   675    1
10.0.80.3/32      dest    0 10.0.80.3       bcst   677    1 so-0/0/1.0
10.0.90.12/30     intf    0                rslv   684    1 fe-0/1/0.0
10.0.90.12/32     dest    0 10.0.90.12      recv   682    1 fe-0/1/0.0
10.0.90.14/32     intf    0 10.0.90.14      locl   683    2
10.0.90.14/32     dest    0 10.0.90.14      locl   683    2
10.0.90.15/32     dest    0 10.0.90.15      bcst   681    1 fe-0/1/0.0
10.5.0.0/16       user    0 192.168.187.126 ucst   324    15 fxp0.0
10.10.0.0/16      user    0 192.168.187.126 ucst   324    15 fxp0.0
10.13.10.0/23     user    0 192.168.187.126 ucst   324    15 fxp0.0
10.84.0.0/16      user    0 192.168.187.126 ucst   324    15 fxp0.0
10.150.0.0/16     user    0 192.168.187.126 ucst   324    15 fxp0.0
10.157.64.0/19   user    0 192.168.187.126 ucst   324    15 fxp0.0
10.209.0.0/16     user    0 192.168.187.126 ucst   324    15 fxp0.0

```

...

Routing table: default.iso

ISO:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	60	1	

Routing table: default.inet6

Internet6:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	44	1	
::/128	perm	0		dscd	42	1	
ff00::/8	perm	0		mdsc	43	1	
ff02::1/128	perm	0	ff02::1	mcst	39	1	

Routing table: default.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		dscd	50	1	

show route forwarding-table table logical-system-name/routing-instance-name

```
user@host> show route forwarding-table table R4/vpn-red
```

Logical system: R4

Routing table: vpn-red.inet

Internet:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	563	1	
0.0.0.0/32	perm	0		dscd	561	2	
172.16.0.1/32	user	0		dscd	561	2	
172.16.2.0/24	intf	0		rslv	771	1	ge-1/2/0.3
172.16.2.0/32	dest	0	172.16.2.0	recv	769	1	ge-1/2/0.3
172.16.2.1/32	intf	0	172.16.2.1	locl	770	2	
172.16.2.1/32	dest	0	172.16.2.1	locl	770	2	
172.16.2.2/32	dest	0	0.4.80.3.0.1b.c0.d5.e4.bd.0.1b.c0.d5.e4.bc.8.0				

```

172.16.2.255/32    dest    0 172.16.2.255    ucst    789    1 ge-1/2/0.3
172.16.233.0/4     perm    1                bcst    768    1 ge-1/2/0.3
172.16.233.1/32    perm    0 172.16.233.1    mdsc    562    1
255.255.255.255/32 perm    0                mcst    558    1
                                bcst    559    1

```

Logical system: R4

Routing table: vpn-red.iso

ISO:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	608	1	

Logical system: R4

Routing table: vpn-red.inet6

Internet6:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	708	1	
::/128	perm	0		dscd	706	1	
ff00::/8	perm	0		mdsc	707	1	
ff02::1/128	perm	0	ff02::1	mcst	704	1	

Logical system: R4

Routing table: vpn-red.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		dscd	638		

show route forwarding-table vpn

```
user@host> show route forwarding-table vpn VPN-A
```

Routing table:: VPN-A.inet

Internet:

Destination	Type	RtRef	Nexthop	Type	Index	NhRef	Netif
default	perm	0		rjct	4	4	
10.39.10.20/30	intf	0	ff.3.0.21	ucst	40	1	
so-0/0/0.0							
10.39.10.21/32	intf	0	10.39.10.21	loc1	36	1	
10.255.14.172/32	user	0		ucst	69	2	
so-0/0/0.0							
10.255.14.175/32	user	0		indr	81	3	
				Push	100004	Push	
100004(top) so-1/0/0.0							
172.16.233.0/4	perm	2		mdsc	5	3	
172.16.233.1/32	perm	0	172.16.233.1	mcst	1	8	
172.16.233.5/32	user	1	172.16.233.5	mcst	1	8	
255.255.255.255/32	perm	0		bcst	2	3	

On QFX5200, the results for this command look like this:

```
show route forwarding-table family mpls
```

Routing table: default.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0	dscd	65	1		
0	user	0	recv	64	4		
1	user	0	recv	64	4		
2	user	0	recv	64	4		
13	user	0	recv	64	4		
300384	user	0	9.1.1.1 Pop	1711	2	xe-0/0/34.0	
300384(S=0)	user	0	9.1.1.1 Pop	1712	2	xe-0/0/34.0	


```
300400 user 0 ulst 131071 2
                                10.1.1.2 Pop 1713 1 xe-0/0/38.0
                                172.16.11.2 Pop 1714 1 xe-0/0/40.0
300400(S=0) user 0 ulst 131072 2
                                10.1.1.2 Pop 1715 1 xe-0/0/38.0
                                172.16.11.2 Pop 1716 1 xe-0/0/40.0
```

Routing table: __mpls-oam__.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0	dscd	1681	1		

show route hidden

Syntax	<code>show route hidden</code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display only hidden route information. A hidden route is unusable, even if it is the best path.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• <i>Understanding Hidden Routes</i>
List of Sample Output	show route hidden on page 374 show route hidden detail on page 375 show route hidden extensive on page 375 show route hidden terse on page 375
Output Fields	For information about output fields, see the output field table for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route hidden

```
user@host> show route hidden
inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
127.0.0.1/32      [Direct/0] 04:26:38
                  > via lo0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.5.5.5/32      [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: 100 I
```

```

10.12.1.0/24      Unusable
                  [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: 100 I
10.12.80.4/30    Unusable
                  [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: I
...              Unusable

```

show route hidden detail

```

user@host> show route hidden detail

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
127.0.0.1/32 (1 entry, 0 announced)
  Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 1
    Next hop: via lo0.0, selected
    State: <Hidden Martian Int>
    Local AS:      1
    Age: 4:27:37
    Task: IF
    AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete

10.5.5.5/32 (1 entry, 0 announced)
  BGP Preference: 170/-101
    Route Distinguisher: 10.4.4.4:4
    Next hop type: Unusable
    Next-hop reference count: 6
    State: <Secondary Hidden Int Ext>
    Local AS:      1 Peer AS:      1
    Age: 3:45:09
    Task: BGP_1.10.4.4.4+2493
    AS path: 100 I
    Communities: target:1:999
    VPN Label: 100064
    Localpref: 100
    Router ID: 10.4.4.4
    Primary Routing Table bgp.13vpn.0
...

```

show route hidden extensive

The output for the **show route hidden extensive** command is identical to that of the **show route hidden detail** command. For sample output, see [show route hidden detail on page 375](#).

show route hidden terse

```
user@host> show route hidden terse
```

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)

Restart Complete

+ = Active Route, - = Last Active, * = Both

A Destination	P Prf	Metric 1	Metric 2	Next hop	AS path
127.0.0.1/32	D 0			>1o0.0	

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)

Restart Complete

+ = Active Route, - = Last Active, * = Both

A Destination	P Prf	Metric 1	Metric 2	Next hop	AS path
10.5.5.5/32	B 170	100		Unusable	100 I
10.12.1.0/24	B 170	100		Unusable	100 I
10.12.80.4/30	B 170	100		Unusable	I

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

Restart Complete

bgp.l3vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)

Restart Complete

+ = Active Route, - = Last Active, * = Both

A Destination	P Prf	Metric 1	Metric 2	Next hop	AS path
10.4.4.4:4:10.5.5.5/32	B 170	100		Unusable	100 I
10.4.4.4:4:10.12.1.0/24	B 170	100		Unusable	100 I
10.4.4.4:4:10.12.80.4/30	B 170	100		Unusable	I

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

show route inactive-path

List of Syntax	Syntax on page 377 Syntax (EX Series Switches) on page 377
Syntax	<pre>show route inactive-path <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches)	<pre>show route inactive-path <brief detail extensive terse></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display routes for destinations that have no active route. An inactive route is a route that was not selected as the best path.</p>
Options	<p>none—Display all inactive routes.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show route active-path on page 295
List of Sample Output	show route inactive-path on page 377 show route inactive-path detail on page 378 show route inactive-path extensive on page 379 show route inactive-path terse on page 379
Output Fields	<p>For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.</p>

Sample Output

show route inactive-path

```
user@host> show route inactive-path

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
```

```

Restart Complete
+ = Active Route, - = Last Active, * = Both

10.12.100.12/30      [OSPF/10] 03:57:28, metric 1
                    > via so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.0/8          [Direct/0] 04:39:56
                    > via fxp1.0

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

10.12.80.0/30       [BGP/170] 04:38:17, localpref 100
                    AS path: 100 I
                    > to 10.12.80.1 via ge-6/3/2.0

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

bgp.l3vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route inactive-path detail

```

user@host> show route inactive-path detail

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete

10.12.100.12/30 (2 entries, 1 announced)
  OSPF   Preference: 10
        Next-hop reference count: 1
        Next hop: via so-0/3/0.0, selected
        State: <Int>
        Inactive reason: Route Preference
        Local AS:      1
        Age: 3:58:24   Metric: 1
        Area: 0.0.0.0
        Task: OSPF
        AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

10.0.0.0/8 (2 entries, 0 announced)
  Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via fxp1.0, selected
        State: <NotBest Int>

```

```

Inactive reason: No difference
Age: 4:40:52
Task: IF
AS path: I

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete

10.12.80.0/30 (2 entries, 1 announced)
  BGP    Preference: 170/-101
        Next-hop reference count: 6
        Source: 10.12.80.1
        Next hop: 10.12.80.1 via ge-6/3/2.0, selected
        State: <Ext>
        Inactive reason: Route Preference
        Peer AS: 100
        Age: 4:39:13
        Task: BGP_100.10.12.80.1+179
        AS path: 100 I
        Localpref: 100
        Router ID: 10.0.0.0

```

show route inactive-path extensive

The output for the **show route inactive-path extensive** command is identical to that of the **show route inactive-path detail** command. For sample output, see [show route inactive-path detail on page 378](#).

show route inactive-path terse

```

user@host> show route inactive-path terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
  10.12.100.12/30   0 10           1           >so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
  10.0.0.0/8        D  0           0           >fxp1.0

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
  10.12.80.0/30     B 170          100          >10.12.80.1    100 I

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

```

bgp.13vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

show route instance

List of Syntax	Syntax on page 381 Syntax (EX Series Switches and QFX Series) on page 381
Syntax	<pre>show route instance <brief detail summary> <instance-name> <logical-system (all logical-system-name)> <operational></pre>
Syntax (EX Series Switches and QFX Series)	<pre>show route instance <brief detail summary> <instance-name> <operational></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display routing instance information.
Options	<p>none—(Same as brief) Display standard information about all routing instances.</p> <p>brief detail summary—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief. (These options are not available with the operational keyword.)</p> <p>instance-name—(Optional) Display information for all routing instances whose name begins with this string (for example, cust1, cust11, and cust111 are all displayed when you run the show route instance cust1 command).</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>operational—(Optional) Display operational routing instances.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Transporting IPv6 Traffic Across IPv4 Using Filter-Based Tunneling</i> • <i>Example: Configuring the Helper Capability Mode for OSPFv3 Graceful Restart</i>
List of Sample Output	show route instance on page 383 show route instance detail (Graceful Restart Complete) on page 383 show route instance detail (Graceful Restart Incomplete) on page 385

[show route instance detail \(VPLS Routing Instance\) on page 387](#)

[show route instance operational on page 387](#)

[show route instance summary on page 387](#)

Output Fields Table 26 on page 382 lists the output fields for the **show route instance** command. Output fields are listed in the approximate order in which they appear.

Table 26: show route instance Output Fields

Field Name	Field Description	Level of Output
Instance or <i>instance-name</i>	Name of the routing instance.	All levels
Operational Routing Instances	(operational keyword only) Names of all operational routing instances.	—
Type	Type of routing instance: forwarding , l2vpn , no-forwarding , vpls , virtual-router , or vrf .	All levels
State	State of the routing instance: active or inactive .	brief detail none
Interfaces	Name of interfaces belonging to this routing instance.	brief detail none
Restart State	Status of graceful restart for this instance: Pending or Complete .	detail
Path selection timeout	Maximum amount of time, in seconds, remaining until graceful restart is declared complete. The default is 300 .	detail
Tables	Tables (and number of routes) associated with this routing instance.	brief detail none
Route-distinguisher	Unique route distinguisher associated with this routing instance.	detail
Vrf-import	VPN routing and forwarding instance import policy name.	detail
Vrf-export	VPN routing and forwarding instance export policy name.	detail
Vrf-import-target	VPN routing and forwarding instance import target community name.	detail
Vrf-export-target	VPN routing and forwarding instance export target community name.	detail
Vrf-edge-protection-id	Context identifier configured for edge-protection.	detail
Fast-reroute-priority	Fast reroute priority setting for a VPLS routing instance: high , medium , or low . The default is low .	detail
Restart State	Restart state: <ul style="list-style-type: none"> Pending:protocol-name—List of protocols that have not yet completed graceful restart for this routing table. Complete—All protocols have restarted for this routing table. 	detail

Table 26: show route instance Output Fields (*continued*)

Field Name	Field Description	Level of Output
Primary rib	Primary table for this routing instance.	brief none summary
Active/holddown/hidden	Number of active, hold-down, and hidden routes.	All levels

Sample Output

show route instance

```

user@host> show route instance
Instance          Type
Primary RIB
master            forwarding
inet.0            16/0/1
iso.0             1/0/0
mpls.0            0/0/0
inet6.0           2/0/0
l2circuit.0      0/0/0
__juniper_private1__ forwarding
__juniper_private1__.inet.0 12/0/0
__juniper_private1__.inet6.0 1/0/0

```

show route instance detail (Graceful Restart Complete)

```

user@host> show route instance detail
master:
Router ID: 10.255.14.176
Type: forwarding      State: Active
Restart State: Complete Path selection timeout: 300
Tables:
inet.0                : 17 routes (15 active, 0 holddown, 1 hidden)
Restart Complete
inet.3                : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
iso.0                 : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete
mpls.0                : 19 routes (19 active, 0 holddown, 0 hidden)
Restart Complete
bgp.l3vpn.0           : 10 routes (10 active, 0 holddown, 0 hidden)
Restart Complete
inet6.0               : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
bgp.l2vpn.0           : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete
BGP-INET:
Router ID: 10.69.103.1
Type: vrf              State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
t3-0/0/0.103
Route-distinguisher: 10.255.14.176:103
Vrf-import: [ BGP-INET-import ]
Vrf-export: [ BGP-INET-export ]
Tables:
BGP-INET.inet.0       : 4 routes (4 active, 0 holddown, 0 hidden)

```

```
Restart Complete
BGP-L:
Router ID: 10.69.104.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.104
Route-distinguisher: 10.255.14.176:104
Vrf-import: [ BGP-L-import ]
Vrf-export: [ BGP-L-export ]
Tables:
  BGP-L.inet.0                  : 4 routes (4 active, 0 holddown, 0 hidden)
  Restart Complete
  BGP-L.mpls.0                  : 3 routes (3 active, 0 holddown, 0 hidden)
  Restart Complete
L2VPN:
Router ID: 0.0.0.0
Type: l2vpn                    State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.512
Route-distinguisher: 10.255.14.176:512
Vrf-import: [ L2VPN-import ]
Vrf-export: [ L2VPN-export ]
Tables:
  L2VPN.l2vpn.0                 : 2 routes (2 active, 0 holddown, 0 hidden)
  Restart Complete
LDP:
Router ID: 10.69.105.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.105
Route-distinguisher: 10.255.14.176:105
Vrf-import: [ LDP-import ]
Vrf-export: [ LDP-export ]
Tables:
  LDP.inet.0                    : 5 routes (4 active, 0 holddown, 0 hidden)
  Restart Complete
OSPF:
Router ID: 10.69.101.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.101
Route-distinguisher: 10.255.14.176:101
Vrf-import: [ OSPF-import ]
Vrf-export: [ OSPF-export ]
Vrf-import-target: [ target:11111
Tables:
  OSPF.inet.0                   : 8 routes (7 active, 0 holddown, 0 hidden)
  Restart Complete
RIP:
Router ID: 10.69.102.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.102
Route-distinguisher: 10.255.14.176:102
Vrf-import: [ RIP-import ]
Vrf-export: [ RIP-export ]
```

```

Tables:
  RIP.inet.0          : 6 routes (6 active, 0 holddown, 0 hidden)
  Restart Complete
STATIC:
  Router ID: 10.69.100.1
  Type: vrf           State: Active
  Restart State: Complete Path selection timeout: 300
  Interfaces:
    t3-0/0/0.100
  Route-distinguisher: 10.255.14.176:100
  Vrf-import: [ STATIC-import ]
  Vrf-export: [ STATIC-export ]
  Tables:
    STATIC.inet.0      : 4 routes (4 active, 0 holddown, 0 hidden)
    Restart Complete

```

show route instance detail (Graceful Restart Incomplete)

```

user@host> show route instance detail
master:
  Router ID: 10.255.14.176
  Type: forwarding      State: Active
  Restart State: Pending Path selection timeout: 300
  Tables:
    inet.0              : 17 routes (15 active, 1 holddown, 1 hidden)
    Restart Pending: OSPF LDP
    inet.3              : 2 routes (2 active, 0 holddown, 0 hidden)
    Restart Pending: OSPF LDP
    iso.0               : 1 routes (1 active, 0 holddown, 0 hidden)
    Restart Complete
    mpls.0              : 23 routes (23 active, 0 holddown, 0 hidden)
    Restart Pending: LDP VPN
    bgp.l3vpn.0         : 10 routes (10 active, 0 holddown, 0 hidden)
    Restart Pending: BGP VPN
    inet6.0             : 2 routes (2 active, 0 holddown, 0 hidden)
    Restart Complete
    bgp.l2vpn.0         : 1 routes (1 active, 0 holddown, 0 hidden)
    Restart Pending: BGP VPN
  BGP-INET:
    Router ID: 10.69.103.1
    Type: vrf           State: Active
    Restart State: Pending Path selection timeout: 300
    Interfaces:
      t3-0/0/0.103
    Route-distinguisher: 10.255.14.176:103
    Vrf-import: [ BGP-INET-import ]
    Vrf-export: [ BGP-INET-export ]
    Tables:
      BGP-INET.inet.0   : 6 routes (5 active, 0 holddown, 0 hidden)
      Restart Pending: VPN
  BGP-L:
    Router ID: 10.69.104.1
    Type: vrf           State: Active
    Restart State: Pending Path selection timeout: 300
    Interfaces:
      t3-0/0/0.104
    Route-distinguisher: 10.255.14.176:104
    Vrf-import: [ BGP-L-import ]
    Vrf-export: [ BGP-L-export ]
    Tables:
      BGP-L.inet.0      : 6 routes (5 active, 0 holddown, 0 hidden)

```

```
Restart Pending: VPN
BGP-L.mpls.0      : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Pending: VPN
L2VPN:
Router ID: 0.0.0.0
Type: l2vpn      State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.512
Route-distinguisher: 10.255.14.176:512
Vrf-import: [ L2VPN-import ]
Vrf-export: [ L2VPN-export ]
Tables:
  L2VPN.l2vpn.0      : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Pending: VPN L2VPN
LDP:
Router ID: 10.69.105.1
Type: vrf      State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.105
Route-distinguisher: 10.255.14.176:105
Vrf-import: [ LDP-import ]
Vrf-export: [ LDP-export ]
Tables:
  LDP.inet.0      : 5 routes (4 active, 1 holddown, 0 hidden)
Restart Pending: OSPF LDP VPN
OSPF:
Router ID: 10.69.101.1
Type: vrf      State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.101
Route-distinguisher: 10.255.14.176:101
Vrf-import: [ OSPF-import ]
Vrf-export: [ OSPF-export ]
Tables:
  OSPF.inet.0      : 8 routes (7 active, 1 holddown, 0 hidden)
Restart Pending: OSPF VPN
RIP:
Router ID: 10.69.102.1
Type: vrf      State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.102
Route-distinguisher: 10.255.14.176:102
Vrf-import: [ RIP-import ]
Vrf-export: [ RIP-export ]
Tables:
  RIP.inet.0      : 8 routes (6 active, 2 holddown, 0 hidden)
Restart Pending: RIP VPN
STATIC:
Router ID: 10.69.100.1
Type: vrf      State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.100
Route-distinguisher: 10.255.14.176:100
Vrf-import: [ STATIC-import ]
Vrf-export: [ STATIC-export ]
Tables:
```

```

STATIC.inet.0          : 4 routes (4 active, 0 holddown, 0 hidden)
Restart Pending: VPN

```

show route instance detail (VPLS Routing Instance)

```

user@host> show route instance detail test-vpls
test-vpls:
  Router ID: 0.0.0.0
  Type: vpls          State: Active
  Interfaces:
    lsi.1048833
    lsi.1048832
    fe-0/1/0.513
  Route-distinguisher: 10.255.37.65:1
  Vrf-import: [ __vrf-import-test-vpls-internal__ ]
  Vrf-export: [ __vrf-export-test-vpls-internal__ ]
  Vrf-import-target: [ target:300:1 ]
  Vrf-export-target: [ target:300:1 ]
  Vrf-edge-protection-id: 166.1.3.1 Fast-reroute-priority: high
  Tables:
    test-vpls.l2vpn.0          : 3 routes (3 active, 0 holddown, 0 hidden)

```

show route instance operational

```

user@host> show route instance operational
Operational Routing Instances:

master
default

```

show route instance summary

```

user@host> show route instance summary

```

Instance	Type	Primary rib	Active/holddown/hidden
master	forwarding	inet.0	15/0/1
		iso.0	1/0/0
		mpls.0	35/0/0
		l3vpn.0	0/0/0
		inet6.0	2/0/0
		l2vpn.0	0/0/0
		l2circuit.0	0/0/0
BGP-INET	vrf	BGP-INET.inet.0	5/0/0
		BGP-INET.iso.0	0/0/0
		BGP-INET.inet6.0	0/0/0
BGP-L	vrf	BGP-L.inet.0	5/0/0
		BGP-L.iso.0	0/0/0
		BGP-L.mpls.0	4/0/0
		BGP-L.inet6.0	0/0/0
L2VPN	l2vpn	L2VPN.inet.0	0/0/0
		L2VPN.iso.0	0/0/0
		L2VPN.inet6.0	0/0/0
		L2VPN.l2vpn.0	2/0/0
LDP	vrf	LDP.inet.0	4/0/0
		LDP.iso.0	0/0/0
		LDP.mpls.0	0/0/0

OSPF	vrf	LDP.inet6.0	0/0/0
		LDP.l2circuit.0	0/0/0
		OSPF.inet.0	7/0/0
RIP	vrf	OSPF.iso.0	0/0/0
		OSPF.inet6.0	0/0/0
		RIP.inet.0	6/0/0
STATIC	vrf	RIP.iso.0	0/0/0
		RIP.inet6.0	0/0/0
		STATIC.inet.0	4/0/0
		STATIC.iso.0	0/0/0
		STATIC.inet6.0	0/0/0

show route next-hop

List of Syntax	Syntax on page 389 Syntax (EX Series Switches) on page 389
Syntax	show route next-hop <i>next-hop</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switches)	show route next-hop <i>next-hop</i> <brief detail extensive terse>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the entries in the routing table that are being sent to the specified next-hop address.
Options	brief detail extensive terse —(Optional) Display the specified level of output. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>next-hop</i> —Next-hop address.
Required Privilege Level	view
List of Sample Output	show route next-hop on page 389 show route next-hop detail on page 390 show route next-hop extensive on page 392 show route next-hop terse on page 393
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route next-hop

```

user@host> show route next-hop 192.168.71.254

inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

10.10.0.0/16          *[Static/5] 06:26:25
                     > to 192.168.71.254 via fxp0.0
10.209.0.0/16        *[Static/5] 06:26:25

```

```

> to 192.168.71.254 via fxp0.0
172.16.0.0/12    *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
192.168.0.0/16  *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
192.168.102.0/23 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
207.17.136.0/24 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
207.17.136.192/32 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route next-hop detail

```

user@host> show route next-hop 192.168.71.254 detail

inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
Restart Complete
10.10.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

10.209.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

172.16.0.0/12 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>

```

```

Local AS:      1
Age: 6:27:41
Task: RT
Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
AS path: I

192.168.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

192.168.102.0/23 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

207.17.136.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

207.17.136.192/32 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

```

```
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
```

```
private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route next-hop extensive

```
user@host> show route next-hop 192.168.71.254 extensive
```

```
inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
10.10.0.0/16 (1 entry, 1 announced)
```

```
TSI:
```

```
KRT in-kernel 10.10.0.0/16 -> {192.168.71.254}
```

```
  *Static Preference: 5
```

```
    Next-hop reference count: 22
```

```
    Next hop: 192.168.71.254 via fxp0.0, selected
```

```
    State: <Active NoReadvrt Int Ext>
```

```
    Local AS: 69
```

```
    Age: 2:02:28
```

```
    Task: RT
```

```
    Announcement bits (1): 0-KRT
```

```
    AS path: I
```

```
10.209.0.0/16 (1 entry, 1 announced)
```

```
TSI:
```

```
KRT in-kernel 10.209.0.0/16 -> {192.168.71.254}
```

```
  *Static Preference: 5
```

```
    Next-hop reference count: 22
```

```
    Next hop: 192.168.71.254 via fxp0.0, selected
```

```
    State: <Active NoReadvrt Int Ext>
```

```
    Local AS: 69
```

```
    Age: 2:02:28
```

```
    Task: RT
```

```
    Announcement bits (1): 0-KRT
```

```
    AS path: I
```

```
172.16.0.0/12 (1 entry, 1 announced)
```

```
TSI:
```

```
KRT in-kernel 172.16.0.0/12 -> {192.168.71.254}
```

```
  *Static Preference: 5
```

```
    Next-hop reference count: 22
```

```
    Next hop: 192.168.71.254 via fxp0.0, selected
```

```
    State: <Active NoReadvrt Int Ext>
```

```
    Local AS: 69
```

```
    Age: 2:02:28
```

```
    Task: RT
```

```
    Announcement bits (1): 0-KRT
```

```
    AS path: I
```

```
192.168.0.0/16 (1 entry, 1 announced)
```

```
TSI:
```

```
KRT in-kernel 192.168.0.0/16 -> {192.168.71.254}
```

```
  *Static Preference: 5
```

```
    Next-hop reference count: 22
```

```
    Next hop: 192.168.71.254 via fxp0.0, selected
```

```
    State: <Active NoReadvrt Int Ext>
```

```
    Local AS: 69
```

```
    Age: 2:02:28
```

```
    Task: RT
```

```
    Announcement bits (1): 0-KRT
```

```
    AS path: I
```

```

192.168.102.0/23 (1 entry, 1 announced)
TSI:
KRT in-kernel 192.168.102.0/23 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

207.17.136.0/24 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.0/24 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

207.17.136.192/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.192/32 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

green.l2vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

red.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route next-hop terse

```

user@host> show route next-hop 192.168.71.254 terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

```

A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	10.10.0.0/16	S	5			>192.168.71.254	
*	10.209.0.0/16	S	5			>192.168.71.254	
*	172.16.0.0/12	S	5			>192.168.71.254	
*	192.168.0.0/16	S	5			>192.168.71.254	
*	192.168.102.0/23	S	5			>192.168.71.254	
*	207.17.136.0/24	S	5			>192.168.71.254	
*	207.17.136.192/32	S	5			>192.168.71.254	

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

show route output

List of Syntax	Syntax on page 395 Syntax (EX Series Switches) on page 395
Syntax	<pre>show route output (address <i>ip-address</i> interface <i>interface-name</i>) <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches)	<pre>show route output (address <i>ip-address</i> interface <i>interface-name</i>) <brief detail extensive terse></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display the entries in the routing table learned through static routes and interior gateway protocols that are to be sent out the interface with either the specified IP address or specified name.</p> <p>To view routes advertised to a neighbor or received from a neighbor for the BGP protocol, use the show route advertising-protocol bgp and show route receive-protocol bgp commands instead.</p>
Options	<p>address <i>ip-address</i>—Display entries in the routing table that are to be sent out the interface with the specified IP address.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p>interface <i>interface-name</i>—Display entries in the routing table that are to be sent out the interface with the specified name.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route output address on page 396 show route output address detail on page 396 show route output address extensive on page 397 show route output address terse on page 397 show route output interface on page 397 show route output interface detail on page 398 show route output interface extensive on page 398 show route output interface terse on page 398

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

show route output address

```
user@host> show route output address 172.16.36.1/24

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.36.0/24          *[Direct/0] 00:19:56
                        > via so-0/1/2.0
                        [OSPF/10] 00:19:55, metric 1
                        > via so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output address detail

```
user@host> show route output address 172.16.36.1 detail

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
172.16.36.0/24 (2 entries, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via so-0/1/2.0, selected
        State: <Active Int>
        Age: 23:00
        Task: IF
        AS path: I
    OSPF Preference: 10
        Next-hop reference count: 1
        Next hop: via so-0/1/2.0, selected
        State: <Int>
        Inactive reason: Route Preference
        Age: 22:59      Metric: 1
        Area: 0.0.0.0
        Task: OSPF
        AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
```



```
private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output address extensive

The output for the **show route output address extensive** command is identical to that of the **show route output address detail** command. For sample output, see [show route output address detail on page 396](#).

show route output address terse

```
user@host> show route output address 172.16.36.1 terse

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 172.16.36.0/24    D  0           1           >so-0/1/2.0
                      0 10           >so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output interface

```
user@host> show route output interface so-0/1/2.0

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.71.240/32    *[OSPF/10] 00:13:00, metric 2
                   via so-0/1/2.0
                   > via so-0/3/2.0
10.255.71.241/32    *[OSPF/10] 00:13:10, metric 1
                   > via so-0/1/2.0
172.16.14.0/24      *[OSPF/10] 00:05:11, metric 3
                   to 35.1.1.2 via ge-3/1/0.0
                   > via so-0/1/2.0
                   via so-0/3/2.0
172.16.16.0/24      *[OSPF/10] 00:13:10, metric 2
                   > via so-0/1/2.0
172.16.36.0/24      *[Direct/0] 00:13:21
                   > via so-0/1/2.0
                   [OSPF/10] 00:13:20, metric 1
                   > via so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
```

```
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output interface detail

```
user@host> show route output interface so-0/1/2.0 detail

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
10.255.71.240/32 (1 entry, 1 announced)
    *OSPF   Preference: 10
           Next-hop reference count: 2
           Next hop: via so-0/1/2.0
           Next hop: via so-0/3/2.0, selected
           State: <Active Int>
           Age: 14:52      Metric: 2
           Area: 0.0.0.0
           Task: OSPF
           Announcement bits (1): 0-KRT
           AS path: I

10.255.71.241/32 (1 entry, 1 announced)
    *OSPF   Preference: 10
           Next-hop reference count: 4
           Next hop: via so-0/1/2.0, selected
           State: <Active Int>
           Age: 15:02      Metric: 1
           Area: 0.0.0.0
           Task: OSPF
           Announcement bits (1): 0-KRT
           AS path: I

...
```

show route output interface extensive

The output for the **show route output interface extensive** command is identical to that of the **show route output interface detail** command. For sample output, see [show route output interface detail on page 398](#).

show route output interface terse

```
user@host> show route output interface so-0/1/2.0 terse

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* 10.255.71.240/32  0 10      2          so-0/1/2.0
                        >so-0/3/2.0
* 10.255.71.241/32  0 10      1          >so-0/1/2.0
* 172.16.14.0/24    0 10      3          35.1.1.2
                        >so-0/1/2.0
                        so-0/3/2.0
* 172.16.16.0/24    0 10      2          >so-0/1/2.0
* 172.16.36.0/24    D 0       1          >so-0/1/2.0
                        0 10      1          >so-0/1/2.0

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
```

```
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route protocol

List of Syntax	Syntax on page 400 Syntax (EX Series Switches) on page 400
Syntax	<code>show route protocol <i>protocol</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route protocol <i>protocol</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. ospf2 and ospf3 options introduced in Junos OS Release 9.2. ospf2 and ospf3 options introduced in Junos OS Release 9.2 for EX Series switches. flow option introduced in Junos OS Release 10.0. flow option introduced in Junos OS Release 10.0 for EX Series switches.
Description	Display the route entries in the routing table that were learned from a particular protocol.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>protocol</i> —Protocol from which the route was learned: <ul style="list-style-type: none">• access—Access route for use by DHCP application• access-internal—Access-internal route for use by DHCP application• aggregate—Locally generated aggregate route• arp—Route learned through the Address Resolution Protocol• atmvpn—Asynchronous Transfer Mode virtual private network• bgp—Border Gateway Protocol• ccc—Circuit cross-connect• direct—Directly connected route• dvmrp—Distance Vector Multicast Routing Protocol• esis—End System-to-Intermediate System• flow—Locally defined flow-specification route• frr—Precomputed protection route or backup route used when a link goes down• isis—Intermediate System-to-Intermediate System

- **ldp**—Label Distribution Protocol
- **l2circuit**—Layer 2 circuit
- **l2vpn**—Layer 2 virtual private network
- **local**—Local address
- **mpls**—Multiprotocol Label Switching
- **msdp**—Multicast Source Discovery Protocol
- **ospf**—Open Shortest Path First versions 2 and 3
- **ospf2**—Open Shortest Path First versions 2 only
- **ospf3**—Open Shortest Path First version 3 only
- **pim**—Protocol Independent Multicast
- **rip**—Routing Information Protocol
- **ripng**—Routing Information Protocol next generation
- **rsvp**—Resource Reservation Protocol
- **rtarget**—Local route target virtual private network
- **static**—Statically defined route
- **tunnel**—Dynamic tunnel
- **vpn**—Virtual private network



NOTE: EX Series switches run a subset of these protocols. See the switch CLI for details.

Required Privilege Level view

List of Sample Output

- [show route protocol access on page 402](#)
- [show route protocol access-internal extensive on page 402](#)
- [show route protocol arp on page 402](#)
- [show route protocol bgp on page 403](#)
- [show route protocol bgp detail on page 403](#)
- [show route protocol bgp detail \(Labeled Unicast\) on page 404](#)
- [show route protocol bgp detail \(Aggregate Extended Community Bandwidth\) on page 404](#)
- [show route protocol bgp extensive on page 405](#)
- [show route protocol bgp terse on page 406](#)
- [show route protocol direct on page 406](#)
- [show route protocol frr on page 406](#)
- [show route protocol l2circuit detail on page 407](#)

[show route protocol l2vpn extensive on page 408](#)
[show route protocol ldp on page 408](#)
[show route protocol ldp extensive on page 409](#)
[show route protocol ospf \(Layer 3 VPN\) on page 410](#)
[show route protocol ospf detail on page 411](#)
[show route protocol rip on page 411](#)
[show route protocol rip detail on page 411](#)
[show route protocol ripng table inet6 on page 411](#)
[show route protocol static detail on page 412](#)

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

[show route protocol access](#)

```
user@host> show route protocol access
inet.0: 30380 destinations, 30382 routes (30379 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

13.160.0.3/32      *[Access/13] 00:00:09
                  > to 13.160.0.2 via fe-0/0/0.0
13.160.0.4/32      *[Access/13] 00:00:09
                  > to 13.160.0.2 via fe-0/0/0.0
13.160.0.5/32      *[Access/13] 00:00:09
                  > to 13.160.0.2 via fe-0/0/0.0
```

[show route protocol access-internal extensive](#)

```
user@host> show route protocol access-internal 13.160.0.19 extensive
inet.0: 100020 destinations, 100022 routes (100019 active, 0 holddown, 1 hidden)
13.160.0.19/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 13.160.0.19/32 -> {13.160.0.2}
  *Access-internal Preference: 12
    Next-hop reference count: 200000
    Next hop: 13.160.0.2 via fe-0/0/0.0, selected
    State: <Active Int>
  Age: 36
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (1): 0-KRT
    AS path: I
```

[show route protocol arp](#)

```
user@host> show route protocol arp
inet.0: 43 destinations, 43 routes (42 active, 0 holddown, 1 hidden)

inet.3: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

cust1.inet.0: 1033 destinations, 2043 routes (1033 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

20.20.1.3/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
```

```

Unusable
20.20.1.4/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.5/32      [ARP/4294967293] 00:04:32, from 20.20.1.1
Unusable
20.20.1.6/32      [ARP/4294967293] 00:04:34, from 20.20.1.1
Unusable
20.20.1.7/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.8/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.9/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.10/32     [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.11/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
20.20.1.12/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
20.20.1.13/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
...

```

show route protocol bgp

```

user@host> show route protocol bgp 192.168.64.0/21
inet.0: 335832 destinations, 335833 routes (335383 active, 0 holddown, 450 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.64.0/21      *[BGP/170] 6d 10:41:16, localpref 100, from 192.168.69.71
                    AS path: 10458 14203 2914 4788 4788 I
                    > to 192.168.167.254 via fxp0.0

```

show route protocol bgp detail

```

user@host> show route protocol bgp 66.117.63.0/24 detail
inet.0: 335805 destinations, 335806 routes (335356 active, 0 holddown, 450 hidden)
66.117.63.0/24      (1 entry, 1 announced)
    *BGP           Preference: 170/-101
                    Next hop type: Indirect
                    Next-hop reference count: 1006436
                    Source: 192.168.69.71
                    Next hop type: Router, Next hop index: 324
                    Next hop: 192.168.167.254 via fxp0.0, selected
                    Protocol next hop: 192.168.69.71
                    Indirect next hop: 8e166c0 342
                    State: <Active Ext>
                    Local AS: 69 Peer AS: 10458
                    Age: 6d 10:42:42 Metric2: 0
                    Task: BGP_10458.192.168.69.71+179
                    Announcement bits (3): 0-KRT 2-BGP RT Background 3-Resolve tree

1
    AS path: 10458 14203 2914 4788 4788 I
    Communities: 2914:410 2914:2403 2914:3400
    Accepted
    Localpref: 100
    Router ID: 207.17.136.192

```

show route protocol bgp detail (Labeled Unicast)

```
user@host> show route protocol bgp 1.1.1.8/32 detail
inet.0: 45 destinations, 46 routes (45 active, 0 holddown, 0 hidden)
1.1.1.8/32 (2 entries, 2 announced)
State:
*BGP Preference: 1/-101
Next hop type: Indirect, Next hop index: 0
Address: 0xc007f30
Next-hop reference count: 2
Source: 1.1.1.1
Next hop type: Router, Next hop index: 614
Next hop: 20.1.1.2 via ge-0/0/1.0, selected
Label-switched-path lsp1
Label operation: Push 1000126, Push 1000125, Push 1000124, Push 1000123, Push
299872(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 1000126: None; Label 1000125: None; Label 1000124: None;
Label 1000123: None; Label 299872: None;
Label element ptr: 0xc007860
Label parent element ptr: 0xc0089a0
Label element references: 1
Label element child references: 0
Label element lsp id: 0
Session Id: 0x140
Protocol next hop: 1.1.1.4
Label operation: Push 1000126, Push 1000125, Push 1000124, Push 1000123(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl, prop-ttl
Load balance label: Label 1000126: None; Label 1000125: None; Label 1000124: None;
Label 1000123: None;
Indirect next hop: 0xae8d300 1048576 INH Session ID: 0x142
State:
Local AS: 5 Peer AS: 5
Age: 22:43 Metric2: 2
Validation State: unverified
Task: BGP_5.1.1.1.1
Announcement bits (2): 0-KRT 7-Resolve tree 2
AS path: I
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Localpref: 100
Router ID: 1.1.1.1
```

show route protocol bgp detail (Aggregate Extended Community Bandwidth)

```
user@host> show route 10.0.2.0 protocol bgp detail
inet.0: 20 destinations, 26 routes (20 active, 0 holddown, 0 hidden)
10.0.2.0/30 (2 entries, 1 announced)
*BGP Preference: 170/-101
Next hop type: Router, Next hop index: 0
Address: 0xb618990
Next-hop reference count: 3
Source: 10.0.1.1
Next hop: 10.0.0.2 via ge-0/0/0.0 balance 40%
Session Id: 0x0
Next hop: 10.0.1.1 via ge-0/0/1.0 balance 60%, selected
Session Id: 0x0
State: <Active Ext>
Local AS: 65000 Peer AS: 65001
Age: 20:33
```



```

Validation State: unverified
Task: BGP_65001.10.0.1.1
Announcement bits (3): 0-KRT 2-BGP_Listen.0.0.0.0+179
3-BGP_RT_Background
AS path: 65001 I
Communities: bandwidth:65000:60000000
Accepted Multipath
Localpref: 100
Router ID: 128.49.121.137
BGP Preference: 170/-101
Next hop type: Router, Next hop index: 595
Address: 0xb7a1330
Next-hop reference count: 9
Source: 10.0.0.2
Next hop: 10.0.0.2 via ge-0/0/0.0, selected
Session Id: 0x141
State: <NotBest Ext>
Inactive reason: Not Best in its group - Active preferred
Local AS: 65000 Peer AS: 65001
Age: 20:33
Validation State: unverified
Task: BGP_65001.10.0.0.2
AS path: 65001 I
Communities: bandwidth:65000:40000000
Accepted MultipathContrib
Localpref: 100
Router ID: 128.49.121.132

```

show route protocol bgp extensive

```

user@host> show route protocol bgp 192.168.64.0/21 extensive

inet.0: 335827 destinations, 335828 routes (335378 active, 0 holddown, 450 hidden)
192.168.64.0/21 (1 entry, 1 announced)
TSI:
KRT in-kernel 1.9.0.0/16 -> {indirect(342)}
Page 0 idx 1 Type 1 val db31a80
  Nexthop: Self
  AS path: [69] 10458 14203 2914 4788 4788 I
  Communities: 2914:410 2914:2403 2914:3400
Path 1.9.0.0 from 192.168.69.71 Vector len 4. Val: 1
  *BGP Preference: 170/-101
    Next hop type: Indirect
    Next-hop reference count: 1006502
    Source: 192.168.69.71
    Next hop type: Router, Next hop index: 324
    Next hop: 192.168.167.254 via fxp0.0, selected
    Protocol next hop: 192.168.69.71
    Indirect next hop: 8e166c0 342
    State: <Active Ext>
    Local AS: 69 Peer AS: 10458
    Age: 6d 10:44:45 Metric2: 0
    Task: BGP_10458.192.168.69.71+179
    Announcement bits (3): 0-KRT 2-BGP RT Background 3-Resolve tree
1
  AS path: 10458 14203 2914 4788 4788 I
  Communities: 2914:410 2914:2403 2914:3400
  Accepted
  Localpref: 100
  Router ID: 207.17.136.192
  Indirect next hops: 1

```

```

Protocol next hop: 192.168.69.71
Indirect next hop: 8e166c0 342
Indirect path forwarding next hops: 1
  Next hop type: Router
  Next hop: 192.168.167.254 via fxp0.0
192.168.0.0/16 Originating RIB: inet.0
  Node path count: 1
  Forwarding nexthops: 1
  Nexthop: 192.168.167.254 via fxp0.0

```

show route protocol bgp terse

```

user@host> show route protocol bgp 192.168.64.0/21 terse

inet.0: 24 destinations, 32 routes (23 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
192.168.64.0/21    B 170      100          >172.16.100.1  10023 21 I

```

show route protocol direct

```

user@host> show route protocol direct

inet.0: 335843 destinations, 335844 routes (335394 active, 0 holddown, 450 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.8.0/24      *[Direct/0] 17w0d 10:31:49
> via fe-1/3/1.0
10.255.165.1/32    *[Direct/0] 25w4d 04:13:18
> via lo0.0
172.16.30.0/24     *[Direct/0] 17w0d 23:06:26
> via fe-1/3/2.0
192.168.164.0/22   *[Direct/0] 25w4d 04:13:20
> via fxp0.0

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

47.0005.80ff.f800.0000.0108.0001.0102.5516.5001/152
*[Direct/0] 25w4d 04:13:21
> via lo0.0

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::10:255:165:1/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0
fe80::2a0:a5ff:fe12:ad7/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0

```

show route protocol frr

```

user@host> show route protocol frr

inet.0: 43 destinations, 43 routes (42 active, 0 holddown, 1 hidden)

inet.3: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

```

```

cust1.inet.0: 1033 destinations, 2043 routes (1033 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

20.20.1.3/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.3 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.4/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.4 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.5/32      *[FRR/200] 00:05:35, from 20.20.1.1
                  > to 20.20.1.5 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.6/32      *[FRR/200] 00:05:37, from 20.20.1.1
                  > to 20.20.1.6 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.7/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.7 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.8/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.8 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.9/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.9 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.10/32     *[FRR/200] 00:05:38, from 20.20.1.1
...

```

show route protocol l2circuit detail

```
user@host> show route protocol l2circuit detail
```

```
mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
```

```
100000 (1 entry, 1 announced)
```

```

*L2CKT Preference: 7
  Next hop: via ge-2/0/0.0, selected
  Label operation: Pop      Offset: 4
  State: <Active Int>
  Local AS: 99
  Age: 9:52
  Task: Common L2 VC
  Announcement bits (1): 0-KRT
  AS path: I

```

```
ge-2/0/0.0 (1 entry, 1 announced)
```

```

*L2CKT Preference: 7
  Next hop: via so-1/1/2.0 weight 1, selected
  Label-switched-path my-lsp
  Label operation: Push 100000, Push 100000(top)[0] Offset: -4
  Protocol next hop: 10.245.255.63
  Push 100000 Offset: -4
  Indirect next hop: 86af0c0 298
  State: <Active Int>
  Local AS: 99
  Age: 9:52
  Task: Common L2 VC
  Announcement bits (2): 0-KRT 1-Common L2 VC
  AS path: I

```

```
l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
```

```
10.245.255.63:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
```

```

*L2CKT Preference: 7
Next hop: via so-1/1/2.0 weight 1, selected
Label-switched-path my-lsp
Label operation: Push 100000[0]
Protocol next hop: 10.245.255.63 Indirect next hop: 86af000 296
State: <Active Int>
Local AS: 99
Age: 10:21
Task: l2 circuit
Announcement bits (1): 0-LDP
AS path: I
VC Label 100000, MTU 1500, VLAN ID 512

```

show route protocol l2vpn extensive

```

user@host> show route protocol l2vpn extensive

inet.0: 14 destinations, 15 routes (13 active, 0 holddown, 1 hidden)

inet.3: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
800001 (1 entry, 1 announced)
TSI:
KRT in-kernel 800001 /36 -> {so-0/0/0.0}
    *L2VPN Preference: 7
      Next hop: via so-0/0/0.0 weight 49087 balance 97%, selected
      Label operation: Pop      Offset: 4
      State: <Active Int>
      Local AS: 69
      Age: 7:48
      Task: Common L2 VC
      Announcement bits (1): 0-KRT
      AS path: I

so-0/0/0.0 (1 entry, 1 announced)
TSI:
KRT in-kernel so-0/0/0.0 /16 -> {indirect(288)}
    *L2VPN Preference: 7
      Next hop: via so-0/0/1.0, selected
      Label operation: Push 800000 Offset: -4
      Protocol next hop: 10.255.14.220
      Push 800000 Offset: -4
      Indirect next hop: 85142a0 288
      State: <Active Int>
      Local AS: 69
      Age: 7:48
      Task: Common L2 VC
      Announcement bits (2): 0-KRT 1-Common L2 VC
      AS path: I
      Communities: target:69:1 Layer2-info: encaps:PPP,
      control flags:2, mtu: 0

```

show route protocol ldp

```

user@host> show route protocol ldp

inet.0: 12 destinations, 13 routes (12 active, 0 holddown, 0 hidden)

```

```

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.16.1/32    *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Push 100000
192.168.17.1/32    *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0

private1___.inet.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

mpls.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

100064            *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Pop
100064(S=0)        *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Pop
100080            *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Swap 100000

```

show route protocol ldp extensive

```

user@host> show route protocol ldp extensive
192.168.16.1/32 (1 entry, 1 announced)
  State: <FlashAll>
  *LDP   Preference: 9
         Next-hop reference count: 3
         Next hop: via t1-4/0/0.0, selected
         Label operation: Push 100000
         State: <Active Int>
         Local AS: 64500
         Age: 1d 23:03:58           Metric: 1
         Task: LDP
         Announcement bits (2): 0-Resolve tree 1 2-Resolve tree 2
         AS path: I

192.168.17.1/32 (1 entry, 1 announced)
  State: <FlashAll>
  *LDP   Preference: 9
         Next-hop reference count: 3
         Next hop: via t1-4/0/0.0, selected
         State: <Active Int>
         Local AS: 64500
         Age: 1d 23:03:58           Metric: 1
         Task: LDP
         Announcement bits (2): 0-Resolve tree 1 2-Resolve tree 2
         AS path: I

private1___.inet.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

mpls.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)

100064 (1 entry, 1 announced)
TSI:
KRT in-kernel 100064 /36 -> {t1-4/0/0.0}
  *LDP   Preference: 9
         Next-hop reference count: 2
         Next hop: via t1-4/0/0.0, selected
         State: <Active Int>
         Local AS: 64500
         Age: 1d 23:03:58           Metric: 1

```

```

Task: LDP
Announcement bits (1): 0-KRT
AS path: I
Prefixes bound to route: 192.168.17.1/32

100064(S=0) (1 entry, 1 announced)
TSI:
KRT in-kernel 100064 /40 -> {t1-4/0/0.0}
    *LDP    Preference: 9
            Next-hop reference count: 2
            Next hop: via t1-4/0/0.0, selected
            Label operation: Pop
            State: <Active Int>
            Local AS: 64500
            Age: 1d 23:03:58      Metric: 1
            Task: LDP
            Announcement bits (1): 0-KRT
            AS path: I

100080 (1 entry, 1 announced)
TSI:
KRT in-kernel 100080 /36 -> {t1-4/0/0.0}
    *LDP    Preference: 9
            Next-hop reference count: 2
            Next hop: via t1-4/0/0.0, selected
            Label operation: Swap 100000
            State: <Active Int>
            Local AS: 64500
            Age: 1d 23:03:58      Metric: 1
            Task: LDP
            Announcement bits (1): 0-KRT
            AS path: I
            Prefixes bound to route: 192.168.16.1/32

```

show route protocol ospf (Layer 3 VPN)

```

user@host> show route protocol ospf
inet.0: 40 destinations, 40 routes (39 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.4/30      *[OSPF/10] 00:05:18, metric 4
                  > via t3-3/2/0.0
10.39.1.8/30      [OSPF/10] 00:05:18, metric 2
                  > via t3-3/2/0.0
10.255.14.171/32  *[OSPF/10] 00:05:18, metric 4
                  > via t3-3/2/0.0
10.255.14.179/32  *[OSPF/10] 00:05:18, metric 2
                  > via t3-3/2/0.0
172.16.233.5/32   *[OSPF/10] 20:25:55, metric 1

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.16/30      [OSPF/10] 00:05:43, metric 1
                  > via so-0/2/2.0
10.255.14.173/32   *[OSPF/10] 00:05:43, metric 1
                  > via so-0/2/2.0
172.16.233.5/32   *[OSPF/10] 20:26:20, metric 1

```

show route protocol ospf detail

```

user@host> show route protocol ospf detail
VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.16/30 (2 entries, 0 announced)
  OSPF Preference: 10
    Nexthop: via so-0/2/2.0, selected
    State: <Int>
    Inactive reason: Route Preference
    Age: 6:25 Metric: 1
    Area: 0.0.0.0
    Task: VPN-AB-OSPF
    AS path: I
    Communities: Route-Type:0.0.0.0:1:0

...

```

show route protocol rip

```

user@host> show route protocol rip
inet.0: 26 destinations, 27 routes (25 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.255.14.177/32 * [RIP/100] 20:24:34, metric 2
                  > to 10.39.1.22 via t3-0/2/2.0
172.16.233.9/32 * [RIP/100] 00:03:59, metric 1

```

show route protocol rip detail

```

user@host> show route protocol rip detail
inet.0: 26 destinations, 27 routes (25 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.255.14.177/32 (1 entry, 1 announced)
  *RIP Preference: 100
    Nexthop: 10.39.1.22 via t3-0/2/2.0, selected
    State: <Active Int>
    Age: 20:25:02 Metric: 2
    Task: VPN-AB-RIPv2
    Announcement bits (2): 0-KRT 2-BGP.0.0.0.0+179
    AS path: I
    Route learned from 10.39.1.22 expires in 96 seconds

```

show route protocol ripng table inet6

```

user@host> show route protocol ripng table inet6
inet6.0: 4215 destinations, 4215 routes (4214 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

1111::1/128 * [RIPng/100] 02:13:33, metric 2
              > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::2/128 * [RIPng/100] 02:13:33, metric 2
              > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::3/128 * [RIPng/100] 02:13:33, metric 2

```

```
1111::4/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
1111::5/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
1111::6/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
                  > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
```

show route protocol static detail

```
user@host> show route protocol static detail
inet.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
10.5.0.0/16 (1 entry, 1 announced)
    *Static Preference: 5
        Next hop type: Router, Next hop index: 324
        Address: 0x9274010
        Next-hop reference count: 27
        Next hop: 192.168.187.126 via fxp0.0, selected
        Session Id: 0x0
        State: <Active NoReadvrt Int Ext>
        Age: 7w3d 21:24:25
        Validation State: unverified
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

10.10.0.0/16 (1 entry, 1 announced)
    *Static Preference: 5
        Next hop type: Router, Next hop index: 324
        Address: 0x9274010
        Next-hop reference count: 27
        Next hop: 192.168.187.126 via fxp0.0, selected
        Session Id: 0x0
        State: <Active NoReadvrt Int Ext>
        Age: 7w3d 21:24:25
        Validation State: unverified
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

10.13.10.0/23 (1 entry, 1 announced)
    *Static Preference: 5
        Next hop type: Router, Next hop index: 324
        Address: 0x9274010
        Next-hop reference count: 27
        Next hop: 192.168.187.126 via fxp0.0, selected
        Session Id: 0x0
        State: <Active NoReadvrt Int Ext>
        Age: 7w3d 21:24:25
        Validation State: unverified
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I
```


show route receive-protocol

List of Syntax	Syntax on page 413 Syntax (EX Series Switches) on page 413
Syntax	show route receive-protocol <i>protocol neighbor-address</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)
Syntax (EX Series Switches)	show route receive-protocol <i>protocol neighbor-address</i> <brief detail extensive terse>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the routing information as it was received through a particular neighbor using a particular dynamic routing protocol.
Options	<p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>protocol neighbor-address</i>—Protocol transmitting the route (bgp, dvmrp, msdp, pim, rip, or ripng) and address of the neighboring router from which the route entry was received.</p>
Additional Information	The output displays the selected routes and the attributes with which they were received, but does not show the effects of import policy on the routing attributes.
Required Privilege Level	view
List of Sample Output	show route receive-protocol bgp on page 416 show route receive-protocol bgp extensive on page 416 show route receive-protocol bgp table extensive on page 417 show route receive-protocol bgp logical-system extensive on page 417 show route receive-protocol bgp detail (Layer 2 VPN) on page 418 show route receive-protocol bgp extensive (Layer 2 VPN) on page 418 show route receive-protocol bgp (Layer 3 VPN) on page 419 show route receive-protocol bgp detail (Layer 3 VPN) on page 419 show route receive-protocol bgp detail (Long-Lived Graceful Restart) on page 420 show route receive-protocol bgp detail (Labeled Unicast) on page 420 show route receive-protocol bgp extensive (Layer 3 VPN) on page 421 Show route receive protocol (Segment Routing Traffic Engineering) on page 421

Output Fields Table 27 on page 414 describes the output fields for the **show route receive-protocol** command. Output fields are listed in the approximate order in which they appear.

Table 27: show route receive-protocol Output Fields

Field Name	Field Description	Level of Output
<i>routing-table-name</i>	Name of the routing table—for example, inet.0.	All levels
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.	All levels
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active • holddown (routes that are in pending state before being declared inactive) • hidden (routes that are not used because of a routing policy) 	All levels
Prefix	Destination prefix.	none brief
MED	Multiple exit discriminator value included in the route.	none brief
<i>destination-prefix</i> (entry, announced)	Destination prefix. The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination.	detail extensive
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.	detail extensive
Accepted LongLivedStaleImport	The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag. Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table	detail extensive
ImportAccepted LongLivedStaleImport	Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.	detail extensive
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.	detail extensive
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.	detail extensive

Table 27: show route receive-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
VPN Label	Virtual private network (VPN) label. Packets are sent between CE and PE routing devices by advertising VPN labels. VPN labels transit over either an RSVP or an LDP label-switched path (LSP) tunnel.	detail extensive
Next hop	Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.	All levels
Localpref or Lclpref	Local preference value included in the route.	All levels
AS path	<p>Autonomous system (AS) path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used the AS-path merge process, as defined in RFC 4893. • []—If more than one AS number is configured on the router, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>	All levels
Route Labels	Stack of labels carried in the BGP route update.	detail extensive
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.	detail extensive
Originator ID	(For route reflected output only) Address of routing device that originally sent the route to the route reflector.	detail extensive
Communities	Community path attribute for the route. See the Output Field table in the show route detail command for all possible values for this field.	detail extensive
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.	detail extensive
Attrset AS	Number, local preference, and path of the AS that originated the route. These values are stored in the Attrset attribute at the originating routing device.	detail extensive

Table 27: show route receive-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).	detail extensive
control flags	Control flags: none or Site Down .	detail extensive
mtu	Maximum transmission unit (MTU) of the Layer 2 circuit.	detail extensive

Sample Output

show route receive-protocol bgp

```

user@host> show route receive-protocol bgp 10.255.245.215

inet.0: 28 destinations, 33 routes (27 active, 0 holddown, 1 hidden)
Prefix          Next hop          MED      Lclpref  AS path
10.22.1.0/24     10.255.245.215    0        100      I
10.22.2.0/24     10.255.245.215    0        100      I

```

show route receive-protocol bgp extensive

```

user@host> show route receive-protocol bgp 10.255.245.63 extensive
inet.0: 244 destinations, 244 routes (243 active, 0 holddown, 1 hidden)
Prefix          Next hop          MED      Lclpref  AS path
172.16.1.0/24 (1 entry, 1 announced)
  Next hop: 10.0.50.3
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.45
172.16.163.0/16 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.68
172.16.164.0/16 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.45
172.16.195.0/24 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.68
inet.2: 63 destinations, 63 routes (63 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
inet.3: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
mpls.0: 48 destinations, 48 routes (48 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp table extensive

```

user@host> show route receive-protocol bgp 207.17.136.192 table inet.0 66.117.68.0/24 extensive
inet.0: 227315 destinations, 227316 routes (227302 active, 0 holddown, 13 hidden)
* 66.117.63.0/24 (1 entry, 1 announced)
  Nexthop: 207.17.136.29
  Localpref: 100
  AS path: AS2 PA[6]: 14203 2914 3356 29748 33437 AS_TRANS
  AS path: AS4 PA[2]: 33437 393219
  AS path: Merged[6]: 14203 2914 3356 29748 33437 393219 I
  Communities: 2914:420

```

show route receive-protocol bgp logical-system extensive

```

user@host> show route receive-protocol bgp 10.0.0.9 logical-system PE4 extensive
inet.0: 12 destinations, 13 routes (12 active, 0 holddown, 0 hidden)
* 10.0.0.0/30 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.0.0.4/30 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

10.0.0.8/30 (2 entries, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.9.9.1/32 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.100.1.1/32 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 172.16.44.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300096
  Nexthop: 10.0.0.9
  AS path: 13979 I
  AIGP: 203

* 172.16.55.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300112
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I
  AIGP: 25

```

```

* 172.16.66.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300144
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I

* 172.16.99.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300160
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I

```

show route receive-protocol bgp detail (Layer 2 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.171 detail
inet.0: 68 destinations, 68 routes (67 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED      Lclpref AS path
inet.3: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
mpls.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
frame-vpn.l2vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0
hidden)
Prefix          Nexthop          MED      Lclpref AS path
10.255.245.35:1:5:1/96 (1 entry, 1 announced)
  Route Distinguisher: 10.255.245.35:1
  Label-base : 800000, range : 4, status-vector : 0x0
  Nexthop: 10.255.245.35
  Localpref: 100
  AS path: I
  Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags: 0, mtu: 0
bgp.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
10.255.245.35:1:5:1/96 (1 entry, 0 announced)
  Route Distinguisher: 10.255.245.35:1
  Label-base : 800000, range : 4, status-vector : 0x0
  Nexthop: 10.255.245.35
  Localpref: 100
  AS path: I
  Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0

```

show route receive-protocol bgp extensive (Layer 2 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.171 extensive
inet.0: 68 destinations, 68 routes (67 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED      Lclpref AS path
inet.3: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
mpls.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
frame-vpn.l2vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lclpref AS path
10.255.245.35:1:5:1/96 (1 entry, 1 announced)
  Route Distinguisher: 10.255.245.35:1

```

```

Label-base : 800000, range : 4, status-vector : 0x0
Nexthop: 10.255.245.35
Localpref: 100
AS path: I
Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0
bgp.12vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.245.35:1:5:1/96 (1 entry, 0 announced)
Route Distinguisher: 10.255.245.35:1
Label-base : 800000, range : 4, status-vector : 0x0
Nexthop: 10.255.245.35
Localpref: 100
AS path: I
Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0

```

show route receive-protocol bgp (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.171
inet.0: 33 destinations, 33 routes (32 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED    Lclpref AS path
inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
VPN-A.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.175/32  10.255.14.171          100 2 I
10.255.14.179/32  10.255.14.171          2    100 I
VPN-B.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.175/32  10.255.14.171          100 2 I
10.255.14.177/32  10.255.14.171          100 I
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
mpls.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
bgp.13vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.171:300:10.255.14.177/32
10.255.14.171          100 I
10.255.14.171:100:10.255.14.179/32
10.255.14.171          2    100 I
10.255.14.171:200:10.255.14.175/32
10.255.14.171          100 2 I

```

show route receive-protocol bgp detail (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.174 detail
inet.0: 16 destinations, 17 routes (15 active, 0 holddown, 1 hidden)
inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
vpna.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
* 10.49.0.0/30 (1 entry, 1 announced)
Route Distinguisher: 10.255.14.176:2
VPN Label: 101264
Nexthop: 10.255.14.174
Localpref: 100
AS path: I
Communities: target:200:100
AttrSet AS: 100
Localpref: 100

```

```

      AS path: I
* 10.255.14.172/32 (1 entry, 1 announced)
  Route Distinguisher: 10.255.14.176:2
  VPN Label: 101280
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
bgp.l3vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
* 10.255.14.174:2:10.49.0.0/30 (1 entry, 0 announced)
  Route Distinguisher: 10.255.14.174:2
  VPN Label: 101264
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
* 10.255.14.174:2:10.255.14.172/32 (1 entry, 0 announced)
  Route Distinguisher: 10.255.14.174:2
  VPN Label: 101280
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp detail (Long-Lived Graceful Restart)

```

user@host> show route receive-protocol bgp 10.4.12.11 detail

bgp.l2vpn.0: 38 destinations, 39 routes (37 active, 0 holddown, 1 hidden)
* 172.16.1.4:100:172.16.1.4/96 AD (1 entry, 1 announced)
  Accepted LongLivedStale LongLivedStaleImport
  Nexthop: 10.4.12.11
  Localpref: 100
  AS path: I

```

show route receive-protocol bgp detail (Labeled Unicast)

```

user@host> show route receive-protocol bgp 1.1.1.1 detail
inet.0: 45 destinations, 46 routes (45 active, 0 holddown, 0 hidden)
* 1.1.1.8/32 (2 entries, 2 announced)
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: 1.1.1.4
Localpref: 100
AS path: I
Entropy label capable, next hop field matches route next hop

inet.3: 15 destinations, 21 routes (6 active, 0 holddown, 14 hidden)

```



```

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 11 destinations, 11 routes (11 active, 0 holddown, 0 hidden)

inet6.0: 26 destinations, 28 routes (26 active, 0 holddown, 0 hidden)

* 100::1/128 (2 entries, 2 announced)
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: I

inet6.3: 22 destinations, 23 routes (22 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp extensive (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.245.63 extensive
inet.0: 244 destinations, 244 routes (243 active, 0 holddown, 1 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
  172.16.1.0/24 (1 entry, 1 announced)
    Nexthop: 10.0.50.3
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.45
  172.16.163.0/16 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.68
  172.16.164.0/16 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.45
  172.16.195.0/24 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.68
inet.2: 63 destinations, 63 routes (63 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
inet.3: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
mpls.0: 48 destinations, 48 routes (48 active, 0 holddown, 0 hidden)

```

Show route receive protocol (Segment Routing Traffic Engineering)

```

show route receive protocol bgp 10.1.1.4
bgp.inetcolor.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

* 50-4.4.4.4-1234<sr6>/96 (1 entry, 0 announced)
  Import Accepted

```

```
Distinguisher: 50
Color: 1234
Nexthop: 10.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
inetcolor.0: 6 destinations, 7 routes (6 active, 0 holddown, 0 hidden)
```

```
* 4.4.4.4-1234<c6>/64 (1 entry, 1 announced)
```

```
Import Accepted
Color: 1234
Nexthop: 10.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
user@host# run show route receive-protocol bgp 5001:1::4
```

```
bgp.inet6color.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
```

```
* 50-2001:1::4-1234<sr6>/192 (1 entry, 0 announced)
```

```
Import Accepted
Distinguisher: 50
Color: 1234
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
inet6color.0: 6 destinations, 7 routes (6 active, 0 holddown, 0 hidden)
```

```
* 2001::5-1234<c6>/160 (1 entry, 1 announced)
```

```
Import Accepted
Color: 1234
Nexthop: ::ffff:1.1.1.5
Localpref: 100
AS path: 3 I
Communities: target:2:1
```

show route table

List of Syntax	Syntax on page 423 Syntax (EX Series Switches, QFX Series Switches) on page 423
Syntax	show route table <i>routing-table-name</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switches, QFX Series Switches)	show route table <i>routing-table-name</i> <brief detail extensive terse>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 14.1X53-D15 for QFX Series switches. Show route table evpn statement introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.
Description	Display the route entries in a particular routing table.
Options	brief detail extensive terse —(Optional) Display the specified level of output. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>routing-table-name</i> —Display route entries for all routing tables whose names begin with this string (for example, inet.0 and inet6.0 are both displayed when you run the show route table inet command).
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show route summary
List of Sample Output	show route table bgp.l2.vpn on page 434 show route table bgp.l3vpn.0 on page 434 show route table bgp.l3vpn.0 detail on page 435 show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured) on page 436 show route table bgp.evpn.0 on page 436 show route table evpna.evpn.0 on page 437 show route table inet.0 on page 437 show route table inet.3 on page 438 show route table inet.3 protocol ospf on page 438 show route table inet6.0 on page 438 show route table inet6.3 on page 438

[show route table inetflow detail on page 439](#)
[show route table lsdist.0 extensive on page 439](#)
[show route table l2circuit.0 on page 441](#)
[show route table mpls on page 441](#)
[show route table mpls extensive on page 441](#)
[show route table mpls.0 on page 442](#)
[show route table mpls.0 detail \(PTX Series\) on page 443](#)
[show route table mpls.0 ccc ge-0/0/1.1004 detail on page 443](#)
[show route table mpls.0 protocol evpn on page 444](#)
[show route table mpls.0 protocol ospf on page 450](#)
[show route table mpls.0 extensive \(PTX Series\) on page 451](#)
[show route table mpls.0 \(RSVP Route—Transit LSP\) on page 451](#)
[show route table vpls_1 detail on page 452](#)
[show route table vpn-a on page 452](#)
[show route table vpn-a.mdt.0 on page 452](#)
[show route table VPN-A detail on page 453](#)
[show route table VPN-AB.inet.0 on page 453](#)
[show route table VPN_blue.mvpn-inet6.0 on page 454](#)
[show route table vrf1.mvpn.0 extensive on page 454](#)
[show route table inetflow detail on page 454](#)
[show route table bgp.evpn.0 extensive |no-more \(EVPN\) on page 457](#)

Output Fields [Table 17 on page 275](#) describes the output fields for the **show route table** command. Output fields are listed in the approximate order in which they appear.

Table 28: show route table Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
Restart complete	<p>All protocols have restarted for this routing table.</p> <p>Restart state:</p> <ul style="list-style-type: none"> • Pending:<i>protocol-name</i>—List of protocols that have not yet completed graceful restart for this routing table. • Complete—All protocols have restarted for this routing table. <p>For example, if the output shows-</p> <ul style="list-style-type: none"> • LDP.inet.0 : 5 routes (4 active, 1 holddown, 0 hidden) Restart Pending: OSPF LDP VPN <p>This indicates that OSPF, LDP, and VPN protocols did not restart for the LDP.inet.0 routing table.</p> <ul style="list-style-type: none"> • vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden) Restart Complete <p>This indicates that all protocols have restarted for the vpls_1.l2vpn.0 routing table.</p>
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route-destination</i> (entry, announced)	<p>Route destination (for example:10.0.0.1/24). The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote. • inclusive multicast Ethernet tag route—Type of route destination represented by (for example, 3:100.100.100.10:100::0::10::100.100.100.10/384): <ul style="list-style-type: none"> • route distinguisher—(8 octets) Route distinguisher (RD) must be the RD of the EVPN instance (EVI) that is advertising the NLRI. • Ethernet tag ID—(4 octets) Identifier of the Ethernet tag. Can set to 0 or to a valid Ethernet tag value. • IP address length—(1 octet) Length of IP address in bits. • originating router's IP address—(4 or 16 octets) Must set to the provider edge (PE) device's IP address. This address should be common for all EVIs on the PE device, and may be the PE device's loopback address.
<i>label stacking</i>	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of 2 or more exits this routing device with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>
Level	(IS-IS only). In IS-IS, a single AS can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).
Next-hop type	Type of next hop. For a description of possible values for this field, see Table 20 on page 319 .
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path <i>lsp-path-name</i>	Name of the LSP used to reach the next hop.

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to derive a forwarding next hop.
Indirect next hop	Index designation used to specify the mapping between protocol next hops, tags, kernel export policy, and the forwarding next hops.
State	State of the route (a route can be in more than one state). See Table 21 on page 321 .
Local AS	AS number of the local routing devices.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances.
Task	Name of the protocol that has added the route.
Announcement bits	<p>The number of BGP peers or protocols to which Junos OS has announced this route, followed by the list of the recipients of the announcement. Junos OS can also announce the route to the kernel routing table (KRT) for installing the route into the Packet Forwarding Engine, to a resolve tree, a Layer 2 VC, or even a VPN. For example, <i>n-Resolve inet</i> indicates that the specified route is used for route resolution for next hops found in the routing table.</p> <ul style="list-style-type: none"> <i>n</i>—An index used by Juniper Networks customer support only.

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • Recorded—The AS path is recorded by the sample process (sampled). • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used in the AS-path merge process, as defined in RFC 4893. • []—If more than one AS number is configured on the routing device, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
FECs bound to route	Indicates point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, indicates the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, indicates the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Prefixes bound to route	Forwarding equivalent class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See Table 22 on page 323 for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down .
mtu	Maximum transmission unit (MTU) information.
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Accepted Multipath	Current active path when BGP multipath is configured.
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag might be displayed for a route. Neither of these flags is displayed at the same time as the Stale (ordinary GR stale) flag.
Accepted LongLivedStaleImport	<p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag might be displayed for a route. Neither of these flags is displayed at the same time as the Stale (ordinary GR stale) flag.</p> <p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table</p>
ImportAccepted LongLivedStaleImport	<p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table</p> <p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.</p>
Accepted MultipathContrib	Path currently contributing to BGP multipath.
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.

Table 28: show route table Output Fields (*continued*)

Field Name	Field Description
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.

Table 20 on page 319 describes all possible values for the Next-hop Types output field.

Table 29: Next-hop Types Output Field Values

Next-Hop Type	Description
Broadcast (bcast)	Broadcast next hop.
Deny	Deny next hop.
Discard	Discard next hop.
Flood	Flood next hop. Consists of components called branches, up to a maximum of 32 branches. Each flood next-hop branch sends a copy of the traffic to the forwarding interface. Used by point-to-multipoint RSVP, point-to-multipoint LDP, point-to-multipoint CCC, and multicast.
Hold	Next hop is waiting to be resolved into a unicast or multicast type.
Indexed (idxd)	Indexed next hop.
Indirect (indr)	Used with applications that have a protocol next hop address that is remote. You are likely to see this next-hop type for internal BGP (IBGP) routes when the BGP next hop is a BGP neighbor that is not directly connected.
Interface	Used for a network address assigned to an interface. Unlike the router next hop, the interface next hop does not reference any specific node on the network.
Local (locl)	Local address on an interface. This next-hop type causes packets with this destination address to be received locally.
Multicast (mcst)	Wire multicast next hop (limited to the LAN).
Multicast discard (mdsc)	Multicast discard.
Multicast group (mgrp)	Multicast group member.
Receive (recv)	Receive.
Reject (rjct)	Discard. An ICMP unreachable message was sent.

Table 29: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Resolve (rslv)	Resolving next hop.
Routed multicast (mcrtr)	Regular multicast next hop.
Router	<p>A specific node or set of nodes to which the routing device forwards packets that match the route prefix.</p> <p>To qualify as a next-hop type router, the route must meet the following criteria:</p> <ul style="list-style-type: none"> • Must not be a direct or local subnet for the routing device. • Must have a next hop that is directly connected to the routing device.
Table	Routing table next hop.
Unicast (ucst)	Unicast.
Unilist (ulst)	List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.

Table 21 on page 321 describes all possible values for the State output field. A route can be in more than one state (for example, <Active NoReadvrt Int Ext>).

Table 30: State Output Field Values

Value	Description
Accounting	Route needs accounting.
Active	Route is active.
Always Compare MED	Path with a lower multiple exit discriminator (MED) is available.
AS path	Shorter AS path is available.
Cisco Non-deterministic MED selection	Cisco nondeterministic MED is enabled, and a path with a lower MED is available.
Clone	Route is a clone.
Cluster list length	Length of cluster list sent by the route reflector.
Delete	Route has been deleted.
Ex	Exterior route.

Table 30: State Output Field Values (*continued*)

Value	Description
Ext	BGP route received from an external BGP neighbor.
FlashAll	Forces all protocols to be notified of a change to any route, active or inactive, for a prefix. When not set, protocols are informed of a prefix only when the active route changes.
Hidden	Route not used because of routing policy.
IfCheck	Route needs forwarding RPF check.
IGP metric	Path through next hop with lower IGP metric is available.
Inactive reason	Flags for this route, which was not selected as best for a particular destination.
Initial	Route being added.
Int	Interior route.
Int Ext	BGP route received from an internal BGP peer or a BGP confederation peer.
Interior > Exterior > Exterior via Interior	Direct, static, IGP, or EBGp path is available.
Local Preference	Path with a higher local preference value is available.
Martian	Route is a martian (ignored because it is obviously invalid).
MartianOK	Route exempt from martian filtering.
Next hop address	Path with lower metric next hop is available.
No difference	Path from neighbor with lower IP address is available.
NoReadvrt	Route not to be advertised.
NotBest	Route not chosen because it does not have the lowest MED.
Not Best in its group	Incoming BGP AS is not the best of a group (only one AS can be the best).
NotInstall	Route not to be installed in the forwarding table.
Number of gateways	Path with a greater number of next hops is available.
Origin	Path with a lower origin code is available.

Table 30: State Output Field Values (*continued*)

Value	Description
Pending	Route pending because of a hold-down configured on another route.
Release	Route scheduled for release.
RIB preference	Route from a higher-numbered routing table is available.
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.
Route Metric or MED comparison	Route with a lower metric or MED is available.
Route Preference	Route with lower preference value is available.
Router ID	Path through a neighbor with lower ID is available.
Secondary	Route not a primary route.
Unusable path	Path is not usable because of one of the following conditions: <ul style="list-style-type: none"> • The route is damped. • The route is rejected by an import policy. • The route is unresolved.
Update source	Last tiebreaker is the lowest IP address value.

[Table 22 on page 323](#) describes the possible values for the Communities output field.

Table 31: Communities Output Field Values

Value	Description
<i>area-number</i>	4 bytes, encoding a 32-bit area number. For AS-external routes, the value is 0. A nonzero value identifies the route as internal to the OSPF domain, and as within the identified area. Area numbers are relative to a particular OSPF domain.
bandwidth: local AS number:link-bandwidth-number	Link-bandwidth community value used for unequal-cost load balancing. When BGP has several candidate paths available for multipath purposes, it does not perform unequal-cost load balancing according to the link-bandwidth community unless all candidate paths have this attribute.
domain-id	Unique configurable number that identifies the OSPF domain.
domain-id-vendor	Unique configurable number that further identifies the OSPF domain.
<i>link-bandwidth-number</i>	Link-bandwidth number: from 0 through 4,294,967,295 (bytes per second).
<i>local AS number</i>	Local AS number: from 1 through 65,535.

Table 31: Communities Output Field Values (*continued*)

Value	Description
<i>options</i>	1 byte. Currently this is only used if the route type is 5 or 7 . Setting the least significant bit in the field indicates that the route carries a type 2 metric.
<i>origin</i>	(Used with VPNs) Identifies where the route came from.
<i>ospf-route-type</i>	1 byte, encoded as 1 or 2 for intra-area routes (depending on whether the route came from a type 1 or a type 2 LSA); 3 for summary routes; 5 for external routes (area number must be 0); 7 for NSSA routes; or 129 for sham link endpoint addresses.
<i>route-type-vendor</i>	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x8000 . The format is <i>area-number:ospf-route-type:options</i> .
<i>rte-type</i>	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x0306 . The format is <i>area-number:ospf-route-type:options</i> .
<i>target</i>	Defines which VPN the route participates in; target has the format <i>32-bit IP address:16-bit number</i> . For example, 10.19.0.0:100.
<i>unknown IANA</i>	Incoming IANA codes with a value between 0x1 and 0x7fff . This code of the BGP extended community attribute is accepted, but it is not recognized.
<i>unknown OSPF vendor community</i>	Incoming IANA codes with a value above 0x8000 . This code of the BGP extended community attribute is accepted, but it is not recognized.

Sample Output

show route table bgp.l2vpn

```

user@host> show route table bgp.l2vpn
bgp.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.24.1:1:4:1/96
    *[BGP/170] 01:08:58, localpref 100, from 192.168.24.1
    AS path: I
    > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am

```

show route table bgp.l3vpn.0

```

user@host> show route table bgp.l3vpn.0
bgp.l3vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.71.15:100:10.255.71.17/32
    *[BGP/170] 00:03:59, MED 1, localpref 100, from
10.255.71.15
    AS path: I
    > via so-2/1/0.0, Push 100020, Push 100011(top)
10.255.71.15:200:10.255.71.18/32

```

```

10.255.71.15          *[BGP/170] 00:03:59, MED 1, localpref 100, from
                        AS path: I
                        > via so-2/1/0.0, Push 100021, Push 100011(top)

```

show route table bgp.l3vpn.0 detail

```

user@host> show route table bgp.l3vpn.0 detail
bgp.l3vpn.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)

10.255.245.12:1:172.16.4.0/8 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182449
    Protocol next hop: 10.255.245.12
    Push 182449
    Indirect next hop: 863a630 297
    State: <Active Int Ext>
    Local AS: 35 Peer AS: 35
    Age: 12:19 Metric2: 1
    Task: BGP_35.10.255.245.12+179
    Announcement bits (1): 0-BGP.0.0.0.0+179
    AS path: 30 10458 14203 2914 3356 I (Atomic) Aggregator: 3356 4.68.0.11

    Communities: 2914:420 target:11111:1 origin:56:78
    VPN Label: 182449
    Localpref: 100
    Router ID: 10.255.245.12

10.255.245.12:1:4.17.225.0/24 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182465
    Protocol next hop: 10.255.245.12
    Push 182465
    Indirect next hop: 863a8f0 305
    State: <Active Int Ext>
    Local AS: 35 Peer AS: 35
    Age: 12:19 Metric2: 1
    Task: BGP_35.10.255.245.12+179
    Announcement bits (1): 0-BGP.0.0.0.0+179
  AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496 6496 6496 I
    Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
    VPN Label: 182465
    Localpref: 100
    Router ID: 10.255.245.12

10.255.245.12:1:4.17.226.0/23 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182465
    Protocol next hop: 10.255.245.12
    Push 182465
    Indirect next hop: 86bd210 330
    State: <Active Int Ext>

```

```

Local AS: 35 Peer AS: 35
Age: 12:19 Metric2: 1
Task: BGP_35.10.255.245.12+179
Announcement bits (1): 0-BGP.0.0.0.0+179
AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496 6496

6496 I
Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
VPN Label: 182465
Localpref: 100
Router ID: 10.255.245.12

10.255.245.12:1:4.17.251.0/24 (1 entry, 1 announced)
*BGP Preference: 170/-101
Route Distinguisher: 10.255.245.12:1
Source: 10.255.245.12
Next hop: 192.168.208.66 via fe-0/0/0.0, selected
Label operation: Push 182465
Protocol next hop: 10.255.245.12
Push 182465
Indirect next hop: 86bd210 330
State: <Active Int Ext>
Local AS: 35 Peer AS: 35
Age: 12:19 Metric2: 1
Task: BGP_35.10.255.245.12+179
Announcement bits (1): 0-BGP.0.0.0.0+179
AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496 6496

6496 I
Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
VPN Label: 182465
Localpref: 100

```

show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured)

```

user@host> show route table bgp.rtarget.0
bgp.rtarget.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

100:100:100/96
    *[RTarget/5] 00:03:14
        Type Proxy
        for 10.255.165.103
        for 10.255.166.124
        Local

```

show route table bgp.evpn.0

```

user@host> show route table bgp.evpn.0
bgp.evpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2:100.100.100.2:100::0::00:26:88:5f:67:b0/304
    *[BGP/170] 11:00:05, localpref 100, from 100.100.100.2
        AS path: I, validation-state: unverified
        > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1
2:100.100.100.2:100::0::00:51:51:51:51:51/304
    *[BGP/170] 11:00:05, localpref 100, from 100.100.100.2
        AS path: I, validation-state: unverified
        > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1

```



```

2:100.100.100.3:100::0::00:52:52:52:52:52/304
    *[BGP/170] 10:59:58, localpref 100, from 100.100.100.3
    AS path: I, validation-state: unverified
    > to 100.64.13.3 via ge-2/0/8.0, label-switched-path R0toR2
2:100.100.100.3:100::0::a8:d0:e5:5b:01:c8/304
    *[BGP/170] 10:59:58, localpref 100, from 100.100.100.3
    AS path: I, validation-state: unverified
    > to 100.64.13.3 via ge-2/0/8.0, label-switched-path R0toR2
3:100.100.100.2:100::1000::100.100.100.2/304
    *[BGP/170] 11:00:16, localpref 100, from 100.100.100.2
    AS path: I, validation-state: unverified
    > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1
3:100.100.100.2:100::2000::100.100.100.2/304
    *[BGP/170] 11:00:16, localpref 100, from 100.100.100.2
    AS path: I, validation-state: unverified
    > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1

```

show route table evpna.evpn.0

```

user@host> show route table evpna.evpn.0
evpna.evpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

3:100.100.100.10:100::0::10::100.100.100.10/384
    *[EVPN/170] 01:37:09
    Indirect
3:100.100.100.2:100::2000::100.100.100.2/304
    *[EVPN/170] 01:37:12
    Indirect

```

show route table inet.0

```

user@host> show route table inet.0
inet.0: 12 destinations, 12 routes (11 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

0.0.0.0/0      *[Static/5] 00:51:57
                > to 172.16.5.254 via fxp0.0
10.0.0.1/32    *[Direct/0] 00:51:58
                > via at-5/3/0.0
10.0.0.2/32    *[Local/0] 00:51:58
                Local
10.12.12.21/32 *[Local/0] 00:51:57
                Reject
10.13.13.13/32 *[Direct/0] 00:51:58
                > via t3-5/2/1.0
10.13.13.14/32 *[Local/0] 00:51:58
                Local
10.13.13.21/32 *[Local/0] 00:51:58
                Local
10.13.13.22/32 *[Direct/0] 00:33:59
                > via t3-5/2/0.0
127.0.0.1/32   [Direct/0] 00:51:58
                > via lo0.0
10.222.5.0/24  *[Direct/0] 00:51:58
                > via fxp0.0
10.222.5.81/32 *[Local/0] 00:51:58
                Local

```

show route table inet.3

```

user@host> show route table inet.3
inet.3: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32      *[LDP/9] 00:25:43, metric 10, tag 200
                  to 10.2.94.2 via lt-1/2/0.49
                  > to 10.2.3.2 via lt-1/2/0.23

```

show route table inet.3 protocol ospf

```

user@host> show route table inet.3 protocol ospf
inet.3: 9 destinations, 18 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1.1.1.20/32      [L-OSPF/10] 1d 00:00:56, metric 2
                  > to 10.0.10.70 via lt-1/2/0.14, Push 800020
                  to 10.0.6.60 via lt-1/2/0.12, Push 800020, Push 800030(top)
1.1.1.30/32      [L-OSPF/10] 1d 00:01:01, metric 3
                  > to 10.0.10.70 via lt-1/2/0.14, Push 800030
                  to 10.0.6.60 via lt-1/2/0.12, Push 800030
1.1.1.40/32      [L-OSPF/10] 1d 00:01:01, metric 4
                  > to 10.0.10.70 via lt-1/2/0.14, Push 800040
                  to 10.0.6.60 via lt-1/2/0.12, Push 800040
1.1.1.50/32      [L-OSPF/10] 1d 00:01:01, metric 5
                  > to 10.0.10.70 via lt-1/2/0.14, Push 800050
                  to 10.0.6.60 via lt-1/2/0.12, Push 800050
1.1.1.60/32      [L-OSPF/10] 1d 00:01:01, metric 6
                  > to 10.0.10.70 via lt-1/2/0.14, Push 800060
                  to 10.0.6.60 via lt-1/2/0.12, Pop

```

show route table inet6.0

```

user@host> show route table inet6.0
inet6.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Route, * = Both

fec0:0:0:3::/64 *[Direct/0] 00:01:34
>via fe-0/1/0.0

fec0:0:0:3::/128 *[Local/0] 00:01:34
>Local

fec0:0:0:4::/64 *[Static/5] 00:01:34
>to fec0:0:0:3::ffff via fe-0/1/0.0

```

show route table inet6.3

```

user@router> show route table inet6.3
inet6.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

::10.255.245.195/128
                  *[LDP/9] 00:00:22, metric 1
                  > via so-1/0/0.0
::10.255.245.196/128
                  *[LDP/9] 00:00:08, metric 1
                  > via so-1/0/0.0, Push 100008

```

show route table inetflow detail

```

user@host> show route table inetflow detail
inetflow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.12.44.1,*/48 (1 entry, 1 announced)
    *BGP    Preference: 170/-101
            Next-hop reference count: 2
            State: <Active Ext>
            Local AS: 64502 Peer AS: 64500
            Age: 4
            Task: BGP_64500.10.12.99.5+3792
            Announcement bits (1): 0-Flow
            AS path: 64500 I
            Communities: traffic-rate:0:0
            Validation state: Accept, Originator: 10.12.99.5
            Via: 10.12.44.0/24, Active
            Localpref: 100
            Router ID: 10.255.71.161

10.12.56.1,*/48 (1 entry, 1 announced)
    *Flow    Preference: 5
            Next-hop reference count: 2
            State: <Active>
            Local AS: 64502
            Age: 6:30
            Task: RT Flow
            Announcement bits (2): 0-Flow 1-BGP.0.0.0.0+179
            AS path: I
            Communities: 1:1

```

show route table lsdist.0 extensive

```

user@host> show route table lsdist.0 extensive
lsdist.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
NODE { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 ISIS-L1:0 }/1152
(1 entry, 1 announced)
TSI:
Page 0 idx 0, (group ibgp type Internal) Type 1 val 0xa62f378 (adv_entry)
  Advertised metrics:
    Nexthop: Self
    Localpref: 100
    AS path: [4170512532] I
    Communities:
Path NODE { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 ISIS-L1:0 }
Vector len 4. Val: 0
    *IS-IS  Preference: 15
            Level: 1
            Next hop type: Fictitious, Next hop index: 0
            Address: 0x95dfc64
            Next-hop reference count: 9
            State: <Active NotInstall>
            Local AS: 4170512532
            Age: 6:05
            Validation State: unverified
            Task: IS-IS
            Announcement bits (1): 0-BGP_RT_Background
            AS path: I
            IPv4 Router-ids:
                128.220.11.197
            Area membership:

```

```

47 00 05 80 ff f8 00 00 00 01 08 00 01
SPRING-Capabilities: - SRGB block [Start: 800000,
Range: 256, Flags: 0xc0]
SPRING-Algorithms:
- Algo: 0
LINK { Local { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }.{
IPv4:8.65.1.105 } Remote { AS:4170512532 BGP-LS ID:4170512532 ISO:4284.3300.5067)
TSI:
Page 0 idx 0, (group ibgp type Internal) Type 1 val 0xa62f3cc (adv_entry)
Advertised metrics:
Nexthop: Self
Localpref: 100
AS path: [4170512532] I
Communities:
Path LINK { Local { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }.{
IPv4:8.65.1.105 } Remote { AS:4170512532 BGP-LS ID:4170512532 ISO:4284.33000
*IS-IS Preference: 15
Level: 1
Next hop type: Fictitious, Next hop index: 0
Address: 0x95dfc64
Next-hop reference count: 9
State: <Active NotInstall>
Local AS: 4170512532
Age: 6:05
Validation State: unverified
Task: IS-IS
Announcement bits (1): 0-BGP_RT_Background
AS path: I
Color: 32768
Maximum bandwidth: 1000Mbps
Reservable bandwidth: 1000Mbps
Unreserved bandwidth by priority:
0 1000Mbps
1 1000Mbps
2 1000Mbps
3 1000Mbps
4 1000Mbps
5 1000Mbps
6 1000Mbps
7 1000Mbps
Metric: 10
TE Metric: 10
LAN IPV4 Adj-SID - Label: 299776, Flags: 0x30,
Weight: 0, Nbr: 10.220.1.83

PREFIX { Node { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 } {
IPv4:128.220.11.197/32 } ISIS-L1:0 }/1152 (1 entry, 1 announced) TSI: Page 0 idx
0, (group ibgp type Internal) Type 1 val 0xa62f43c (adv_entry)
Advertised metrics:
Nexthop: Self
Localpref: 100
AS path: [4170512532] I
Communities:
Path PREFIX { Node { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }
{ IPv4:128.220.11.197/32 } ISIS-L1:0 } Vector len 4. Val: 0
*IS-IS Preference: 15
Level: 1
Next hop type: Fictitious, Next hop index: 0
Address: 0x95dfc64
Next-hop reference count: 9
State:<Active NotInstall>

```

```

Local AS: 4170512532
Age: 6:05
Validation State: unverified
Task: IS-IS
Announcement bits (1): 0-BGP_RT_Background
AS path: I
Prefix SID: 67, Flags: 0x40, Algo: 0

```

show route table l2circuit.0

```

user@host> show route table l2circuit.0
l2circuit.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.1.1.195:NoCtrlWord:1:1:Local/96
    *[L2CKT/7] 00:50:47
    > via so-0/1/2.0, Push 100049
    > via so-0/1/3.0, Push 100049
10.1.1.195:NoCtrlWord:1:1:Remote/96
    *[LDP/9] 00:50:14
    Discard
10.1.1.195:CtrlWord:1:2:Local/96
    *[L2CKT/7] 00:50:47
    > via so-0/1/2.0, Push 100049
    > via so-0/1/3.0, Push 100049
10.1.1.195:CtrlWord:1:2:Remote/96
    *[LDP/9] 00:50:14
    Discard

```

show route table mpls

```

user@host> show route table mpls
mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0          *[MPLS/0] 00:13:55, metric 1
            Receive
1          *[MPLS/0] 00:13:55, metric 1
            Receive
2          *[MPLS/0] 00:13:55, metric 1
            Receive
1024       *[VPN/0] 00:04:18
            to table red.inet.0, Pop

```

show route table mpls extensive

```

user@host> show route table mpls extensive
100000 (1 entry, 1 announced)
TSI:
KRT in-kernel 100000 /36 -> {so-1/0/0.0}
    *LDP Preference: 9
    Next hop: via so-1/0/0.0, selected
    Pop
    State: <Active Int>
    Age: 29:50 Metric: 1
    Task: LDP
    Announcement bits (1): 0-KRT
    AS path: I
    Prefixes bound to route: 10.0.0.194/32

```

show route table mpls.0

```

user@host> show route table mpls.0
mpls.0: 18 destinations, 19 routes (18 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0                *[MPLS/0] 11:39:56, metric 1
                  to table inet.0
0(S=0)           *[MPLS/0] 11:39:56, metric 1
                  to table mpls.0
1                *[MPLS/0] 11:39:56, metric 1
                  Receive
2                *[MPLS/0] 11:39:56, metric 1
                  to table inet6.0
2(S=0)           *[MPLS/0] 11:39:56, metric 1
                  to table mpls.0
13               *[MPLS/0] 11:39:56, metric 1
                  Receive
303168           *[EVPN/7] 11:00:49, routing-instance pbbn10, route-type
Ingress-MAC, ISID 0
                  to table pbbn10.evpn-mac.0
303184           *[EVPN/7] 11:00:53, routing-instance pbbn10, route-type
Ingress-IM, ISID 1000
                  to table pbbn10.evpn-mac.0
                  [EVPN/7] 11:00:53, routing-instance pbbn10, route-type
Ingress-IM, ISID 2000
                  to table pbbn10.evpn-mac.0
303264           *[EVPN/7] 11:00:53, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-IM, ISID 1000
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303280           *[EVPN/7] 11:00:53, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-IM, ISID 2000
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303328           *[EVPN/7] 11:00:49, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303344           *[EVPN/7] 11:00:49, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303360           *[EVPN/7] 11:00:47, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:26:88:5f:67:b0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303376           *[EVPN/7] 11:00:47, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:51:51:51:51:51
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303392           *[EVPN/7] 11:00:35, remote-pe 100.100.100.3, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303408           *[EVPN/7] 11:00:35, remote-pe 100.100.100.3, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303424           *[EVPN/7] 11:00:33, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC a8:d0:e5:5b:01:c8
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303440           *[EVPN/7] 11:00:33, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:52:52:52:52:52
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2

```

show route table mpls.0 detail (PTX Series)

```

user@host> show route table mpls.0 detail
ge-0/0/2.600 (1 entry, 1 announced)
  *L2VPN Preference: 7
    Next hop type: Indirect
    Address: 0x9438f34
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 567
    Next hop: 10.0.0.1 via ge-0/0/1.0, selected
    Label operation: Push 299808
    Label TTL action: prop-ttl
    Load balance label: Label 299808:None;
    Session Id: 0x1
    Protocol next hop: 10.255.255.1
    Label operation: Push 299872 Offset: 252
    Label TTL action: no-prop-ttl
    Load balance label: Label 299872:Flow label PUSH;
    Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
    Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
    State: <Active Int>
    Age: 21 Metric2: 1
    Validation State: unverified
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 2-Common L2 VC
    AS path: I

```

show route table mpls.0 ccc ge-0/0/1.1004 detail

```

user@host> show route table mpls.0 ccc ge-0/0/1.1004 detail
mpls.0: 121 destinations, 121 routes (121 active, 0 holddown, 0 hidden)
ge-0/0/1.1004 (1 entry, 1 announced)
  *EVPN Preference: 7
    Next hop type: List, Next hop index: 1048577
    Address: 0xdc14770
    Next-hop reference count: 3
    Next hop: ELNH Address 0xd011e30
      Next hop type: Indirect, Next hop index: 0
      Address: 0xd011e30
      Next-hop reference count: 3
      Protocol next hop: 100.100.100.1
      Label operation: Push 301952
      Composite next hop: 0xd011dc0 754 INH Session ID: 0x146
      Indirect next hop: 0xb69a890 1048615 INH Session ID: 0x146
        Next hop type: Router, Next hop index: 735
        Address: 0xd00e530
        Next-hop reference count: 23
        Next hop: 100.46.1.2 via ge-0/0/5.0
        Label-switched-path pe4_to_pe1
        Label operation: Push 300320
        Label TTL action: prop-ttl
        Load balance label: Label 300320: None;
        Label element ptr: 0xd00e580
        Label parent element ptr: 0x0
        Label element references: 18
        Label element child references: 16
        Label element lsp id: 5
      Next hop: ELNH Address 0xd012070
        Next hop type: Indirect, Next hop index: 0
        Address: 0xd012070

```

```

Next-hop reference count: 3
Protocol next hop: 100.100.100.2
Label operation: Push 301888
Composite next hop: 0xd012000 755 INH Session ID: 0x143
Indirect next hop: 0xb69a9a0 1048641 INH Session ID: 0x143
  Next hop type: Router, Next hop index: 716
  Address: 0xd00e710
  Next-hop reference count: 23
  Next hop: 100.46.1.2 via ge-0/0/5.0
  Label-switched-path pe4_to_pe2
  Label operation: Push 300304
  Label TTL action: prop-ttl
  Load balance label: Label 300304: None;
  Label element ptr: 0xd00e760
  Label parent element ptr: 0x0
  Label element references: 15
  Label element child references: 13
  Label element lsp id: 6
Next hop: ELNH Address 0xd0121f0, selected
Next hop type: Indirect, Next hop index: 0
Address: 0xd0121f0
Next-hop reference count: 3
Protocol next hop: 100.100.100.3
Label operation: Push 301984
Composite next hop: 0xd012180 756 INH Session ID: 0x145
Indirect next hop: 0xb69aab0 1048642 INH Session ID: 0x145
  Next hop type: Router, Next hop index: 801
  Address: 0xd010ed0
  Next-hop reference count: 32
  Next hop: 100.46.1.2 via ge-0/0/5.0
  Label-switched-path pe4_to_pe3
  Label operation: Push 300336
  Label TTL action: prop-ttl
  Load balance label: Label 300336: None;
  Label element ptr: 0xd0108c0
  Label parent element ptr: 0x0
  Label element references: 22
  Label element child references: 20
  Label element lsp id: 7
State: < Active Int >
Age: 2:06:50
Validation State: unverified
Task: evpn global task
Announcement bits (1): 1-KRT
AS path: I

```

show route table mpls.0 protocol evpn

```

user@host>show route table mpls.0 protocol evpn
mpls.0: 121 destinations, 121 routes (121 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

299872          *[EVPN/7] 02:30:58, routing-instance mhevpn, route-type
Ingress-IM, vlan-id 10
                  to table mhevpn.evpn-mac.0
300016          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 110
                  to table VS-1.evpn-mac.0
300032          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 120
                  to table VS-1.evpn-mac.0

```



```

300048          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 130
                to table VS-1.evpn-mac.0
300064          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 210
                to table VS-2.evpn-mac.0
300080          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 220
                to table VS-2.evpn-mac.0
300096          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 230
                to table VS-2.evpn-mac.0
300112          *[EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300128          *[EVPN/7] 02:29:22, routing-instance mhevpn, route-type
Ingress-Aliasing
                to table mhevpn.evpn-mac.0
300144          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300160          *[EVPN/7] 02:29:22, routing-instance VS-1, route-type
Ingress-Aliasing
                to table VS-1.evpn-mac.0
300176          *[EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300192          *[EVPN/7] 02:29:22, routing-instance VS-2, route-type
Ingress-Aliasing
                to table VS-2.evpn-mac.0
300208          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300224          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300240          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300256          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300272          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300288          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300304          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300320          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11:11
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300336          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33:33
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

```

```

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300368 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300384 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300416 * [EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300432 * [EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300480 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300496 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300560 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300592 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300608 * [EVPN/7] 02:29:23
> via ge-0/0/1.1001, Pop
300624 * [EVPN/7] 02:29:23
> via ge-0/0/1.2001, Pop
301232 * [EVPN/7] 02:29:17
> via ge-0/0/1.1002, Pop
301296 * [EVPN/7] 02:29:10
> via ge-0/0/1.1003, Pop
301312 * [EVPN/7] 02:27:06
> via ae10.2003, Pop
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301360 * [EVPN/7] 02:29:01
> via ge-0/0/1.1004, Pop
301408 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
vpws1004, route-type Egress, vlan-id 2004
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301456 * [EVPN/7] 02:27:06
> via ae10.1010, Pop
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301552 * [EVPN/7] 02:27:07, routing-instance VS-1, route-type
Egress-MAC, ESI 00:22:22:22:22:22:22:22
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301568 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type

```

```

Egress-MAC, ESI 00:22:22:22:22:22:22:22:22
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301648    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
vpws1010, route-type Egress, vlan-id 2010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301664    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301680    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301696    *[EVPN/7] 02:27:07, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:22:22:22:22:22:22:22:22
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301712    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301728    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301744    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301760    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
vpws1010, route-type Egress, vlan-id 2010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301776    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301792    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301808    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
vpws1004, route-type Egress, vlan-id 2004
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301824    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301840    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1002, route-type Egress, vlan-id 2002
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301856    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1003, route-type Egress, vlan-id 2003
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301872    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1003, route-type Egress Protection, vlan-id 2003
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301888    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1010, route-type Egress Protection, vlan-id 1010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301904    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301920    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301936    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301952    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 230

```

```
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301968      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301984      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 220
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302000      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302016      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 210
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302032      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302048      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302064      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302080      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302096      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302112      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302128      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302144      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302160      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302176      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302192      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302208      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 130
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302224      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302240      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302256      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302272      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
```

```

302288          *[EVPN/7] 02:27:06, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302304          *[EVPN/7] 02:27:06, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302320          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302336          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302352          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
vpws1004, route-type Egress, vlan-id 2004
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302368          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302384          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-SH, vlan-id 10
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302400          *[EVPN/7] 02:26:21
> via ge-0/0/1.3001, Pop
302432          *[EVPN/7] 02:26:21, remote-pe 100.100.100.3, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302448          *[EVPN/7] 02:26:21, remote-pe 100.100.100.1, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302464          *[EVPN/7] 02:26:20, remote-pe 100.100.100.2, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302480          *[EVPN/7] 02:26:14
> via ge-0/0/1.3016, Pop
302512          *[EVPN/7] 02:26:14, remote-pe 100.100.100.1, routing-instance
vpws3016, route-type Egress, vlan-id 40016
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302528          *[EVPN/7] 02:26:14, remote-pe 100.100.100.2, routing-instance
vpws3016, route-type Egress, vlan-id 40016
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302560          *[EVPN/7] 02:26:06
> via ae10.3011, Pop
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302592          *[EVPN/7] 02:26:07, remote-pe 100.100.100.1, routing-instance
vpws3011, route-type Egress, vlan-id 401100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302608          *[EVPN/7] 02:26:07, remote-pe 100.100.100.2, routing-instance
vpws3011, route-type Egress, vlan-id 401100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302624          *[EVPN/7] 02:26:07, remote-pe 100.100.100.3, routing-instance
vpws3011, route-type Egress Protection, vlan-id 301100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302656          *[EVPN/7] 02:25:59
> via ae10.3006, Pop
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302688          *[EVPN/7] 02:26:00, remote-pe 100.100.100.2, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302704          *[EVPN/7] 02:26:00, remote-pe 100.100.100.1, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

```

```

302720          *[EVPN/7] 02:25:59, remote-pe 100.100.100.3, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302736          *[EVPN/7] 02:25:59, remote-pe 100.100.100.3, routing-instance
vpws3006, route-type Egress Protection, vlan-id 300600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ge-0/0/1.1001    *[EVPN/7] 02:29:23
> via ge-0/0/1.2001
ge-0/0/1.2001    *[EVPN/7] 02:29:23
> via ge-0/0/1.1001
ge-0/0/1.1002    *[EVPN/7] 02:27:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ae10.2003        *[EVPN/7] 02:29:10
> via ge-0/0/1.1003
ge-0/0/1.1003    *[EVPN/7] 02:27:06
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3

> via ae10.2003
ge-0/0/1.1004    *[EVPN/7] 02:27:06
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ae10.1010        *[EVPN/7] 02:27:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ge-0/0/1.3001    *[EVPN/7] 02:26:20
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ge-0/0/1.3016    *[EVPN/7] 02:26:13
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ae10.3011        *[EVPN/7] 02:26:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ae10.3006        *[EVPN/7] 02:25:59
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3

```

show route table mpls.0 protocol ospf

```

user@host> show route table mpls.0 protocol ospf
mpls.0: 29 destinations, 29 routes (29 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

299952          *[L-OSPF/10] 23:59:42, metric 0
> to 10.0.10.70 via lt-1/2/0.14, Pop
to 10.0.6.60 via lt-1/2/0.12, Swap 800070, Push 800030(top)
299952(S=0)     *[L-OSPF/10] 23:59:42, metric 0
> to 10.0.10.70 via lt-1/2/0.14, Pop
to 10.0.6.60 via lt-1/2/0.12, Swap 800070, Push 800030(top)
299968          *[L-OSPF/10] 23:59:48, metric 0
> to 10.0.6.60 via lt-1/2/0.12, Pop

```

show route table mpls.0 extensive (PTX Series)

```

user@host> show route table mpls.0 extensive
ge-0/0/2.600 (1 entry, 1 announced)
TSI:
KRT in-kernel ge-0/0/2.600.0      /32 -> {composite(570)}
  *L2VPN Preference: 7
    Next hop type: Indirect
    Address: 0x9438f34
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 567
    Next hop: 10.0.0.1 via ge-0/0/1.0, selected
    Label operation: Push 299808
    Label TTL action: prop-ttl
    Load balance label: Label 299808:None;
    Session Id: 0x1
    Protocol next hop: 10.255.255.1
    Label operation: Push 299872 Offset: 252
    Label TTL action: no-prop-ttl
    Load balance label: Label 299872:Flow label PUSH;
    Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
    Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
    State: <Active Int>
    Age: 47      Metric2: 1
    Validation State: unverified
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 2-Common L2 VC
    AS path: I
    Composite next hops: 1
      Protocol next hop: 10.255.255.1 Metric: 1
      Label operation: Push 299872 Offset: 252
      Label TTL action: no-prop-ttl
      Load balance label: Label 299872:Flow label PUSH;
      Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
      Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
      Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.0.0.1 via ge-0/0/1.0
        Session Id: 0x1
      10.255.255.1/32 Originating RIB: inet.3
        Metric: 1      Node path count: 1
        Forwarding nexthops: 1
          Nexthop: 10.0.0.1 via ge-0/0/1.0

```

show route table mpls.0 (RSVP Route—Transit LSP)

```

user@host> show route table mpls.0

mpls.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0          * [MPLS/0] 00:37:31, metric 1
           Receive
1          * [MPLS/0] 00:37:31, metric 1
           Receive
2          * [MPLS/0] 00:37:31, metric 1
           Receive
13         * [MPLS/0] 00:37:31, metric 1
           Receive
300352     * [RSVP/7/1] 00:08:00, metric 1

```

```

300352(S=0)      > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
                  *[RSVP/7/1] 00:08:00, metric 1
300384           > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
                  *[RSVP/7/2] 00:05:20, metric 1
                  > to 10.64.1.106 via ge-1/0/0.0, Pop
300384(S=0)      *[RSVP/7/2] 00:05:20, metric 1
                  > to 10.64.1.106 via ge-1/0/0.0, Pop

```

show route table vpls_1 detail

```

user@host> show route table vpls_1 detail
vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

172.16.1.11:1000:1:1/96 (1 entry, 1 announced)
*L2VPN Preference: 170/-1
Receive table: vpls_1.l2vpn.0
Next-hop reference count: 2
State: <Active Int Ext>
Age: 4:29:47 Metric2: 1
Task: vpls_1-l2vpn
Announcement bits (1): 1-BGP.0.0.0.0+179
AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down
Label-base: 800000, range: 8, status-vector: 0xFF

```

show route table vpn-a

```

user@host> show route table vpn-a
vpn-a.l2vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

+ = Active Route, - = Last Active, * = Both
192.168.16.1:1:1:1/96
    *[VPN/7] 05:48:27
    Discard
192.168.24.1:1:2:1/96
    *[BGP/170] 00:02:53, localpref 100, from 192.168.24.1
    AS path: I
    > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am
192.168.24.1:1:3:1/96
    *[BGP/170] 00:02:53, localpref 100, from 192.168.24.1
    AS path: I
    > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am

```

show route table vpn-a.mdt.0

```

user@host> show route table vpn-a.mdt.0
vpn-a.mdt.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:1:0:10.255.14.216:232.1.1.1/144
    *[MVPN/70] 01:23:05, metric2 1
    Indirect
1:1:1:10.255.14.218:232.1.1.1/144
    *[BGP/170] 00:57:49, localpref 100, from 10.255.14.218
    AS path: I
    > via so-0/0/0.0, label-switched-path r0e-to-r1
1:1:2:10.255.14.217:232.1.1.1/144
    *[BGP/170] 00:57:49, localpref 100, from 10.255.14.217

```



```

AS path: I
> via so-0/0/1.0, label-switched-path r0-to-r2

```

show route table VPN-A detail

```

user@host> show route table VPN-A detail
VPN-AB.inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
10.255.179.9/32 (1 entry, 1 announced)
    *BGP      Preference: 170/-101
                Route Distinguisher: 10.255.179.13:200
                Next hop type: Indirect
                Next-hop reference count: 5
                Source: 10.255.179.13
                Next hop type: Router, Next hop index: 732
                Next hop: 10.39.1.14 via fe-0/3/0.0, selected
                Label operation: Push 299824, Push 299824(top)
                Protocol next hop: 10.255.179.13
                Push 299824
                Indirect next hop: 8f275a0 1048574
                State: (Secondary Active Int Ext)
                Local AS: 1 Peer AS: 1
                Age: 3:41:06 Metric: 1 Metric2: 1
                Task: BGP_1.10.255.179.13+64309
                Announcement bits (2): 0-KRT 1-BGP RT Background
                AS path: I
                Communities: target:1:200 rte-type:0.0.0.0:1:0
                Import Accepted
                VPN Label: 299824 TTL Action: vrf-ttl-propagate
                Localpref: 100
                Router ID: 10.255.179.13
                Primary Routing Table bgp.13vpn.0

```

show route table VPN-AB.inet.0

```

user@host> show route table VPN-AB.inet.0
VPN-AB.inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.0/30      *[OSPF/10] 00:07:24, metric 1
> via so-7/3/1.0
10.39.1.4/30      *[Direct/0] 00:08:42
> via so-5/1/0.0
10.39.1.6/32      *[Local/0] 00:08:46
Local
10.255.71.16/32   *[Static/5] 00:07:24
> via so-2/0/0.0
10.255.71.17/32   *[BGP/170] 00:07:24, MED 1, localpref 100, from
10.255.71.15
AS path: I
> via so-2/1/0.0, Push 100020, Push 100011(top)
10.255.71.18/32   *[BGP/170] 00:07:24, MED 1, localpref 100, from
10.255.71.15
AS path: I
> via so-2/1/0.0, Push 100021, Push 100011(top)
10.255.245.245/32 *[BGP/170] 00:08:35, localpref 100
AS path: 2 I
> to 10.39.1.5 via so-5/1/0.0
10.255.245.246/32 *[OSPF/10] 00:07:24, metric 1
> via so-7/3/1.0

```

show route table VPN_blue.mvpn-inet6.0

```

user@host> show route table VPN_blue.mvpn-inet6.0
vpn_blue.mvpn-inet6.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:10.255.2.202:65536:10.255.2.202/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.202
    AS path: I
    > via so-0/1/3.0
1:10.255.2.203:65536:10.255.2.203/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.203
    AS path: I
    > via so-0/1/0.0
1:10.255.2.204:65536:10.255.2.204/432
    *[MVPN/70] 00:57:23, metric2 1
    Indirect
5:10.255.2.202:65536:128:::192.168.90.2:128:ffff::1/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.202
    AS path: I
    > via so-0/1/3.0
6:10.255.2.203:65536:64500:128:::10.12.53.12:128:ffff::1/432
    *[PIM/105] 00:02:37
    Multicast (IPv6)
7:10.255.2.202:65536:64500:128:::192.168.90.2:128:ffff::1/432
    *[MVPN/70] 00:02:37, metric2 1
    Indirect

```

show route table vrf1.mvpn.0 extensive

```

user@host> show route table vrf1.mvpn.0 extensive
1:10.255.50.77:1:10.255.50.77/240 (1 entry, 1 announced)
    *MVPN Preference: 70
    PMSI: Flags 0x0: Label 0: RSVP-TE:
Session_13[10.255.50.77:0:25624:10.255.50.77]
    Next hop type: Indirect
    Address: 0xbb2c944
    Next-hop reference count: 360
    Protocol next hop: 10.255.50.77
    Indirect next hop: 0x0 - INH Session ID: 0x0
    State: <Active Int Ext>
    Age: 53:03 Metric2: 1
    Validation State: unverified
    Task: mvpn global task
    Announcement bits (3): 0-PIM.vrf1 1-mvpn global task 2-rt-export

    AS path: I

```

show route table inetflow detail

```

user@host> show route table inetflow detail
inetflow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.12.44.1,*/48 (1 entry, 1 announced)
    *BGP Preference: 170/-101
    Next-hop reference count: 2
    State: <Active Ext>
    Local AS: 64502 Peer AS: 64500
    Age: 4
    Task: BGP_64500.10.12.99.5+3792
    Announcement bits (1): 0-Flow

```

```

AS path: 64500 I
Communities: traffic-rate:0:0
Validation state: Accept, Originator: 10.12.99.5
Via: 10.12.44.0/24, Active
Localpref: 100
Router ID: 10.255.71.161

10.12.56.1,*/48 (1 entry, 1 announced)
*Flow Preference: 5
Next-hop reference count: 2
State: <Active>
Local AS: 64502
Age: 6:30
Task: RT Flow
Announcement bits (2): 0-Flow 1-BGP.0.0.0+179
AS path: I
Communities: 1:1

user@host> show route table green.l2vpn.0 (VPLS Multihoming with FEC 129)
green.l2vpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.1.1.2:100:10.1.1.2/96 AD
    *[VPLS/170] 1d 03:11:03, metric2 1
    Indirect
10.1.1.4:100:10.1.1.4/96 AD
    *[BGP/170] 1d 03:11:02, localpref 100, from 10.1.1.4
    AS path: I, validation-state: unverified
    > via ge-1/2/1.5
10.1.1.2:100:1:0/96 MH
    *[VPLS/170] 1d 03:11:03, metric2 1
    Indirect
10.1.1.4:100:1:0/96 MH
    *[BGP/170] 1d 03:11:02, localpref 100, from 10.1.1.4
    AS path: I, validation-state: unverified
    > via ge-1/2/1.5
10.1.1.4:NoCtrlWord:5:100:100:10.1.1.2:10.1.1.4/176
    *[VPLS/7] 1d 03:11:02, metric2 1
    > via ge-1/2/1.5
10.1.1.4:NoCtrlWord:5:100:100:10.1.1.4:10.1.1.2/176
    *[LDP/9] 1d 03:11:02
    Discard

user@host> show route table red extensive
red.inet.0: 364481 destinations, 714087 routes (364480 active, 48448 holddown, 1
hidden)
10.0.0.0/32 (3 entries, 1 announced)
    State: <OnList CalcForwarding>
TSI:
KRT in-kerne1 10.0.0.0/32 -> {composite(1048575)} Page 0 idx 1 Type 1 val 0x934342c

    Nexthop: Self
    AS path: [2] I
    Communities: target:2:1
Path 10.0.0.0 from 10.3.0.0 Vector len 4. Val: 1
    @BGP Preference: 170/-1
    Route Distinguisher: 2:1
    Next hop type: Indirect
    Address: 0x258059e4
    Next-hop reference count: 2

```

```

Source: 2.2.0.0
Next hop type: Router
Next hop: 10.1.1.1 via ge-1/1/9.0, selected
Label operation: Push 707633
Label TTL action: prop-ttl
Session Id: 0x17d8
Protocol next hop: 10.2.0.0
Push 16
Composite next hop: 0x25805988 - INH Session ID: 0x193c
Indirect next hop: 0x23eea900 - INH Session ID: 0x193c
State: <Secondary Active Int Ext ProtectionPath ProtectionCand>
Local AS:      2 Peer AS:      2
Age: 23        Metric2: 35
Validation State: unverified
Task: BGP_172.16.2.0.0+34549
AS path: I
Communities: target:2:1
Import Accepted
VPN Label: 16
Localpref: 0
Router ID: 10.2.0.0
Primary Routing Table bgp.13vpn.0
Composite next hops: 1
  Protocol next hop: 10.2.0.0 Metric: 35
  Push 16
  Composite next hop: 0x25805988 - INH Session ID: 0x193c
  Indirect next hop: 0x23eea900 - INH Session ID: 0x193c
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.1.1.1 via ge-1/1/9.0
    Session Id: 0x17d8
  2.2.0.0/32 Originating RIB: inet.3
    Metric: 35                      Node path count: 1
    Forwarding nexthops: 1
      Nexthop: 10.1.1.1 via ge-1/1/9.0
BGP Preference: 170/-1
Route Distinguisher: 2:1
Next hop type: Indirect
Address: 0x9347028
Next-hop reference count: 3
Source: 10.3.0.0
Next hop type: Router, Next hop index: 702
Next hop: 10.1.4.2 via ge-1/0/0.0, selected
Label operation: Push 634278
Label TTL action: prop-ttl
Session Id: 0x17d9
Protocol next hop: 10.3.0.0
Push 16
Composite next hop: 0x93463a0 1048575 INH Session ID: 0x17da
Indirect next hop: 0x91e8800 1048574 INH Session ID: 0x17da
State: <Secondary NotBest Int Ext ProtectionPath ProtectionCand>

Inactive reason: Not Best in its group - IGP metric
Local AS:      2 Peer AS:      2
Age: 3:34      Metric2: 70
Validation State: unverified
Task: BGP_172.16.3.0.0+32805
Announcement bits (2): 0-KRT 1-BGP_RT_Background
AS path: I
Communities: target:2:1
Import Accepted

```

```

VPN Label: 16
Localpref: 0
Router ID: 10.3.0.0
Primary Routing Table bgp.13vpn.0
Composite next hops: 1
    Protocol next hop: 10.3.0.0 Metric: 70
    Push 16
    Composite next hop: 0x93463a0 1048575 INH Session ID:
0x17da
    Indirect next hop: 0x91e8800 1048574 INH Session ID:
0x17da
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.1.4.2 via ge-1/0/0.0
        Session Id: 0x17d9
    10.3.0.0/32 Originating RIB: inet.3
        Metric: 70
        Node path count: 1
        Forwarding nexthops: 1
            Nexthop: 10.1.4.2 via ge-1/0/0.0
#Multipath Preference: 255
    Next hop type: Indirect
    Address: 0x24afca30
    Next-hop reference count: 1
    Next hop type: Router
    Next hop: 10.1.1.1 via ge-1/1/9.0, selected
    Label operation: Push 707633
    Label TTL action: prop-ttl
    Session Id: 0x17d8
    Next hop type: Router, Next hop index: 702
    Next hop: 10.1.4.2 via ge-1/0/0.0
    Label operation: Push 634278
    Label TTL action: prop-ttl
    Session Id: 0x17d9
    Protocol next hop: 10.2.0.0
    Push 16
    Composite next hop: 0x25805988 - INH Session ID: 0x193c
    Indirect next hop: 0x23eea900 - INH Session ID: 0x193c Weight 0x1

    Protocol next hop: 10.3.0.0
    Push 16
    Composite next hop: 0x93463a0 1048575 INH Session ID: 0x17da
    Indirect next hop: 0x91e8800 1048574 INH Session ID: 0x17da Weight
0x4000
    State: <ForwardingOnly Int Ext>
    Inactive reason: Forwarding use only
    Age: 23
    Metric2: 35
    Validation State: unverified
    Task: RT
    AS path: I
    Communities: target:2:1

```

show route table bgp.evpn.0 extensive [no-more (EVPN)]

```

show route table bgp.evpn.0 extensive | no-more
bgp.evpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
2:1000:10::100::00:aa:aa:aa:aa:aa/304 (1 entry, 0 announced)
    *BGP
    Preference: 170/-101
    Route Distinguisher: 1000:10
    Next hop type: Indirect
    Address: 0x9420fd0
    Next-hop reference count: 12

```

```

Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS:17 Age:21:12 Metric2:1 Validation State:
unverified
Task: BGP_17.1.2.3.4+50756
AS path: I
Communities: target:1111:8388708 encapsulation0:0:0:0:3
Import Accepted
Route Label: 100
ESI: 00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  1.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

2:1000:10::200::00:bb:bb:bb:bb:bb/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:19:43 Metric2:1 Validation
State:unverified
Task: BGP_17.1.2.3.4+50756
AS path: I
Communities: target:2222:22 encapsulation0:0:0:0:3
Import Accepted
Route Label: 200
ESI: 00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

2:1000:10::300::00:cc:cc:cc:cc:cc/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10

```

```

Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:17:21 Metric2:1 Validation State:
unverified Task: BGP 17,1,2,3,4+50756
AS path: I
Communities: target:3333:33 encapsulation0:0:0:0:3
Import Accepted
Route Label: 300
ESI: 00:00:00:00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

3:1000:10::100::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
PMSI: Flags 0x0: Label 100: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:37:01 Metric2:1 Validation State:
unverified Task: BGP 17.1.2.3.4+50756
AS path: I
Communities: target:1111:8388708 encapsulation0:0:0:0:3
Import Accepted
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

3:1000:10::200::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10

```

```

PMSI: Flags 0x0: Label 200: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS: 17 Age:35:22 Metric2:1 Validation
State:unverified Task: BGP 17.1.2.3.4+50756
AS path:I Communities: target:2222:22 encapsulation):0:0:0:0:3

Import Accepted
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
    Protocol next hop: 10.2.3.4 Metric: 1
    Indirect next hop: 0x2 no-forward INH Session ID: 0x0
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.10.10.1 via xe-0/0/1.0
        Session Id: 0x2
    10.2.3.4/32 Originating RIB: inet.0
        Metric: 1 Node path count: 1
        Forwarding nexthops: 2
        Nexthop: 10.92.78.102 via em0.0

3:1000:10::300::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
PMSI: Flags 0x0: Label 300: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS: 17 Age 35:22 Metric2:1 Validation State:
unverified Task: BGP 17.1.2.3.4+5075
6 AS path: I Communities: target:3333:33 encapsulation0:0:0:0:3
Import Accepted Localpref:100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
    Protocol next hop: 10.2.3.4 Metric: 1
    Indirect next hop: 0x2 no-forward INH Session ID: 0x0
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.10.10.1 via xe-0/0/1.0
        Session Id: 0x2
    10.2.3.4/32 Originating RIB: inet.0
        Metric: 1 Node path count: 1
        Forwarding nexthops: 2
        Nexthop: 10.92.78.102 via em0.0

```


show route terse

List of Syntax [Syntax on page 461](#)
[Syntax \(EX Series Switches\) on page 461](#)

Syntax show route terse
 <logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches) show route terse

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display a high-level summary of the routes in the routing table.



NOTE: For BGP routes, the `show route terse` command displays the local preference attribute and MED instead of the metric1 and metric2 values. This is mostly due to historical reasons.

To display the metric1 and metric2 value of a BGP route, use the [show route extensive](#) command.

Options **none**—Display a high-level summary of the routes in the routing table.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level view

List of Sample Output [show route terse on page 463](#)

Output Fields [Table 32 on page 461](#) describes the output fields for the `show route terse` command. Output fields are listed in the approximate order in which they appear.

Table 32: show route terse Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 32: show route terse Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route key</i>	Key for the state of the route: <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route.
A	Active route. An asterisk (*) indicates this is the active route.
V	Validation status of the route: <ul style="list-style-type: none"> • ?—Not evaluated. Indicates that the route was not learned through BGP. • I—Invalid. Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • N—Unknown. Indicates that the prefix is not among the prefixes or prefix ranges in the database. • V—Valid. Indicates that the prefix and autonomous system pair are found in the database.
Destination	Destination of the route.
P	Protocol through which the route was learned: <ul style="list-style-type: none"> • A—Aggregate • B—BGP • C—CCC • D—Direct • G—GMPLS • I—IS-IS • L—L2CKT, L2VPN, LDP, Local • K—Kernel • M—MPLS, MSDP • O—OSPF • P—PIM • R—RIP, RIPng • S—Static • T—Tunnel
Prf	Preference value of the route. In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.

Table 32: show route terse Output Fields (*continued*)

Field Name	Field Description
Metric 1	First metric value in the route. For routes learned from BGP, this is the MED metric.
Metric 2	Second metric value in the route. For routes learned from BGP, this is the IGP metric.
Next hop	Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> I—IGP. E—EGP. ?—Incomplete; typically, the AS path was aggregated.

Sample Output

show route terse

```

user@host> show route terse
inet.0: 10 destinations, 12 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A V Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* ? 172.16.1.1/32    0 10      1          >10.0.0.2      I
?                                     >10.0.0.2
  unverified
* ? 172.16.1.1/32    D 0          >10.0.0.2      200 I
* V 2.2.0.2/32       B 170     110          >10.0.0.2
  valid
* ? 10.0.0.0/30      D 0          >1t-1/2/0.1    I
?                                     >10.0.0.2
  unverified
* ? 10.0.0.1/32      L 0          Local          I
* ? 10.0.0.4/30      B 170     100          >10.0.0.2
  unverified
* ? 10.0.0.8/30      B 170     100          >10.0.0.2
  unverified
* I 172.16.1.1/32    B 170      90          >10.0.0.2      200 I
  invalid
* N 192.168.2.3/32   B 170     100          >10.0.0.2      200 I
  unknown
* ? 172.16.233.5/32  0 10      1          >10.0.0.2      MultiRecv

```

test policy

Syntax `test policy policy-name prefix`

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Test a policy configuration to determine which prefixes match routes in the routing table.



NOTE: If you are using the `test policy` command on a logical system, you must first set the CLI to the logical system context. For example, if you want to test a routing policy that is configured on logical system R2, first run the `set cli logical-system R2` command.

Options *policy-name*—Name of a policy.
prefix—Destination prefix to match.

Additional Information All prefixes in the default unicast routing table (inet.0) that match prefixes that are the same as or longer than the specific prefix are processed by the **from** clause in the specified policy. All prefixes accepted by the policy are displayed. The **test policy** command evaluates a policy differently from the BGP import process. When testing a policy that contains an **interface** match condition in the **from** clause, the **test policy** command uses the match condition. In contrast, BGP does not use the **interface** match condition when evaluating the policy against routes learned from internal BGP (IBGP) or external BGP (EGBP) multihop peers.

When testing a policy, you can see the length of time (in microseconds) required to evaluate the policy and the number of times it has been executed by running the `show policy policy-name statistics` command.

Required Privilege Level view

Related Documentation

- [Understanding Routing Policy Tests](#)
- [Example: Testing a Routing Policy with Complex Regular Expressions on page 137](#)
- [show policy on page 262](#)

List of Sample Output [test policy on page 465](#)

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

test policy

```
user@host> test policy test-statics 172.16.0.1/8
inet.0: 44 destinations, 44 routes (44 active, 0 holddown, 0 hidden)
Prefixes passing policy:

172.16.3.0/8      *[BGP/170] 16:22:46, localpref 100, from 10.255.255.41
                  AS Path: 50888 I
                  > to 10.11.4.32 via en0.2, label-switched-path l2
172.16.3.1/32    *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                  > to 10.0.4.7 via fxp0.0
172.16.3.2/32    *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                  > to 10.0.4.7 via fxp0.0
172.16.3.3/32    *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                  > to 10.0.4.7 via fxp0.0
172.16.3.4/32    *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                  > to 10.0.4.7 via fxp0.0
Policy test-statics: 5 prefixes accepted, 0 prefixes rejected
```


CHAPTER 23

RIPng Operational Commands

- clear ripng general-statistics
- clear ripng statistics
- restart
- show policy
- show policy conditions
- show ripng general-statistics
- show ripng neighbor
- show ripng statistics
- show route
- show route active-path
- show route advertising-protocol
- show route all
- show route best
- show route brief
- show route detail
- show route exact
- show route export
- show route extensive
- show route forwarding-table
- show route hidden
- show route inactive-path
- show route instance
- show route next-hop
- show route output
- show route protocol
- show route receive-protocol
- show route table

- `show route terse`
- `test policy`

clear ripng general-statistics

List of Syntax	Syntax on page 469 Syntax (EX Series Switches) on page 469
Syntax	clear ripng general-statistics <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switches)	clear ripng general-statistics
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Clear RIP next generation (RIPng) general statistics.
Options	none —Clear RIPng general statistics. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show ripng general-statistics on page 486
List of Sample Output	clear ripng general-statistics on page 469
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear ripng general-statistics

```
user@host> clear ripng general-statistics
```

clear ripng statistics

List of Syntax	Syntax on page 470 Syntax (EX Series Switch) on page 470
Syntax	clear ripng statistics < <i>instance</i> <i>name</i> > <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switch)	clear ripng statistics < <i>instance</i> <i>name</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Clear RIP next-generation (RIPng) statistics.
Options	none —Reset RIPng counters for all neighbors for all routing instances. instance —(Optional) Reset RIPng counters for the specified instance. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. name —(Optional) Reset RIPng counters for the specified neighbor.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show ripng statistics on page 490
List of Sample Output	clear ripng statistics on page 470
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear ripng statistics

```
user@host> clear ripng statistics
```

restart

- List of Syntax**
- Syntax on page 471
 - Syntax (ACX Series Routers) on page 471
 - Syntax (EX Series Switches) on page 471
 - Syntax (MX Series Routers) on page 472
 - Syntax (QFX Series) on page 472
 - Syntax (Routing Matrix) on page 472
 - Syntax (TX Matrix Routers) on page 472
 - Syntax (TX Matrix Plus Routers) on page 473
 - Syntax (QFX Series) on page 473

Syntax restart

```
<adaptive-services | ancpd-service | application-identification | audit-process |
auto-configuration | captive-portal-content-delivery | ce-l2tp-service | chassis-control |
class-of-service | clksyncd-service | database-replication | datapath-trace-service
| dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
ecc-error-logging | ethernet-connectivity-fault-management
| ethernet-link-fault-management | event-processing | firewall
| general-authentication-service | gracefully | iccp-service | idp-policy | immediately
| interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
| l2tp-service | l2tp-universal-edge | lacp | license-service | link-management
| local-policy-decision-function | mac-validation | mib-process | mounstd-service
| mpls-traceroute | mspd | multicast-snooping | named-service | nfsd-service |
packet-triggered-subscribers | peer-selection-service | pgm | pic-services-logging | pki-service
| ppp | ppp-service | pppoe | protected-system-domain-service |
redundancy-interface-process | remote-operations | root-system-domain-service | routing
<logical-system logical-system-name> | sampling | sbc-configuration-process | sdk-service
| service-deployment | services | snmp | soft | static-subscribers | statistics-service |
subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control |
vrrp | web-management>
<gracefully | immediately | soft>
```

Syntax (ACX Series Routers) restart

```
<adaptive-services | audit-process | auto-configuration | autoinstallation | chassis-control |
class-of-service | clksyncd-service | database-replication | dhcp-service | diameter-service
| disk-monitoring | dynamic-flow-capture | ethernet-connectivity-fault-management
| ethernet-link-fault-management | event-processing | firewall
| general-authentication-service | gracefully | immediately | interface-control |
ipsec-key-management | l2-learning | lacp | link-management | mib-process | mounstd-service
| mpls-traceroute | mspd | named-service | nfsd-service | pgm | pki-service | ppp | pppoe |
redundancy-interface-process | remote-operations | routing | sampling | sdk-service
| secure-neighbor-discovery | service-deployment | services | snmp | soft | statistics-service |
subscriber-management | subscriber-management-helper | tunnel-oamd | vrrp>
```

Syntax (EX Series Switches) restart

```
<autoinstallation | chassis-control | class-of-service | database-replication | dhcp |
dhcp-service | diameter-service | dot1x-protocol | ethernet-link-fault-management |
ethernet-switching | event-processing | firewall | general-authentication-service |
interface-control | kernel-replication | l2-learning | lacp | license-service | link-management
| lldpd-service | mib-process | mounstd-service | multicast-snooping | pgm |
```

redundancy-interface-process | remote-operations | routing | secure-neighbor-discovery
| service-deployment | sflow-service | snmp | vrrp | web-management>

**Syntax (MX Series
Routers)**

restart
<adaptive-services | ancpd-service | application-identification | audit-process |
auto-configuration | captive-portal-content-delivery | ce-l2tp-service | chassis-control |
class-of-service | clksyncd-service | database-replication | datapath-trace-service
| dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
ecc-error-logging | ethernet-connectivity-fault-management
| ethernet-link-fault-management | event-processing | firewall |
general-authentication-service | gracefully | iccp-service | idp-policy | immediately
| interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
| l2tp-service | l2tp-universal-edge | lacp | license-service | link-management
| local-policy-decision-function | mac-validation | mib-process | mounstd-service
| mpls-traceroute | mspd | multicast-snooping | named-service | nfsd-service |
packet-triggered-subscribers | peer-selection-service | pgm | pic-services-logging |
pki-service | ppp | ppp-service | pppoe | protected-system-domain-service |
redundancy-interface-process | remote-operations | root-system-domain-service | routing
| routing <logical-system *logical-system-name*> | sampling | sbc-configuration-process |
sdk-service | service-deployment | services | snmp | soft | static-subscribers | statistics-service |
subscriber-management | subscriber-management-helper | tunnel-oamd | usb-control |
vrrp | web-management>
<all-members>
<gracefully | immediately | soft>
<local>
<member *member-id*>

Syntax (QFX Series)

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
diameter-service | dlsd | ethernet-connectivity | event-processing | fibre-channel | firewall
| general-authentication-service | igmp-host-services | interface-control |
ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
redundancy-interface-process | remote-operations | *logical-system-name*> | routing |
sampling | secure-neighbor-discovery | service-deployment | snmp | usb-control |
web-management>
<gracefully | immediately | soft>

**Syntax (Routing
Matrix)**

restart
<adaptive-services | audit-process | chassis-control | class-of-service | disk-monitoring |
dynamic-flow-capture | ecc-error-logging | event-processing | firewall | interface-control
| ipsec-key-management | kernel-replication | l2-learning | l2tp-service | lacp |
link-management | mib-process | pgm | pic-services-logging | ppp | pppoe |
redundancy-interface-process | remote-operations | routing <logical-system
logical-system-name> | sampling | service-deployment | snmp>
<all | all-lcc | lcc *number*>
<gracefully | immediately | soft>

**Syntax (TX Matrix
Routers)**

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
| l2-learning | l2tp-service | lacp | link-management | mib-process | pgm | pic-services-logging

```

| ppp | pppoe | redundancy-interface-process | remote-operations | routing <logical-system
logical-system-name> | sampling | service-deployment | snmp | statistics-service>
<all-chassis | all-lcc | lcc number | scc>
<gracefully | immediately | soft>

```

Syntax (TX Matrix Plus Routers)

```

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
| l2-learning | l2tp-service | lacp | link-management | mib-process | pgm |
pic-services-logging | ppp | pppoe | redundancy-interface-process | remote-operations |
routing <logical-system logical-system-name> | sampling | service-deployment | snmp |
statistics-service>
<all-chassis | all-lcc | all-sfc | lcc number | sfc number>
<gracefully | immediately | soft>

```

Syntax (QFX Series)

```

restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
diameter-service | dlsf | ethernet-connectivity | event-processing | fibre-channel | firewall
| general-authentication-service | igmp-host-services | interface-control |
ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
redundancy-interface-process | remote-operations |logical-system-name> | routing |
sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control |
web-management>
<gracefully | immediately | soft>

```

Release Information

Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Command introduced in Junos OS Release 12.2 for ACX Series routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Options added:

- **dynamic-flow-capture** in Junos OS Release 7.4.
- **dlsf** in Junos OS Release 7.5.
- **event-processing** in Junos OS Release 7.5.
- **ppp** in Junos OS Release 7.5.
- **l2ald** in Junos OS Release 8.0.
- **link-management** in Release 8.0.
- **pgcp-service** in Junos OS Release 8.4.
- **sbcc-configuration-process** in Junos OS Release 9.5.
- **services pgcp gateway** in Junos OS Release 9.6.
- **sfc** and **all-sfc** for the TX Matrix Router in Junos OS Release 9.6.

Description Restart a Junos OS process.



CAUTION: Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router or switch to drop calls and interrupt transmission, resulting in possible loss of data.

Options **none**—Same as **gracefully**.

adaptive-services—(Optional) Restart the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Restart the software process on all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process on all T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process on all T1600 routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Restart the software process for all members of the Virtual Chassis configuration.

all-sfc—(TX Matrix Plus routers only) (Optional) For a TX Matrix Plus router, restart the software processes for the TX Matrix Plus router (or switch-fabric chassis).

ancpd-service—(Optional) Restart the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

application-identification—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based on the amount of time or type of services accessed.

auto-configuration—(Optional) Restart the Interface Auto-Configuration process.

autoinstallation—(EX Series switches only) (Optional) Restart the autoinstallation process.

captive-portal-content-delivery—(Optional) Restart the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

chassis-control—(Optional) Restart the chassis management process.

class-of-service—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

clksyncd-service—(Optional) Restart the external clock synchronization process, which uses synchronous Ethernet (SyncE).

database-replication—(EX Series switches and MX Series routers only) (Optional) Restart the database replication process.

datalpath-trace-service—(Optional) Restart the packet path tracing process.

dhcp—(EX Series switches only) (Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.

dhcp-service—(Optional) Restart the Dynamic Host Configuration Protocol process.

dialer-services—(EX Series switches only) (Optional) Restart the ISDN dial-out process.

diameter-service—(Optional) Restart the diameter process.

disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

dls—(QFX Series only) (Optional) Restart the data link switching (DLSw) service.

dot1x-protocol—(EX Series switches only) (Optional) Restart the port-based network access control process.

dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

ecc-error-logging—(Optional) Restart the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

ethernet-switching—(EX Series switches only) (Optional) Restart the Ethernet switching process.

event-processing—(Optional) Restart the event process (eventd).

fibre-channel—(QFX Series only) (Optional) Restart the Fibre Channel process.

firewall—(Optional) Restart the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Restart the general authentication process.

gracefully—(Optional) Restart the software process.

iccp-service—(Optional) Restart the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.

immediately—(Optional) Immediately restart the software process.

interface-control—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

ipsec-key-management—(Optional) Restart the IPsec key management process.

isdn-signaling—(QFX Series only) (Optional) Restart the ISDN signaling process, which initiates ISDN connections.

kernel-replication—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Restart the Layer 2 address flooding and learning process.

l2cpd-service—(Optional) Restart the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

l2tp-service— (M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Layer 2 Tunneling Protocol (L2TP) process, which sets up client services for establishing Point-to-Point Protocol (PPP) tunnels across a network and negotiating Multilink PPP if it is implemented.

l2tp-universal-edge—(MX Series routers only) (Optional) Restart the L2TP process, which establishes L2TP tunnels and PPP sessions through L2TP tunnels.

lACP—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc number—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process for a specific T640 router that is connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

license-service—(EX Series switches only) (Optional) Restart the feature license management process.

link-management— (TX Matrix and TX Matrix Plus routers and EX Series switches only) (Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.

lldpd-service—(EX Series switches only) (Optional) Restart the Link Layer Discovery Protocol (LLDP) process.

local—(MX Series routers only) (Optional) Restart the software process for the local Virtual Chassis member.

local-policy-decision-function— (Optional) Restart the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

mac-validation— (Optional) Restart the Media Access Control (MAC) validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

member *member-id*—(MX Series routers only) (Optional) Restart the software process for a specific member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

mib-process—(Optional) Restart the Management Information Base (MIB) version II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Restart the Mobile IP process, which configures Junos OS Mobile IP features.

moundd-service—(EX Series switches and MX Series routers only) (Optional) Restart the service for NFS mount requests.

mpls-traceroute—(Optional) Restart the MPLS Periodic Traceroute process.

mspd—(Optional) Restart the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Restart the multicast snooping process, which makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

network-access-service—(QFX Series only) (Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.

nfsd-service—(Optional) Restart the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

packet-triggered-subscribers—(Optional) Restart the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Restart the Peer Selection Service process.

pgcp-service—(Optional) Restart the pgcpd service process running on the Routing Engine. This option does not restart pgcpd processes running on mobile station PICs. To restart pgcpd processes running on mobile station PICs, use the **services pgcp gateway** option.

pgm—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.

pic-services-logging—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

pki-service—(Optional) Restart the PKI Service process.

ppp—(Optional) Restart the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—(Optional) Restart the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

pppoe—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

protected-system-domain-service—(Optional) Restart the Protected System Domain (PSD) process.

redundancy-interface-process—(Optional) Restart the ASP redundancy process.

remote-operations—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.

root-system-domain-service—(Optional) Restart the Root System Domain (RSD) service.

routing—(ACX Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the routing protocol process.

routing <logical-system *logical-system-name*>—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router or switch and maintains the routing tables. Optionally, restart the routing protocol process for the specified logical system only.

sampling—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—(Optional) Restart the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Restart the software process on the TX Matrix router (or switch-card chassis).

sdk-service—(Optional) Restart the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

sfc *number*—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

service-deployment—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

services—(Optional) Restart a service.

services pgcp gateway *gateway-name*—(Optional) Restart the pgcpd process for a specific border gateway function (BGF) running on an MS-PIC. This option does not restart the pgcpd process running on the Routing Engine. To restart the pgcpd process on the Routing Engine, use the **pgcp-service** option.

sflow-service—(EX Series switches only) (Optional) Restart the flow sampling (sFlow technology) process.

snmp—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

static-subscribers—(Optional) Restart the static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

statistics-service—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.

subscriber-management—(Optional) Restart the Subscriber Management process.

subscriber-management-helper—(Optional) Restart the Subscriber Management Helper process.

tunnel-oamd—(Optional) Restart the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

usb-control—(MX Series routers) (Optional) Restart the USB control process.

vrrp—(ACX Series routers, EX Series switches, and MX Series routers only) (Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

web-management—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the Web management process.

Required Privilege Level

reset

Related Documentation

- *Overview of Junos OS CLI Operational Mode Commands*

List of Sample Output [restart interface-control gracefully on page 480](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

[restart interface-control gracefully](#)

```
user@host> restart interface-control gracefully
Interface control process started, pid 41129
```

show policy

List of Syntax	Syntax on page 481 Syntax (EX Series Switches) on page 481
Syntax	<pre>show policy <logical-system (all <i>logical-system-name</i>)> <<i>policy-name</i>> <<i>statistics</i> ></pre>
Syntax (EX Series Switches)	<pre>show policy <<i>policy-name</i>></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>statistics option introduced in Junos OS Release 16.1 for MX Series routers.</p>
Description	Display information about configured routing policies.
Options	<p>none—List the names of all configured routing policies.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>policy-name</i>—(Optional) Show the contents of the specified policy.</p> <p>statistics—(Optional) Use in conjunction with the test policy command to show the length of time (in microseconds) required to evaluate a given policy and the number of times it has been executed. This information can be used, for example, to help structure a policy so it is evaluated efficiently. Timers shown are per route; times are not cumulative. Statistics are incremented even when the router is learning (and thus evaluating) routes from peering routers.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show policy damping • test policy on page 464
List of Sample Output	show policy on page 482 show policy policy-name on page 482 show policy statistics policy-name on page 482 show policy (Multicast Scoping) on page 483 show policy (Route Filter and source Address Filter Lists) on page 483

Output Fields Table 12 on page 263 lists the output fields for the **show policy** command. Output fields are listed in the approximate order in which they appear.

Table 33: show policy Output Fields

Field Name	Field Description
<i>policy-name</i>	Name of the policy listed.
<i>term</i>	Name of the user-defined policy term. The term name unnamed is used for policy elements that occur outside of user defined terms
<i>from</i>	Match condition for the policy.
<i>then</i>	Action for the policy.

Sample Output

show policy

```
user@host> show policy
Configured policies:
__vrf-export-red-internal__
__vrf-import-red-internal__
red-export
rf-test-policy
multicast-scoping
```

show policy policy-name

```
user@host> show policy vrf-import-red-internal
Policy vrf-import-red-internal:
  from
    203.0.113.0/28 accept
    203.0.113.32/28 accept
  then reject
```

show policy statistics policy-name

```
user@host> show policy statistics iBGP-v4-RR-Import
Policy iBGP-v4-RR-Import:
  [1243328] Term Lab-Infra:
    from [1243328 0] proto BGP
      [28 0] route filter:
        10.11.0.0/8 orlonger
        10.13.0.0/8 orlonger
    then [28 0] accept
  [1243300] Term External:
    from [1243300 1] proto BGP
      [1243296 0] community Ext-Com1 [64496:1515 ]
      [1243296 0] prefix-list-filter Customer-Routes
      [1243296 0] aspath AS6221
      [1243296 1] route filter:
        172.16.49.0/12 orlonger
        172.16.50.0/12 orlonger
        172.16.51.0/12 orlonger
```

```

172.16.52.0/12 orlonger
172.16.56.0/12 orlonger
172.16.60.0/12 orlonger
then [1243296 2] community + Ext-Com2 [64496:2000 ] [1243296 0] accept
[4] Term Final:
then [4 0] reject

```

show policy (Multicast Scoping)

```

user@host> show policy multicast-scoping
Policy multicast-scoping:
  from
    multicast-scope == 8
  then
    accept

```

show policy (Route Filter and source Address Filter Lists)

```

user@host> show policy rf-test-policy
Policy rf-test-policy:
  Term term1:
    from source-address-filter-list saf-list-1
    source-address filter:
      192.0.2.0/29 longer
      192.0.2.64/28 exact
      192.0.2.128/28 exact
      192.0.2.160/28 orlonger
  Term term2:
    from route-filter-list rf-list-1
    route filter:
      198.51.100.0/29 upto 198.51.100.0/30
      198.51.100.8/29 upto 198.51.100.8/30 accept
  Term unnamed:
    then reject

```

show policy conditions

Syntax	<pre>show policy conditions <condition-name> <detail> <dynamic> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show policy conditions <condition-name> <detail> <dynamic></pre>
Release Information	<p>Command introduced in Junos OS Release 9.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display all the configured conditions as well as the routing tables with which the configuration manager is interacting. If the detail keyword is included, the output also displays dependent routes for each condition.</p>
Options	<p>none—Display all configured conditions and associated routing tables.</p> <p>condition-name—(Optional) Display information about the specified condition only.</p> <p>detail—(Optional) Display the specified level of output.</p> <p>dynamic—(Optional) Display information about the conditions in the dynamic database.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show policy conditions detail on page 485
Output Fields	<p>Table 13 on page 265 lists the output fields for the show policy conditions command. Output fields are listed in the approximate order in which they appear.</p>

Table 34: show policy conditions Output Fields

Field Name	Field Description	Level of Output
Condition	Name of configured condition.	All levels
event	Condition type. If the if-route-exists option is configured, the event type is: Existence of a route in a specific routing table.	All levels
Dependent routes	List of routes dependent on the condition, along with the latest generation number.	detail

Table 34: show policy conditions Output Fields (*continued*)

Field Name	Field Description	Level of Output
Condition tables	List of routing tables associated with the condition, along with the latest generation number and number of dependencies.	All levels
If-route-exists conditions	List of conditions configured to look for a route in the specified table.	All levels

Sample Output

show policy conditions detail

```

user@host> show policy conditions detail
Configured conditions:
Condition cond1, event: Existence of a route in a specific routing table
Dependent routes:
  172.16.4.4/32, generation 3
  6.6.6.6/32, generation 3
  10.10.10.10/32, generation 3

Condition cond2, event: Existence of a route in a specific routing table
Dependent routes:
None

Condition tables:
Table inet.0, generation 4, dependencies 3, If-route-exists conditions: cond1
(static) cond2 (static)

```

show ripng general-statistics

List of Syntax	Syntax on page 486 Syntax (EX Series Switch) on page 486
Syntax	show ripng general-statistics <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switch)	show ripng general-statistics
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display general RIP next-generation (RIPng) statistics.
Options	none —Display general RIPng statistics. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear ripng general-statistics on page 469
List of Sample Output	show ripng general-statistics on page 487
Output Fields	Table 35 on page 486 lists the output fields for the show ripng general-statistics command. Output fields are listed in the approximate order in which they appear.

Table 35: show ripng general-statistics Output Fields

Field Name	Field Description
bad msgs	Number of invalid messages received.
no rcv intf	Number of packets received with no matching interface.
curr memory	Amount of memory currently used by RIPng.
max memory	Most memory used by RIPng.

Sample Output

show ripng general-statistics

```
user@host> show ripng general-statistics
RIPng I/O info:
  bad msgs      :      0
  no recv intf  :      0
  curr memory   :      0
  max memory    :      0
```

show ripng neighbor

List of Syntax [Syntax on page 488](#)
[Syntax \(EX Series Switch\) on page 488](#)

Syntax show ripng neighbor
 <logical-system (all | *logical-system-name*)>
 <*name*>

Syntax (EX Series Switch) show ripng neighbor
 <*name*>

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display information about RIP next-generation (RIPng) neighbors.

Options **none**—Display information about all RIPng neighbors.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

name—(Optional) Display detailed information about a specific RIPng neighbor.

Required Privilege Level view

List of Sample Output [show ripng neighbor on page 489](#)

Output Fields [Table 36 on page 488](#) lists the output fields for the **show ripng neighbor** command. Output fields are listed in the approximate order in which they appear.

Table 36: show ripng neighbor Output Fields

Field Name	Field Description
Neighbor	Name of RIPng neighbor.
State	State of the connection: Up or Dn (Down).
Source Address	Source address.
Destination Address	Destination address.
Send	Send options: broadcast , multicast , none , version 1 , or yes .
Recv	Type of packets to accept: both , none , version 1 , or yes .

Table 36: show ripng neighbor Output Fields (*continued*)

Field Name	Field Description
In Met	Metric added to incoming routes when advertising into RIPng routes that were learned from other protocols.

Sample Output

show ripng neighbor

```
user@host> show ripng neighbor
Neighbor      State  Source Address          Dest Address  Send Recv Met
-----
fe-0/0/2.0    Up    fe80::290:69ff:fe68:b002  ff02::9      yes  yes   1
```

show ripng statistics

List of Syntax	Syntax on page 490 Syntax (EX Series Switch) on page 490
Syntax	show ripng statistics <logical-system (all <i>logical-system-name</i>)> < <i>name</i> >
Syntax (EX Series Switch)	show ripng statistics < <i>name</i> >
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display RIP next generation (RIPng) statistics about messages sent and received on an interface, as well as information received from advertisements from other routing devices.
Options	none —Display RIPng statistics for all neighbors. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>name</i> —(Optional) Display detailed information about a specific RIPng neighbor.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear ripng statistics on page 470
List of Sample Output	show ripng statistics on page 491
Output Fields	Table 37 on page 491 lists the output fields for the show ripng statistics command. Output fields are listed in the approximate order in which they appear.

Table 37: show ripng statistics Output Fields

Field Name	Field Description
RIPng info	Information about RIPng on the specified interface: <ul style="list-style-type: none"> port—UDP port number used for RIPng. holddown—Hold-down interval, in seconds. rts learned—Number of routes learned through RIPng. rts held down—Number of routes held down by RIPng. rqsts dropped—Number of received request packets that were dropped. resps dropped—Number of received response packets that were dropped. restart—Graceful restart status. Displayed when RIPng is or has been in the process of graceful restart.
logical-interface	Name of the logical interface and its statistics: <ul style="list-style-type: none"> routes learned—Number of routes learned on the logical interface. routes advertised—Number of routes advertised by the logical interface. timeout—Timeout interval, in seconds. update interval—Interval between routing table updates, in seconds.
Counter	List of counter types: <ul style="list-style-type: none"> Updates Sent—Number of update messages sent. Triggered Updates Sent—Number of triggered update messages sent. Responses Sent—Number of response messages sent. Bad Messages—Number of invalid messages received. Updates Received—Number of RIPng update messages received. Bad Route Entries—Number of RIPng invalid route entry messages received. Updates Ignored—Number of RIPng update messages ignored. RIPng Requests Received—Number of RIPng request messages received. RIPng Requests Ignored—Number of RIPng request messages ignored.
Total	Total number of packets for the selected counter.
Last 5 min	Number of packets for the selected counter in the most recent 5-minute period.
Last minute	Number of packets for the selected counter in the most recent 1-minute period.

Sample Output

show ripng statistics

```

user@host> show ripng statistics
RIPng info: port 521; holddown 120s;
           rts learned  rts held down  rqsts dropped  resps dropped
                   0             0             0             0

so-0/1/3.0: 0 routes learned; 1 routes advertised; timeout 180s; update interval
20s
Counter                               Total    Last 5 min  Last minute
-----                               -

```

Updates Sent	934	16	4
Triggered Updates Sent	1	0	0
Responses Sent	0	0	0
Bad Messages	0	0	0
Updates Received	0	0	0
Bad Route Entries	0	0	0
Updates Ignored	0	0	0
RIPng Requests Received	0	0	0
RIPng Requests Ignored	0	0	0

show route

List of Syntax [Syntax on page 493](#)
 [Syntax \(EX Series Switches\) on page 493](#)

Syntax show route
 <all>
 <destination-prefix>
 <logical-system (all | *logical-system-name*)>
 <private>
 <te-ipv4-prefix-ip *te-ipv4-prefix-ip*>
 <te-ipv4-prefix-node-ip *te-ipv4-prefix-node-ip*>
 <te-ipv4-prefix-node-iso *te-ipv4-prefix-node-iso*>

Syntax (EX Series Switches) show route
 <all>
 <destination-prefix>
 <private>

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Option **private** introduced in Junos OS Release 9.5.
 Option **private** introduced in Junos OS Release 9.5 for EX Series switches.
 Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
 Option **display-client-data** introduced in Junos OS Release 16.2R1 on MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series routers.
 Options **te-ipv4-prefix-ip**, **te-ipv4-prefix-node-ip**, and **te-ipv4-prefix-node-iso** introduced in Junos OS Release 17.2R1 on MX Series and PTX Series.

Description Display the active entries in the routing tables.

Options **none**—Display brief information about all active entries in the routing tables.

all—(Optional) Display information about all routing tables, including private, or internal, routing tables.

destination-prefix—(Optional) Display active entries for the specified address or range of addresses.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

private—(Optional) Display information only about all private, or internal, routing tables.

display-client-data —(Optional) Display client id and cookie information for routes installed by the routing protocol process client applications.

te-ipv4-prefix-ip *te-ipv4-prefix-ip*—(Optional) Display IPv4 address of the traffic-engineering prefix, without the mask length if present in the routing table.

te-ipv4-prefix-node-ip *te-ipv4-prefix-node-ip*—(Optional) Display all prefixes that have originated from the traffic-engineering node. You can filter IPv4 node addresses from the traffic-engineered routes in the **Isdist.0** table.

te-ipv4-prefix-node-iso *te-ipv4-prefix-node-iso*—(Optional) Display all prefixes that have originated from the traffic-engineering node. You can filter IPv4 routes with the specified ISO circuit ID from the **Isdist.0** table.

Required Privilege Level

view

Related Documentation

- *Understanding IS-IS Configuration*
- *Example: Configuring IS-IS*
- *Examples: Configuring Internal BGP Peering*
- *Examples: Configuring External BGP Peering*
- *Examples: Configuring OSPF Routing Policy*
- *Verifying and Managing Junos OS Enhanced Subscriber Management*

List of Sample Output

[show route on page 497](#)
[show route \(VPN\) on page 498](#)
[show route \(with Destination Prefix\) on page 498](#)
[show route destination-prefix detail on page 498](#)
[show route extensive on page 498](#)
[show route extensive \(ECMP\) on page 499](#)
[show route extensive \(Multipath Resolution\) on page 499](#)
[show route \(Enhanced Subscriber Management\) on page 503](#)
[show route \(IPv6 Flow Specification\) on page 504](#)
[show route display-client-data detail on page 504](#)
[show route te-ipv4-prefix-ip on page 505](#)
[show route te-ipv4-prefix-ip extensive on page 505](#)
[show route te-ipv4-prefix-node-iso on page 508](#)
[show route te-ipv4-prefix-node-iso extensive on page 508](#)
[show route te-ipv4-prefix-node-iso detail on page 511](#)

Output Fields [Table 17 on page 275](#) describes the output fields for the **show route** command. Output fields are listed in the approximate order in which they appear.

Table 38: show route Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 38: show route Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). A holddown route was once the active route and is no longer the active route. The route is in the holddown state because a protocol still has interest in the route, meaning that the interest bit is set. A protocol might have its interest bit set on the previously active route because the protocol is still advertising the route. The route will be deleted after all protocols withdraw their advertisement of the route and remove their interest bit. A persistent holddown state often means that the interested protocol is not releasing its interest bit properly. <p>However, if you have configured advertisement of multiple routes (with the add-path or advertise-inactive statement), the holddown bit is most likely set because BGP is advertising the route as an active route. In this case, you can ignore the holddown state because nothing is wrong.</p> <ul style="list-style-type: none"> • hidden (routes that are not used because of a routing policy).
<i>destination-prefix</i>	<p>Route destination (for example:10.0.0.1/24). Sometimes the route information is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only. For example, 10.1.1.195:NoCtrlWord:1:1:Local/96): <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote.
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>
<i>weeks:days hours:minutes:seconds</i>	How long the route been known (for example, 2w4d 13:11:14 , or 2 weeks, 4 days, 13 hours, 11 minutes, and 14 seconds).
<i>metric</i>	Cost value of the indicated route. For routes within an AS, the cost is determined by the IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.

Table 38: show route Output Fields (*continued*)

Field Name	Field Description
localpref	Local preference value included in the route.
from	Interface from which the route was received.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
encapsulated	Extended next-hop encoding capability enabled for the specified BGP community for routing IPv4 traffic over IPv6 tunnels. When BGP receives routes without the tunnel community, IPv4-Over IPv6 tunnels are not created and BGP routes are resolved without encapsulation.
Route Labels	Stack of labels carried in the BGP route update.
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGP peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
to	<p>Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.</p> <p>If the destination is Discard, traffic is dropped.</p>

Table 38: show route Output Fields (*continued*)

Field Name	Field Description
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing. • lsp-path-name—Name of the LSP used to reach the next hop. • label-action—MPLS label and operation occurring at the next hop. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label). For VPNs, expect to see multiple push operations, corresponding to the inner and outer labels required for VPN routes (in the case of a direct PE-to-PE connection, the VPN route would have the inner label push only).
Private unicast	(Enhanced subscriber management for MX Series routers) Indicates that an access-internal route is managed by enhanced subscriber management. By contrast, access-internal routes <i>not</i> managed by enhanced subscriber management are displayed with associated next-hop and media access control (MAC) address information.
balance	Distribution of the load based on the underlying operational interface bandwidth for equal-cost multipaths (ECMP) across the nexthop gateways in percentages.

Sample Output

show route

```

user@host> show route
inet.0: 11 destinations, 12 routes (11 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:65500:1:10.0.0.20/240
    * [MVPN/70] 19:53:41, metric2 1
    Indirect
1:65500:1:10.0.0.40/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
    AS path: I
    > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
    [BGP/170] 19:53:26, localpref 100, from 10.0.0.33
    AS path: I
    > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
1:65500:1:10.0.0.60/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
    AS path: I
    > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF
    [BGP/170] 19:53:25, localpref 100, from 10.0.0.33
    AS path: I
    > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF

```

show route (VPN)

The following sample output shows a VPN route with composite next hops enabled. The first **Push** operation corresponds to the outer label. The second **Push** operation corresponds to the inner label.

```
user@host> show route 192.0.2.0

13979:665001.inet.0: 871 destinations, 3556 routes (871 active, 0 holddown, 0
hidden)
+ = Active Route, - = Last Active, * = Both

192.0.2.0/24      [BGP/170] 00:28:32, localpref 100, from 10.9.9.160
                  AS path: 13980 ?, validation-state: unverified
                  > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                  [BGP/170] 00:28:28, localpref 100, from 10.9.9.169
                  AS path: 13980 ?, validation-state: unverified
                  > to 10.100.0.42 via ae2.0, Push 126016, Push 300368(top)
                  #[Multipath/255] 00:28:28, metric2 102
                  > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                  to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
```

show route (with Destination Prefix)

```
user@host> show route 172.16.0.0/12

inet.0: 10 destinations, 10 routes (9 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.0.0/12    *[Static/5] 2w4d 12:54:27
                  > to 192.168.167.254 via fxp0.0
```

show route destination-prefix detail

```
user@host> show route 198.51.100.0 detail

inet.0: 15 destinations, 20 routes (15 active, 0 holddown, 0 hidden)
198.51.100.0/24 (2 entries, 2 announced)
    *BGP      Preference: 170/-101
    ...
    BGP-Static Preference: 4294967292
    Next hop type: Discard
    Address: 0x9041ae4
    Next-hop reference count: 2
    State: <NoReadvrt Int Ext AlwaysFlash>
    Inactive reason: Route Preference
    Local AS: 200
    Age: 4d 1:40:40
    Validation State: unverified
    Task: RT
    Announcement bits (1): 2-BGP_RT_Background
    AS path: 4 5 6 I
```

show route extensive

```
user@host> show route extensive

v1.mvpn.0: 5 destinations, 8 routes (5 active, 1 holddown, 0 hidden)
1:65500:1:10.0.0.40/240 (1 entry, 1 announced)
    *BGP      Preference: 170/-101
```

```

PMSI: Flags 0x0: Label[0:0:0]: PIM-SM: Sender 10.0.0.40 Group
203.0.113.1
  Next hop type: Indirect
  Address: 0x92455b8
  Next-hop reference count: 2
  Source: 10.0.0.30
  Protocol next hop: 10.0.0.40
  Indirect next hop: 2 no-forward
  State: <Active Int Ext>
    Local AS: 64510 Peer AS: 64511
  Age: 3 Metric2: 1
  Validation State: unverified
  Task: BGP_64510.10.0.0.30+179
  Announcement bits (2): 0-PIM.v1 1-mvpn global task
  AS path: I (Originator) Cluster list: 10.0.0.30
  AS path: Originator ID: 10.0.0.40
  Communities: target:64502:100 encapsulation:0L:14 Import
Accepted
  Localpref: 100
  Router ID: 10.0.0.30
  Primary Routing Table bgp.mvpn.0
  Indirect next hops: 1
    Protocol next hop: 10.0.0.40 Metric: 1
    Indirect next hop: 2 no-forward
    Indirect path forwarding next hops: 1
      Next hop type: Router
      Next hop: 10.0.24.4 via lt-0/3/0.24 weight 0x1
    10.0.0.40/32 Originating RIB: inet.3
      Metric: 1 Node path count: 1
      Forwarding nexthops: 1
        Nexthop: 10.0.24.4 via lt-0/3/0.24

```

show route extensive (ECMP)

```

user@host> show route extensive
*IS-IS Preference: 15
  Level: 1
  Next hop type: Router, Next hop index: 1048577
  Address: 0XXXXXXXXXX
  Next-hop reference count: YY
  Next hop: 172.16.50.2 via ae1.0 balance 43%, selected
  Session Id: 0x141
  Next hop: 192.0.2.2 via ae0.0 balance 57%

```

show route extensive (Multipath Resolution)

```

user@host> show route extensive
inet.0: 37 destinations, 37 routes (36 active, 0 holddown, 1 hidden)
10.1.1.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.1.1.2/32 -> {indirect(1048574)}
*Static Preference: 5
  Next hop type: Indirect, Next hop index: 0
  Address: 0xb39d1b0
  Next-hop reference count: 2
  Next hop type: Router, Next hop index: 581
  Next hop: 12.1.1.2 via ge-2/0/1.0, selected
  Session Id: 0x144
  Next hop: 13.1.1.2 via ge-2/0/2.0, selected
  Session Id: 0x145

```

```

Protocol next hop: 10.1.1.1
Indirect next hop: 0xb2b20f0 1048574 INH Session ID: 0x143
State: <Active Int Ext>
Age: 2:53 Metric2: 0
Validation State: unverified
Task: RT
Announcement bits (2): 0-KRT 2-Resolve tree 1
AS path: I
Indirect next hops: 1
    Protocol next hop: 10.1.1.1
    Indirect next hop: 0xb2b20f0 1048574 INH Session ID: 0x143

    Indirect path forwarding next hops: 2
        Next hop type: Router
        Next hop: 12.1.1.2 via ge-2/0/1.0
        Session Id: 0x144
        Next hop: 13.1.1.2 via ge-2/0/2.0
        Session Id: 0x145
10.1.1.1/32 Originating RIB: inet.0
    Node path count: 1
    Node flags: 1
    Forwarding nexthops: 2 (Merged)
    Nexthop: 12.1.1.2 via ge-2/0/1.0
    Nexthop: 13.1.1.2 via ge-2/0/2.0

user@host> show route active-path extensive
user@host> show route 141.1.1.1 active-path extensive

inet.0: 1000061 destinations, 1000082 routes (1000061 active, 0 holddown, 0 hidden)
141.1.1.1/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 141.1.1.1/32 -> {indirect(1051215)}
unicast reverse-path: 0
[ae0.0 ae1.0]
Page 0 idx 0, (group Internet-IPv4 type External) Type 1 val 0xbb2e53d8 (adv_entry)
Advertised metrics:
Nexthop: Self
AS path: [500] 410 I
Communities:
Path 141.1.1.1 from 50.0.0.11 Vector len 4. Val: 0
*BGP Preference: 170/-101
Next hop type: Indirect, Next hop index: 0
Address: 0x2e9aacdc
Next-hop reference count: 500000
Source: 50.0.0.11
Next hop type: Router, Next hop index: 0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 25, Push 20(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 20: None;
Label element ptr: 0xb5dc1780
Label parent element ptr: 0x18d48080
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 25, Push 22(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 22: None;
Label element ptr: 0xb5dc1700
Label parent element ptr: 0x18d41000

```



```

Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 24, Push 48(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 48: None;
Label element ptr: 0x18d40800
Label parent element ptr: 0x18d49780
Label element references: 3
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Label operation: Push 3851, Push 24, Push 49(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 49: None;
Label element ptr: 0xb5dc1680
Label parent element ptr: 0x18d48f00
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 25, Push 21(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 21: None;
Label element ptr: 0xb5dc1600
Label parent element ptr: 0x18d44d80
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 25, Push 25(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 25: None; Label 25: None;
Label element ptr: 0xb5dc1580
Label parent element ptr: 0x18d3da80
Label element references: 2
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1, selected
Label operation: Push 3851, Push 24, Push 68(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 68: None;
Label element ptr: 0x18d41500
Label parent element ptr: 0x18d49000
Label element references: 3
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Label operation: Push 3851, Push 24, Push 69(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 3851: None; Label 24: None; Label 69: None;
Label element ptr: 0xb5dc1500
Label parent element ptr: 0x18d48300
Label element references: 2

```

```
Label element child references: 0
Label element lsp id: 0
Session Id: 0x0
Protocol next hop: 50.0.0.11
Label operation: Push 3851
Label TTL action: prop-ttl
Load balance label: Label 3851: None;
Indirect next hop: 0x1883e200 1051215 INH Session ID: 0xb0d
State:
Local AS: 500 Peer AS: 500
Age: 1:40:03 Metric2: 2
Validation State: unverified
Task: BGP_500.50.0.0.11
Announcement bits (5): 0-KRT 8-KRT 9-BGP_RT_Background 10-Resolve tree 5 11-Resolve
tree 8
AS path: 410 I
Accepted
Route Label: 3851
Localpref: 100
Router ID: 50.0.0.11
Indirect next hops: 1
Protocol next hop: 50.0.0.11 Metric: 2
Label operation: Push 3851
Label TTL action: prop-ttl
Load balance label: Label 3851: None;
Indirect next hop: 0x1883e200 1051215 INH Session ID: 0xb0d
Indirect path forwarding next hops (Merged): 8
Next hop type: Router
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.12.2 via ae0.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
Next hop: 50.0.13.3 via ae1.0 weight 0x1
Session Id: 0x0
50.0.0.11/32 Originating RIB: inet.3
Metric: 1 Node path count: 4
Node flags: 1
Indirect nexthops: 4
Protocol Nexthop: 50.0.0.4 Metric: 1 Push 24
Indirect nexthop: 0x1880f200 1048597 INH Session ID: 0xb0c
Path forwarding nexthops link: 0x36120400
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.4/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
```

```

Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.5 Metric: 1 Push 24
Indirect nexthop: 0x18810000 1048596 INH Session ID: 0xb0b
Path forwarding nexthops link: 0x1545be00
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.5/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.6 Metric: 1 Push 25
Indirect nexthop: 0x1880e600 1048588 INH Session ID: 0xb0a
Path forwarding nexthops link: 0x3611f440
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.6/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
Protocol Nexthop: 50.0.0.7 Metric: 1 Push 25
Indirect nexthop: 0x1880dc00 1048586 INH Session ID: 0xb09
Path forwarding nexthops link: 0x15466d80
Path inh link: 0x0
Indirect path forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0
50.0.0.7/32 Originating RIB: inet.3
Metric: 1 Node path count: 1
Forwarding nexthops: 2
Nexthop: 50.0.12.2 via ae0.0
Session Id: 0
Nexthop: 50.0.13.3 via ae1.0
Session Id: 0

```

show route (Enhanced Subscriber Management)

```

user@host> show route
inet.0: 41 destinations, 41 routes (40 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

198.51.100.11/24    *[Access-internal/12] 00:00:08
> to #0 10.0.0.1.93.65 via demux0.1073741824

```

```
198.51.100.12/24    *[Access-internal/12] 00:00:08
                  Private unicast
```

show route (IPv6 Flow Specification)

```
user@host> show route
inet6.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::10:255:185:19/128
    *[Direct/0] 05:11:27
    > via lo0.0
2001:db8::11:11:11:0/120
    *[BGP/170] 00:28:58, localpref 100
    AS path: 2000 I, validation-state: unverified
    > to 2001:db8::13:14:2:2 via ge-1/1/4.0
2001:db8::13:14:2:0/120*[Direct/0] 00:45:07
    > via ge-1/1/4.0
2001:db8::13:14:2:1/128*[Local/0] 00:45:18
    Local via ge-1/1/4.0
fe80::2a0:a50f:fc71:71d5/128
    *[Direct/0] 05:11:27
    > via lo0.0
fe80::5e5e:abff:feb0:933e/128
    *[Local/0] 00:45:18
    Local via ge-1/1/4.0

inet6flow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::11:11:11:10/128,* ,proto=6,dstport=80,srcport=65535/term:1
    *[BGP/170] 00:28:58, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious
2001:db8::11:11:11:30/128,* ,icmp6-type=128,len=100,dscp=10/term:2
    *[BGP/170] 00:20:54, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious
```

show route display-client-data detail

```
user@host> show route 198.51.100.0/24 display-client-data detail
inet.0: 59 destinations, 70 routes (59 active, 0 holddown, 0 hidden)
198.51.100.0/24 (1 entry, 1 announced)
    State: <FlashAll>
    *BGP-Static Preference: 5/-101
    Next hop type: Indirect, Next hop index: 0
    Address: 0xa5c2af8
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 1641
    Next hop: 192.0.2.1 via ge-2/1/1.0, selected
    Session Id: 0x160
    Protocol next hop: 192.0.2.1
    Indirect next hop: 0xa732cb0 1048621 INH Session ID: 0x17e
    State: <Active Int Ext AlwaysFlash NSR-incapable Programmed>
    Age: 3:13      Metric2: 0
    Validation State: unverified
    Announcement bits (3): 0-KRT 5-LDP 6-Resolve tree 3
```

```
AS path: I
Client id: 1, Cookie: 1
```

show route te-ipv4-prefix-ip

```
user@host> show route te-ipv4-prefix-ip 10.10.10.10
lsdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152
      *[IS-IS/15] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0101.0101.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0202.0202.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0303.0303.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0404.0404.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0505.0505.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0606.0606.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0707.0707.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:01:01
      Fictitious
```

show route te-ipv4-prefix-ip extensive

```
user@host> show route te-ipv4-prefix-ip 10.10.10.10 extensive
lsdist.0: 298 destinations, 298 routes (298 active, 0 holddown, 0 hidden)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
    State:<Active NotInstall>
    Local AS: 100
    Age: 7:58
```

```
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0101.0101.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0>

PREFIX { Node { AS:100 ISO:0100.0202.0202.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0303.0303.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0404.0404.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
```

```

        State: <Active NotInstall>
        Local AS: 100
        Age: 7:58
        Validation State: unverified
        Task: IS-IS
        AS path: I
        Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0505.0505.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
      State: <Active NotInstall>
      Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0606.0606.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
      State: <Active NotInstall>
      Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0707.0707.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 298
    Next hop:
      State: <Active NotInstall>
      Local AS: 100
      Age: 7:58
      Validation State: unverified
      Task: IS-IS
      AS path: I
      Prefix SID: 1000, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0

```

```

Address: 0xa1a2ac4
Next-hop reference count: 298
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 7:58
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1000, Flags: 0x40, Algo: 0

```

show route te-ipv4-prefix-node-iso

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00
Isdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152
      *[IS-IS/15] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152
      *[IS-IS/18] 00:05:20
      Fictitious

```

show route te-ipv4-prefix-node-iso extensive

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00 extensive
Isdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0

```



```

}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1001, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1002, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I

```

```
Prefix SID: 1003, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1004, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1005, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1006, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
```

```

Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1007, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:47
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

```

show route te-ipv4-prefix-node-iso detail

```

user@host> show route te-ipv4-prefix-node-iso 0100.0a0a.0a0a.00 detail
lsdist.0: 283 destinations, 283 routes (283 active, 0 holddown, 0 hidden)
PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L1:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:1.1.1.1/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1001, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:2.2.2.2/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18

```

```
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1002, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:3.3.3.3/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1003, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:4.4.4.4/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1004, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:5.5.5.5/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
*IS-IS Preference: 18
Level: 2
Next hop type: Fictitious, Next hop index: 0
Address: 0xa1a2ac4
Next-hop reference count: 283
Next hop:
State: <Active NotInstall>
Local AS: 100
Age: 6:54
Validation State: unverified
Task: IS-IS
AS path: I
Prefix SID: 1005, Flags: 0xe0, Algo: 0
```

```

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:6.6.6.6/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1006, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:7.7.7.7/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1007, Flags: 0xe0, Algo: 0

PREFIX { Node { AS:100 ISO:0100.0a0a.0a0a.00 } { IPv4:10.10.10.10/32 } ISIS-L2:0
}/1152 (1 entry, 0 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Fictitious, Next hop index: 0
    Address: 0xa1a2ac4
    Next-hop reference count: 283
    Next hop:
    State: <Active NotInstall>
    Local AS: 100
    Age: 6:54
    Validation State: unverified
    Task: IS-IS
    AS path: I
    Prefix SID: 1000, Flags: 0x40, Algo: 0

```

show route active-path

List of Syntax	Syntax on page 514 Syntax (EX Series Switches) on page 514
Syntax	<code>show route active-path</code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route active-path</code> <code><brief detail extensive terse></code>
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display all active routes for destinations. An active route is a route that is selected as the best path. Inactive routes are not displayed.
Options	none —Display all active routes. brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
List of Sample Output	show route active-path on page 514 show route active-path brief on page 515 show route active-path detail on page 515 show route active-path extensive on page 516 show route active-path terse on page 518
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route active-path

```
user@host> show route active-path

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.70.19/32    *[Direct/0] 21:33:52
```

```

> via lo0.0
10.255.71.50/32 * [IS-IS/15] 00:18:13, metric 10
> to 172.16.100.1 via so-2/1/3.0
172.16.100.1/24 * [Direct/0] 00:18:36
> via so-2/1/3.0
172.16.100.1/32 * [Local/0] 00:18:41
Local via so-2/1/3.0
192.168.64.0/21 * [Direct/0] 21:33:52
> via fxp0.0
192.168.70.19/32 * [Local/0] 21:33:52
Local via fxp0.0

```

show route active-path brief

The output for the **show route active-path brief** command is identical to that for the **show route active-path** command. For sample output, see [show route active-path on page 295](#).

show route active-path detail

```

user@host> show route active-path detail

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)

10.255.70.19/32 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

10.255.71.50/32 (1 entry, 1 announced)
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Router, Next hop index: 397
    Next-hop reference count: 4
    Next hop: 172.16.100.1 via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:31 Metric: 10
    Task: IS-IS
    Announcement bits (4): 0-KRT 2-IS-IS 5-Resolve tree 2 6-Resolve
tree 3
    AS path: I

172.16.100.0/24 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via so-2/1/3.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:54
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3

```

```
AS path: I

172.16.100.1/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: so-2/1/3.0
    State: <Active NoReadvrt Int>
    Local AS: 200
    Age: 21:59
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.64.0/21 (1 entry, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via fxp0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I

192.168.70.19/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 11
    Interface: fxp0.0
    State: <Active NoReadvrt Int>
    Local AS: 200
    Age: 21:37:10
    Task: IF
    Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
    AS path: I
```

show route active-path extensive

```
user@host> show route active-path extensive

inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
10.255.70.19/32 (1 entry, 1 announced)
TSI:
IS-IS level 1, LSP fragment 0
IS-IS level 2, LSP fragment 0
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 3
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 200
    Age: 21:39:47
    Task: IF
    Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3

AS path: I

10.255.71.50/32 (1 entry, 1 announced)
```



```

TSI:
KRT in-kernel 10.255.71.50/32 -> {172.16.100.1}
IS-IS level 2, LSP fragment 0
    *IS-IS Preference: 15
        Level: 1
        Next hop type: Router, Next hop index: 397
        Next-hop reference count: 4
        Next hop: 172.16.100.1 via so-2/1/3.0, selected
        State: <Active Int>
        Local AS: 200
        Age: 24:08 Metric: 10
        Task: IS-IS
        Announcement bits (4): 0-KRT 2-IS-IS 5-Resolve tree 2 6-Resolve
tree 3
        AS path: I

172.16.100.1/24 (1 entry, 1 announced)
TSI:
IS-IS level 1, LSP fragment 0
IS-IS level 2, LSP fragment 0
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 3
        Next hop: via so-2/1/3.0, selected
        State: <Active Int>
        Local AS: 200
        Age: 24:31
        Task: IF
        Announcement bits (3): 2-IS-IS 5-Resolve tree 2 6-Resolve tree 3
        AS path: I

172.16.100.1/32 (1 entry, 1 announced)
    *Local Preference: 0
        Next hop type: Local
        Next-hop reference count: 11
        Interface: so-2/1/3.0
        State: <Active NoReadvrt Int>
        Local AS: 200
        Age: 24:36
        Task: IF
        Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
        AS path: I

192.168.64.0/21 (1 entry, 1 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 3
        Next hop: via fxp0.0, selected
        State: <Active Int>
        Local AS: 200
        Age: 21:39:47
        Task: IF
        Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
        AS path: I

192.168.70.19/32 (1 entry, 1 announced)
    *Local Preference: 0
        Next hop type: Local
        Next-hop reference count: 11
        Interface: fxp0.0

```

```
State: <Active NoReadvrt Int>
Local AS: 200
Age: 21:39:47
Task: IF
Announcement bits (2): 5-Resolve tree 2 6-Resolve tree 3
AS path: I
```

show route active-path terse

```
user@host> show route active-path terse
```

```
inet.0: 7 destinations, 7 routes (6 active, 0 holddown, 1 hidden)
```

```
+ = Active Route, - = Last Active, * = Both
```

A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	10.255.70.19/32	D	0			>lo0.0	
*	10.255.71.50/32	I	15	10		>172.16.100.1.	
*	172.16.100.0/24	D	0			>so-2/1/3.0	
*	172.16.100.2/32	L	0			Local	
*	192.168.64.0/21	D	0			>fxp0.0	
*	192.168.70.19/32	L	0			Local	

show route advertising-protocol

Syntax	show route advertising-protocol <i>protocol neighbor-address</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display the routing information as it has been prepared for advertisement to a particular neighbor of a particular dynamic routing protocol.
Options	<p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>neighbor-address</i>—Address of the neighboring router to which the route entry is being transmitted.</p> <p><i>protocol</i>—Protocol transmitting the route:</p> <ul style="list-style-type: none"> • bgp—Border Gateway Protocol • dvmrp—Distance Vector Multicast Routing Protocol • msdp—Multicast Source Discovery Protocol • pim—Protocol Independent Multicast • rip—Routing Information Protocol • ripng—Routing Information Protocol next generation
Additional Information	Routes displayed are routes that the routing table has exported into the routing protocol and that have been filtered by the associated protocol's export routing policy statements. Starting with Junos OS Release 13.3, you can display the routing instance table foo for any address family, on a VPN route reflector, or a VPN AS boundary router that is advertising local VPN routes. However, If you do not specify the table in the command, the output displays each VRF prefix twice.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring the MED Attribute That Determines the Exit Point in an AS</i>
List of Sample Output	show route advertising-protocol bgp (Layer 3 VPN) on page 522 show route advertising-protocol bgp detail on page 522

[show route advertising-protocol bgp detail \(Aggregate Extended Community Bandwidth\) on page 522](#)
[show route advertising-protocol bgp detail \(Labeled Unicast\) on page 523](#)
[show route advertising-protocol bgp detail \(Layer 2 VPN\) on page 523](#)
[show route advertising-protocol bgp detail \(Layer 3 VPN\) on page 523](#)
[show route advertising-protocol bgp extensive all \(Next Hop Self with RIB-out IP Address\) on page 524](#)

Output Fields [Table 18 on page 301](#) lists the output fields for the **show route advertising-protocol** command. Output fields are listed in the approximate order in which they appear.

Table 39: show route advertising-protocol Output Fields

Field Name	Field Description	Level of Output
<i>routing-table-name</i>	Name of the routing table—for example, inet.0.	All levels
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.	All levels
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy) 	All levels
Prefix	Destination prefix.	brief none
<i>destination-prefix (entry, announced)</i>	Destination prefix. The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination.	detail extensive
BGP group and type	BGP group name and type (Internal or External).	detail extensive
Route Distinguisher	Unique 64-bit prefix augmenting each IP subnet.	detail extensive
Advertised Label	Incoming label advertised by the Label Distribution Protocol (LDP). When an IP packet enters a label-switched path (LSP), the ingress router examines the packet and assigns it a label based on its destination, placing the label in the packet's header. The label transforms the packet from one that is forwarded based on its IP routing information to one that is forwarded based on information associated with the label.	detail extensive
Label-Base, range	First label in a block of labels and label block size. A remote PE router uses this first label when sending traffic toward the advertising PE router.	detail extensive
VPN Label	Virtual private network (VPN) label. Packets are sent between CE and PE routers by advertising VPN labels. VPN labels transit over either a Resource Reservation Protocol (RSVP) or a Label Distribution Protocol (LDP) label-switched path (LSP) tunnel.	detail extensive

Table 39: show route advertising-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Nexthop	<p>Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.</p> <p>If the next-hop advertisement to the peer is Self, and the RIB-out next hop is a specific IP address, the RIB-out IP address is included in the extensive output. See show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address) on page 305.</p>	All levels
MED	Multiple exit discriminator value included in the route.	brief
Lclpref or Localpref	Local preference value included in the route.	All levels
Queued	When BGP route prioritization is enabled and a route is present in a priority queue, this shows which priority queue the route is in.	All levels except brief
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if configured on the router, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>	All levels
Route Labels	Stack of labels carried in the BGP route update.	detail extensive
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.	detail extensive
Originator ID	(For route reflected output only) Address of routing device that originally sent the route to the route reflector.	detail extensive
Communities	Community path attribute for the route. See the output field table for the show route detail command for all possible values for this field.	detail extensive
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.	detail extensive

Table 39: show route advertising-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Attrset AS	Number, local preference, and path of the autonomous system (AS) that originated the route. These values are stored in the Attrset attribute at the originating router.	detail extensive
Layer2-info:encaps	Layer 2 encapsulation (for example, VPLS).	detail extensive
control flags	Control flags: none or Site Down .	detail extensive
mtu	Maximum transmission unit (MTU) of the Layer 2 circuit.	detail extensive

Sample Output

show route advertising-protocol bgp (Layer 3 VPN)

```

user@host> show route advertising-protocol bgp 10.255.14.171
VPN-A.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.172/32 Self              1      100 I
VPN-B.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.181/32 Self              2      100 I

```

show route advertising-protocol bgp detail

```

user@host> show route advertising-protocol bgp 111.222.1.3 detail
bgp20.inet.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
111.222.1.11/32 (1 entry, 1 announced)
  BGP group pe-pe type Internal
    Route Distinguisher: 111.255.14.11:69
    Advertised Label: 100000
    next hop: Self
    Localpref: 100
    AS path: 2 I
    Communities: target:69:20
    AIGP 210
111.8.0.0/16 (1 entry, 1 announced)
  BGP group pe-pe type Internal
    Route Distinguisher: 111.255.14.11:69
    Advertised Label: 100000
    Next hop: Self
    Localpref: 100
    AS path: 2 I
    Communities: target:69:20
    AIGP 210

```

show route advertising-protocol bgp detail (Aggregate Extended Community Bandwidth)

```

user@host> show route advertising-protocol bgp 10.0.4.2 10.0.2.0/30 detail
inet.0: 20 destinations, 26 routes (20 active, 0 holddown, 0 hidden)
* 10.0.2.0/30 (2 entries, 1 announced)
  BGP group external2 type External
    Nexthop: Self

```

```
AS path: [65000] 65001 I
Communities: bandwidth:65000:80000000
```

show route advertising-protocol bgp detail (Labeled Unicast)

```
user@host>show route advertising bgp 1.1.1.3 detail
inet.0: 69 destinations, 70 routes (69 active, 0 holddown, 0 hidden)
* 1.1.1.8/32 (2 entries, 2 announced)
BGP group ibgp type Internal
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: 1.1.1.4
MED: 7
Localpref: 100
AS path: [5] I
Cluster ID: 3.3.3.3
Originator ID: 1.1.1.1
Entropy label capable
inet6.0: 26 destinations, 28 routes (26 active, 0 holddown, 0 hidden)
* 100::1/128 (2 entries, 1 announced)
BGP group ibgp type Internal
Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: [5] I
Cluster ID: 3.3.3.3
Originator ID: 1.1.1.1
```

show route advertising-protocol bgp detail (Layer 2 VPN)

```
user@host> show route advertising-protocol bgp 192.168.24.1 detail
vpn-a.l2vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
192.168.16.1:1:1:1/96 (1 entry, 1 announced)
BGP group int type Internal
Route Distinguisher: 192.168.16.1:1
Label-base : 32768, range : 3
Nexthop: Self
Localpref: 100
AS path: I
Communities: target:65412:100
AIGP 210
Layer2-info: encaps:VLAN, control flags:, mtu:
```

show route advertising-protocol bgp detail (Layer 3 VPN)

```
user@host> show route advertising-protocol bgp 10.255.14.176 detail
vpna.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
* 10.49.0.0/30 (1 entry, 1 announced)
BGP group ibgp type Internal
Route Distinguisher: 10.255.14.174:2
VPN Label: 101264
Nexthop: Self
Localpref: 100
AS path: I
Communities: target:200:100
AIGP 210
AttrSet AS: 100
Localpref: 100
AS path: I
...
```

show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address)

```
user@host> show route advertising-protocol bgp 200.0.0.2 170.0.1.0/24 extensive all
inet.0: 13 destinations, 19 routes (13 active, 0 holddown, 6 hidden)
  170.0.1.0/24 (2 entries, 1 announced)
    BGP group eBGP-INTEROP type External
      Nexthop: Self (rib-out 10.100.3.2)
      AS path: [4713] 200 I
  ...
```


show route all

List of Syntax	Syntax on page 525 Syntax (EX Series Switches) on page 525
Syntax	<pre>show route all <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches)	<pre>show route all</pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	<p>Display information about all routes in all routing tables, including private, or internal, tables.</p>
Options	<p>none—Display information about all routes in all routing tables, including private, or internal, tables.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show route brief on page 311 • show route detail on page 313
List of Sample Output	show route all on page 525
Output Fields	<p>In Junos OS Release 9.5 and later, only the output fields for the show route all command display all routing tables, including private, or hidden, routing tables. The output field table of the show route command does not display entries for private, or hidden, routing tables in Junos OS Release 9.5 and later.</p>

Sample Output

show route all

The following example displays a snippet of output from the **show route** command and then displays the same snippet of output from the **show route all** command:

```
user@host> show route
mpls.0: 7 destinations, 7 routes (5 active, 0 holddown, 2 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
0                *[MPLS/0] 2d 02:24:39, metric 1
```

```

        Receive
1      *[MPLS/0] 2d 02:24:39, metric 1
        Receive
2      *[MPLS/0] 2d 02:24:39, metric 1
        Receive
800017 *[VPLS/7] 1d 14:00:16
        > via vt-3/2/0.32769, Pop
800018 *[VPLS/7] 1d 14:00:26
        > via vt-3/2/0.32772, Pop

user@host> show route all
mpls.0: 7 destinations, 7 routes (5 active, 0 holddown, 2 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
0      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
1      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
2      *[MPLS/0] 2d 02:19:12, metric 1
        Receive
800017 *[VPLS/7] 1d 13:54:49
        > via vt-3/2/0.32769, Pop
800018 *[VPLS/7] 1d 13:54:59
        > via vt-3/2/0.32772, Pop
vt-3/2/0.32769 [VPLS/7] 1d 13:54:49
                Unusable
vt-3/2/0.32772 [VPLS/7] 1d 13:54:59
                Unusable
```

show route best

List of Syntax	Syntax on page 527 Syntax (EX Series Switches) on page 527
Syntax	show route best <i>destination-prefix</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Syntax (EX Series Switches)	show route best <i>destination-prefix</i> <brief detail extensive terse>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the route in the routing table that is the best route to the specified address or range of addresses. The best route is the longest matching route.
Options	<p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p><i>destination-prefix</i>—Address or range of addresses.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show route brief on page 311 • show route detail on page 313
List of Sample Output	show route best on page 527 show route best detail on page 528 show route best extensive on page 529 show route best terse on page 529
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route best

```
user@host> show route best 10.255.70.103
```

```

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.255.70.103/32  * [OSPF/10] 1d 13:19:20, metric 2
                  > to 10.31.1.6 via ge-3/1/0.0
                  via so-0/3/0.0

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.255.70.103/32  * [RSVP/7] 1d 13:20:13, metric 2
                  > via so-0/3/0.0, label-switched-path green-r1-r3

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.0.0.0/8        * [Direct/0] 2d 01:43:34
                  > via fxp2.0
                  [Direct/0] 2d 01:43:34
                  > via fxp1.0

```

show route best detail

```

user@host> show route best 10.255.70.103 detail
inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
10.255.70.103/32 (1 entry, 1 announced)
    *OSPF    Preference: 10
              Next-hop reference count: 9
              Next hop: 10.31.1.6 via ge-3/1/0.0, selected
              Next hop: via so-0/3/0.0
              State: <Active Int>
              Local AS: 69
              Age: 1d 13:20:06      Metric: 2
              Area: 0.0.0.0
              Task: OSPF
              Announcement bits (2): 0-KRT 3-Resolve tree 2
              AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
10.255.70.103/32 (1 entry, 1 announced)
    State: <FlashAll>
    *RSVP    Preference: 7
              Next-hop reference count: 5
              Next hop: via so-0/3/0.0 weight 0x1, selected
              Label-switched-path green-r1-r3
              Label operation: Push 100016
              State: <Active Int>
              Local AS: 69
              Age: 1d 13:20:59      Metric: 2
              Task: RSVP
              Announcement bits (1): 1-Resolve tree 2
              AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
10.0.0.0/8 (2 entries, 0 announced)
    *Direct Preference: 0
              Next hop type: Interface
              Next-hop reference count: 1
              Next hop: via fxp2.0, selected
              State: <Active Int>

```

```

Age: 2d 1:44:20
Task: IF
AS path: I
Direct Preference: 0
Next hop type: Interface
Next-hop reference count: 1
Next hop: via fxp1.0, selected
State: <NotBest Int>
Inactive reason: No difference
Age: 2d 1:44:20
Task: IF
AS path: I

```

show route best extensive

The output for the **show route best extensive** command is identical to that for the **show route best detail** command. For sample output, see [show route best detail on page 309](#).

show route best terse

```

user@host> show route best 10.255.70.103 terse
inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.255.70.103/32  0  10           2           >10.31.1.6
                  so-0/3/0.0

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.255.70.103/32  R   7           2           >so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 10.0.0.0/8        D   0           0           >fxp2.0
                  D   0           0           >fxp1.0

```

show route brief

List of Syntax	Syntax on page 530 Syntax (EX Series Switches) on page 530
Syntax	<code>show route brief</code> <code><destination-prefix></code> <code><logical-system (all logical-system-name)></code>
Syntax (EX Series Switches)	<code>show route brief</code> <code><destination-prefix></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display brief information about the active entries in the routing tables.
Options	none —Display all active entries in the routing table. destination-prefix —(Optional) Display active entries for the specified address or range of addresses. logical-system (all logical-system-name) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show route all on page 306• show route best on page 308
List of Sample Output	show route brief on page 530
Output Fields	For information about output fields, see the Output Field table of the show route command.

Sample Output

show route brief

```
user@host> show route brief
inet.0: 10 destinations, 10 routes (9 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

0.0.0.0/0          *[Static/5] 1w5d 20:30:29
                   Discard
10.255.245.51/32  *[Direct/0] 2w4d 13:11:14
                   > via 100.0
```

```

172.16.0.0/12      *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.0.0/18    *[Static/5] 1w5d 20:30:29
                  > to 192.168.167.254 via fxp0.0
192.168.40.0/22   *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.64.0/18   *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
192.168.164.0/22  *[Direct/0] 2w4d 13:11:14
                  > via fxp0.0
192.168.164.51/32 *[Local/0] 2w4d 13:11:14
                  Local via fxp0.0
207.17.136.192/32 *[Static/5] 2w4d 13:11:14
                  > to 192.168.167.254 via fxp0.0
green.inet.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
100.101.0.0/16    *[Direct/0] 1w5d 20:30:28
                  > via fe-0/0/3.0
100.101.2.3/32   *[Local/0] 1w5d 20:30:28
                  Local via fe-0/0/3.0
172.16.233.5/32  *[OSPF/10] 1w5d 20:30:29, metric 1
                  MultiRecv

```

show route detail

List of Syntax	Syntax on page 532 Syntax (EX Series Switches) on page 532
Syntax	<pre>show route detail <destination-prefix> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show route detail <destination-prefix></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display detailed information about the active entries in the routing tables.
Options	<p>none—Display all active entries in the routing table on all systems.</p> <p>destination-prefix—(Optional) Display active entries for the specified address or range of addresses.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route detail on page 543 show route detail (with BGP Multipath) on page 549 show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 550 show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 550
Output Fields	<p>Table 19 on page 313 describes the output fields for the show route detail command. Output fields are listed in the approximate order in which they appear.</p>

Table 40: show route detail Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route-destination</i> (entry, announced)	<p>Route destination (for example:10.0.0.1/24). The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote. • source—Source of the advertisement: Local or Remote.
<i>label stacking</i>	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of 2 or more exits this routing device with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value.</p> <p>Preference2 values are signed integers, that is, Preference2 values can be either positive or negative values. However, Junos OS evaluates Preference2 values as unsigned integers that are represented by positive values. Based on the Preference2 values, Junos OS evaluates a preferred route differently in the following scenarios:</p> <ul style="list-style-type: none"> • Both Signed Preference2 values <ul style="list-style-type: none"> • Route A = -101 • Route B = -156 <p>Where both the Preference2 values are signed, Junos OS evaluates only the unsigned value of Preference2 and Route A, which has a lower Preference2 value is preferred.</p> • Unsigned Preference2 values <p>Now consider both unsigned Preference2 values:</p> <ul style="list-style-type: none"> • Route A = 4294967096 • Route B = 200 <p>Here, Junos OS considers the lesser Preference2 value and Route B with a Preference2 value of 200 is preferred because it is less than 4294967096.</p> • Combination of signed and unsigned Preference2 values <p>When Preference2 values of two routes are compared, and for one route the Preference2 is a signed value, and for the other route it is an unsigned value, Junos OS prefers the route with the positive Preference2 value over the negative Preference2 value. For example, consider the following signed and unsigned Preference2 values:</p> <ul style="list-style-type: none"> • Route A = -200 • Route B = 200 <p>In this case, Route B with a Preference2 value of 200 is preferred although this value is greater than -200, because Junos OS evaluates only the unsigned value of the Preference2 value.</p>
Level	(IS-IS only). In IS-IS, a single AS can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
Next-hop type	Type of next hop. For a description of possible values for this field, see Table 20 on page 319 .
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path lsp-path-name	Name of the LSP used to reach the next hop.
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to derive a forwarding next hop.
Indirect next hop	Index designation used to specify the mapping between protocol next hops, tags, kernel export policy, and the forwarding next hops.
State	State of the route (a route can be in more than one state). See Table 21 on page 321 .
Local AS	AS number of the local routing device.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances. For sample output, see show route table .
Task	Name of the protocol that has added the route.
Announcement bits	The number of BGP peers or protocols to which Junos OS has announced this route, followed by the list of the recipients of the announcement. Junos OS can also announce the route to the KRT for installing the route into the Packet Forwarding Engine, to a resolve tree, a L2 VC, or even a VPN. For example, <i>n-Resolve inet</i> indicates that the specified route is used for route resolution for next hops found in the routing table. <ul style="list-style-type: none"> <i>n</i>—An index used by Juniper Networks customer support only.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> I—IGP. E—EGP. Recorded—The AS path is recorded by the sample process (sampled). ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used in the AS-path merge process, as defined in RFC 4893. []—If more than one AS number is configured on the routing device, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. ()—Parentheses enclose a confederation. ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
ORR Generation-ID	Displays the optimal route reflection (ORR) generation identifier. ISIS and OSPF interior gateway protocol (IGP) updates filed whenever any of the corresponding ORR route has its metric valued changed, or if the ORR route is added or deleted.
FECs bound to route	Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Prefixes bound to route	Forwarding equivalent class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See Table 22 on page 323 for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down .
mtu	Maximum transmission unit (MTU) information.

Table 40: show route detail Output Fields (*continued*)

Field Name	Field Description
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Accepted Multipath	Current active path when BGP multipath is configured.
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.
Accepted LongLivedStaleImport	<p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.</p> <p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table</p>
ImportAccepted LongLivedStaleImport	<p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table</p> <p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.</p>
Accepted MultipathContrib	Path currently contributing to BGP multipath.
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.

[Table 20 on page 319](#) describes all possible values for the Next-hop Types output field.

Table 41: Next-hop Types Output Field Values

Next-Hop Type	Description
Broadcast (bcast)	Broadcast next hop.
Deny	Deny next hop.
Discard	Discard next hop.
Dynamic List	Dynamic list next hop

Table 41: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Flood	Flood next hop. Consists of components called branches, up to a maximum of 32 branches. Each flood next-hop branch sends a copy of the traffic to the forwarding interface. Used by point-to-multipoint RSVP, point-to-multipoint LDP, point-to-multipoint CCC, and multicast.
Hold	Next hop is waiting to be resolved into a unicast or multicast type.
Indexed (idxd)	Indexed next hop.
Indirect (indr)	Used with applications that have a protocol next hop address that is remote. You are likely to see this next-hop type for internal BGP (IBGP) routes when the BGP next hop is a BGP neighbor that is not directly connected.
Interface	Used for a network address assigned to an interface. Unlike the router next hop, the interface next hop does not reference any specific node on the network.
Local (locl)	Local address on an interface. This next-hop type causes packets with this destination address to be received locally.
Multicast (mcst)	Wire multicast next hop (limited to the LAN).
Multicast discard (mdsc)	Multicast discard.
Multicast group (mgrp)	Multicast group member.
Receive (recv)	Receive.
Reject (rjct)	Discard. An ICMP unreachable message was sent.
Resolve (rslv)	Resolving next hop.
Routed multicast (mcrt)	Regular multicast next hop.
Router	<p>A specific node or set of nodes to which the routing device forwards packets that match the route prefix.</p> <p>To qualify as next-hop type router, the route must meet the following criteria:</p> <ul style="list-style-type: none"> • Must not be a direct or local subnet for the routing device. • Must have a next hop that is directly connected to the routing device.
Table	Routing table next hop.

Table 41: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Unicast (ucst)	Unicast.
Unilist (ulst)	List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.

Table 21 on page 321 describes all possible values for the State output field. A route can be in more than one state (for example, **<Active NoReadvrt Int Ext>**).

Table 42: State Output Field Values

Value	Description
Accounting	Route needs accounting.
Active	Route is active.
Always Compare MED	Path with a lower multiple exit discriminator (MED) is available.
AS path	Shorter AS path is available.
Cisco Non-deterministic MED selection	Cisco nondeterministic MED is enabled, and a path with a lower MED is available.
Clone	Route is a clone.
Cluster list length	Length of cluster list sent by the route reflector.
Delete	Route has been deleted.
Ex	Exterior route.
Ext	BGP route received from an external BGP neighbor.
FlashAll	Forces all protocols to be notified of a change to any route, active or inactive, for a prefix. When not set, protocols are informed of a prefix only when the active route changes.
Hidden	Route not used because of routing policy.
IfCheck	Route needs forwarding RPF check.
IGP metric	Path through next hop with lower IGP metric is available.
Inactive reason	Flags for this route, which was not selected as best for a particular destination.
Initial	Route being added.

Table 42: State Output Field Values (*continued*)

Value	Description
Int	Interior route.
Int Ext	BGP route received from an internal BGP peer or a BGP confederation peer.
Interior > Exterior > Exterior via Interior	Direct, static, IGP, or EBGp path is available.
Local Preference	Path with a higher local preference value is available.
Martian	Route is a martian (ignored because it is obviously invalid).
MartianOK	Route exempt from martian filtering.
Next hop address	Path with lower metric next hop is available.
No difference	Path from neighbor with lower IP address is available.
NoReadvrt	Route not to be advertised.
NotBest	Route not chosen because it does not have the lowest MED.
Not Best in its group	Incoming BGP AS is not the best of a group (only one AS can be the best).
NotInstall	Route not to be installed in the forwarding table.
Number of gateways	Path with a greater number of next hops is available.
Origin	Path with a lower origin code is available.
Pending	Route pending because of a hold-down configured on another route.
Programmed	Route installed programmatically by on-box or off-box applications using API.
Release	Route scheduled for release.
RIB preference	Route from a higher-numbered routing table is available.
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.
Route Metric or MED comparison	Route with a lower metric or MED is available.
Route Preference	Route with lower preference value is available
Router ID	Path through a neighbor with lower ID is available.

Table 42: State Output Field Values (*continued*)

Value	Description
Secondary	Route not a primary route.
Unusable path	Path is not usable because of one of the following conditions: <ul style="list-style-type: none"> The route is damped. The route is rejected by an import policy. The route is unresolved.
Update source	Last tiebreaker is the lowest IP address value.
ProtectionCand	Indicates paths requesting protection.
ProtectionPath	Indicates the route entry that can be used as a protection path.

Table 22 on page 323 describes the possible values for the Communities output field.

Table 43: Communities Output Field Values

Value	Description
<i>area-number</i>	4 bytes, encoding a 32-bit area number. For AS-external routes, the value is 0 . A nonzero value identifies the route as internal to the OSPF domain, and as within the identified area. Area numbers are relative to a particular OSPF domain.
bandwidth: local AS number:link-bandwidth-number	Link-bandwidth community value used for unequal-cost load balancing. When BGP has several candidate paths available for multipath purposes, it does not perform unequal-cost load balancing according to the link-bandwidth community unless all candidate paths have this attribute.
domain-id	Unique configurable number that identifies the OSPF domain.
domain-id-vendor	Unique configurable number that further identifies the OSPF domain.
<i>link-bandwidth-number</i>	Link-bandwidth number: from 0 through 4,294,967,295 (bytes per second).
<i>local AS number</i>	Local AS number: from 1 through 65,535 .
<i>options</i>	1 byte. Currently this is only used if the route type is 5 or 7 . Setting the least significant bit in the field indicates that the route carries a type 2 metric.
origin	(Used with VPNs) Identifies where the route came from.
<i>ospf-route-type</i>	1 byte, encoded as 1 or 2 for intra-area routes (depending on whether the route came from a type 1 or a type 2 LSA); 3 for summary routes; 5 for external routes (area number must be 0); 7 for NSSA routes; or 129 for sham link endpoint addresses.
route-type-vendor	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x8000 . The format is <i>area-number:ospf-route-type:options</i> .

Table 43: Communities Output Field Values (*continued*)

Value	Description
rte-type	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x0306 . The format is area-number:ospf-route-type:options .
target	Defines which VPN the route participates in; target has the format 32-bit IP address:16-bit number . For example, 10.19.0.0:100.
unknown IANA	Incoming IANA codes with a value between 0x1 and 0x7fff . This code of the BGP extended community attribute is accepted, but it is not recognized.
unknown OSPF vendor community	Incoming IANA codes with a value above 0x8000 . This code of the BGP extended community attribute is accepted, but it is not recognized.

Sample Output

show route detail

```

user@host> show route detail

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
10.10.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 1:31:43
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

10.31.1.0/30 (2 entries, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 2
    Next hop: via so-0/3/0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:30:17
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I
  OSPF Preference: 10
    Next-hop reference count: 1
    Next hop: via so-0/3/0.0, selected
    State: <Int>
    Inactive reason: Route Preference
    Local AS: 69
    Age: 1:30:17 Metric: 1
    ORR Generation-ID: 1
  Area: 0.0.0.0
    Task: OSPF
    AS path: I

```

```
10.31.1.1/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 7
    Interface: so-0/3/0.0
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:30:20
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I

...

10.31.2.0/30 (1 entry, 1 announced)
  *OSPF Preference: 10
    Next-hop reference count: 9
    Next hop: via so-0/3/0.0
    Next hop: 10.31.1.6 via ge-3/1/0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:29:56 Metric: 2
    Area: 0.0.0.0
    ORR Generation-ID: 1
  Task: OSPF
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

172.16.233.2/32 (1 entry, 1 announced)
  *PIM Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:31:45
    Task: PIM Recv
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

172.16.233.22/32 (1 entry, 1 announced)
  *IGMP Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 69
    Age: 1:31:43
    Task: IGMP
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

10.255.70.103/32 (1 entry, 1 announced)
  State: <FlashAll>
  *RSVP Preference: 7
    Next-hop reference count: 6
    Next hop: 10.31.1.6 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 100096
```

```

        State: <Active Int>
        Local AS: 69
        Age: 1:25:49 Metric: 2
        Task: RSVP
        Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
        AS path: I

10.255.71.238/32 (1 entry, 1 announced)
    State: <FlashAll>
    *RSVP Preference: 7
        Next-hop reference count: 6
        Next hop: via so-0/3/0.0 weight 0x1, selected
        Label-switched-path green-r1-r2
        State: <Active Int>
        Local AS: 69
        Age: 1:25:49 Metric: 1
        Task: RSVP
        Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
        AS path: I

private__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

47.0005.80ff.f800.0000.0108.0001.0102.5507.1052/152 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active Int>
        Local AS: 69
        Age: 1:31:44
        Task: IF
        AS path: I

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
0 (1 entry, 1 announced)
    *MPLS Preference: 0
        Next hop type: Receive
        Next-hop reference count: 6
        State: <Active Int>
        Local AS: 69
        Age: 1:31:45 Metric: 1
        Task: MPLS
        Announcement bits (1): 0-KRT
        AS path: I

...

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

299840 (1 entry, 1 announced)
TSI:
KRT in-kerne 299840 /52 -> {indirect(1048575)}
    *RSVP Preference: 7/2
        Next hop type: Flood
        Address: 0x9174a30
        Next-hop reference count: 4
        Next hop type: Router, Next hop index: 798
        Address: 0x9174c28
        Next-hop reference count: 2

```

```

Next hop: 172.16.0.2 via lt-1/2/0.9 weight 0x1
Label-switched-path R2-to-R4-2p2mp
Label operation: Pop
Next hop type: Router, Next hop index: 1048574
Address: 0x92544f0
Next-hop reference count: 2
Next hop: 172.16.0.2 via lt-1/2/0.7 weight 0x1
Label-switched-path R2-to-R200-p2mp
Label operation: Pop
Next hop: 172.16.0.2 via lt-1/2/0.5 weight 0x8001
Label operation: Pop
State: <Active Int>
Age: 1:29      Metric: 1
Task: RSVP
Announcement bits (1): 0-KRT
AS path: I...

800010 (1 entry, 1 announced)
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: via vt-3/2/0.32769, selected
    Label operation: Pop
    State: <Active Int>
    Age: 1:29:30
    Task: Common L2 VC
    Announcement bits (1): 0-KRT
    AS path: I

vt-3/2/0.32769 (1 entry, 1 announced)
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: 10.31.1.6 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 800012, Push 100096(top)
    Protocol next hop: 10.255.70.103
    Push 800012
    Indirect next hop: 87272e4 1048574
    State: <Active Int>
    Age: 1:29:30      Metric2: 2
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 1-Common L2 VC
    AS path: I
    Communities: target:11111:1 Layer2-info: encaps:VPLS,
    control flags:, mtu: 0

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

abcd::10:255:71:52/128 (1 entry, 0 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 1
    Next hop: via lo0.0, selected
    State: <Active Int>
    Local AS: 69
    Age: 1:31:44
    Task: IF
    AS path: I

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
    Next hop type: Interface

```

```

        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active NoReadvrt Int>
        Local AS:    69
        Age: 1:31:44
        Task: IF
        AS path: I

ff02::2/128 (1 entry, 1 announced)
  *PIM    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:45
          Task: PIM Recv6
          Announcement bits (1): 0-KRT
          AS path: I

ff02::d/128 (1 entry, 1 announced)
  *PIM    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:45
          Task: PIM Recv6
          Announcement bits (1): 0-KRT
          AS path: I

ff02::16/128 (1 entry, 1 announced)
  *MLD    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS:    69
          Age: 1:31:43
          Task: MLD
          Announcement bits (1): 0-KRT
          AS path: I

private.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
          Next hop type: Interface
          Next-hop reference count: 1
          Next hop: via lo0.16385, selected
          State: <Active NoReadvrt Int>
          Age: 1:31:44
          Task: IF
          AS path: I

green.l2vpn.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

10.255.70.103:1:3:1/96 (1 entry, 1 announced)
  *BGP    Preference: 170/-101
          Route Distinguisher: 10.255.70.103:1
          Next-hop reference count: 7
          Source: 10.255.70.103
          Protocol next hop: 10.255.70.103
          Indirect next hop: 2 no-forward
          State: <Secondary Active Int Ext>
          Local AS:    69 Peer AS:    69

```

```

Age: 1:25:49    Metric2: 1
AIGP 210
Task: BGP_69.10.255.70.103+179
Announcement bits (1): 0-green-l2vpn
AS path: I
Communities: target:11111:1 Layer2-info: encaps:VPLS,
control flags:, mtu: 0
Label-base: 800008, range: 8
Localpref: 100
Router ID: 10.255.70.103
Primary Routing Table bgp.l2vpn.0

10.255.71.52:1:1:1/96 (1 entry, 1 announced)
  *L2VPN Preference: 170/-1
    Next-hop reference count: 5
    Protocol next hop: 10.255.71.52
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:31:40    Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:Site-Down,
    mtu: 0
    Label-base: 800016, range: 8, status-vector: 0x9F

10.255.71.52:1:5:1/96 (1 entry, 1 announced)
  *L2VPN Preference: 170/-101
    Next-hop reference count: 5
    Protocol next hop: 10.255.71.52
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:31:40    Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:, mtu: 0
    Label-base: 800008, range: 8, status-vector: 0x9F

...

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.245.255.63:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000[0]
    Protocol next hop: 10.245.255.63 Indirect next hop: 86af000 296
    State: <Active Int>
    Local AS: 99
    Age: 10:21
    Task: l2 circuit
    Announcement bits (1): 0-LDP
    AS path: I
    VC Label 100000, MTU 1500, VLAN ID 512

inet.0: 45 destinations, 47 routes (44 active, 0 holddown, 1 hidden)
1.1.1.3/32 (1 entry, 1 announced)
  *IS-IS Preference: 18
    Level: 2
    Next hop type: Router, Next hop index: 580

```



```

Address: 0x9db6ed0
Next-hop reference count: 8
Next hop: 10.1.1.6 via lt-1/0/10.5, selected
Session Id: 0x18a
State: <Active Int>
Local AS: 2
Age: 1:32 Metric: 10
Validation State: unverified
ORR Generation-ID: 1
Task: IS-IS
Announcement bits (3): 0-KRT 5-Resolve tree 4 6-Resolve_IGP_FRR
task
AS path: I

inet.0: 61 destinations, 77 routes (61 active, 1 holddown, 0 hidden)
1.1.1.1/32 (2 entries, 1 announced)
*OSPF Preference: 10
Next hop type: Router, Next hop index: 673
Address: 0xc008830
Next-hop reference count: 3
Next hop: 10.1.1.1 via ge-0/0/2.0, selected
Session Id: 0x1b7
State: <Active Int>
Local AS: 1
Age: 3:06:59 Metric: 100
Validation State: unverified
ORR Generation-ID: 1
Area: 0.0.0.0
Task: OSPF
Announcement bits (2): 1-KRT 9-Resolve tree 2
AS path: I

```

show route detail (with BGP Multipath)

```

user@host> show route detail

10.1.1.8/30 (2 entries, 1 announced)
*BGP Preference: 170/-101
Next hop type: Router, Next hop index: 262142
Address: 0x901a010
Next-hop reference count: 2
Source: 10.1.1.2
Next hop: 10.1.1.2 via ge-0/3/0.1, selected
Next hop: 10.1.1.6 via ge-0/3/0.5
State: <Active Ext>
Local AS: 1 Peer AS: 2
Age: 5:04:43
Validation State: unverified
Task: BGP_2.10.1.1.2+59955
Announcement bits (1): 0-KRT
AS path: 2 I
Accepted Multipath
Localpref: 100
Router ID: 172.16.1.2
BGP Preference: 170/-101
Next hop type: Router, Next hop index: 678
Address: 0x8f97520
Next-hop reference count: 9
Source: 10.1.1.6
Next hop: 10.1.1.6 via ge-0/3/0.5, selected
State: <NotBest Ext>

```

```

Inactive reason: Not Best in its group - Active preferred
Local AS:      1 Peer AS:      2
Age: 5:04:43
Validation State: unverified
Task: BGP_2.10.1.1.6+58198
AS path: 2 I
Accepted MultipathContrib
Localpref: 100
Router ID: 172.16.1.3

```

show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```

user@host> show route label 299872 detail
mpls.0: 13 destinations, 13 routes (13 active, 0 holddown, 0 hidden)
299872 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Next-hop reference count: 3
          Address: 0x9097d90
          Next hop: via vt-0/1/0.1
          Next-hop index: 661
          Label operation: Pop
          Address: 0x9172130
          Next hop: via so-0/0/3.0
          Next-hop index: 654
          Label operation: Swap 299872
          State: **Active Int>
          Local AS: 1001
          Age: 8:20      Metric: 1
          Task: LDP
          Announcement bits (1): 0-KRT
          AS path: I
          FECs bound to route: P2MP root-addr 10.255.72.166, grp 232.1.1.1,
src 192.168.142.2

```

show route label detail (Multipoint LDP with Multicast-Only Fast Reroute)

```

user@host> show route label 301568 detail
mpls.0: 18 destinations, 18 routes (18 active, 0 holddown, 0 hidden)
301568 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Address: 0x2735208
          Next-hop reference count: 3
          Next hop type: Router, Next hop index: 1397
          Address: 0x2735d2c
          Next-hop reference count: 3
          Next hop: 1.3.8.2 via ge-1/2/22.0
          Label operation: Pop
          Load balance label: None;
          Next hop type: Router, Next hop index: 1395
          Address: 0x2736290
          Next-hop reference count: 3
          Next hop: 1.3.4.2 via ge-1/2/18.0
          Label operation: Pop
          Load balance label: None;
          State: <Active Int AckRequest MulticastRPF>
          Local AS: 10
          Age: 54:05      Metric: 1

```

```
Validation State: unverified
Task: LDP
Announcement bits (1): 0-KRT
AS path: I
FECs bound to route: P2MP root-addr 172.16.1.1, grp: 232.1.1.1,
src: 192.168.219.11
Primary Upstream : 172.16.1.3:0--172.16.1.2:0
  RPF Nexthops :
    ge-1/2/15.0, 1.2.94.1, Label: 301568, weight: 0x1
    ge-1/2/14.0, 1.2.3.1, Label: 301568, weight: 0x1
Backup Upstream : 172.16.1.3:0--172.16.1.6:0
  RPF Nexthops :
    ge-1/2/20.0, 1.2.96.1, Label: 301584, weight: 0xffff
    ge-1/2/19.0, 1.3.6.1, Label: 301584, weight: 0xffff
```

show route exact

List of Syntax	Syntax on page 552 Syntax (EX Series Switches) on page 552
Syntax	<code>show route exact <i>destination-prefix</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route exact <i>destination-prefix</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display only the routes that exactly match the specified address or range of addresses.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . <i>destination-prefix</i> —Address or range of addresses. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
List of Sample Output	show route exact on page 552 show route exact detail on page 553 show route exact extensive on page 553 show route exact terse on page 553
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route exact

```
user@host> show route exact 207.17.136.0/24

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
207.17.136.0/24    *[Static/5] 2d 03:30:22
                  > to 192.168.71.254 via fxp0.0
```

show route exact detail

```

user@host> show route exact 207.17.136.0/24 detail

inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
207.17.136.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2d 3:30:26
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

```

show route exact extensive

```

user@host> show route exact 207.17.136.0/24 extensive

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
207.17.136.0/24 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.0/24 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 1:25:18
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

```

show route exact terse

```

user@host> show route exact 207.17.136.0/24 terse

inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both
A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* 207.17.136.0/24  S  5                >192.168.71.254

```

show route export

List of Syntax	Syntax on page 554 Syntax (EX Series Switches) on page 554
Syntax	<pre>show route export <brief detail> <instance <instance-name> routing-table-name> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show route export <brief detail> <instance <instance-name> routing-table-name></pre>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display policy-based route export information. Policy-based export simplifies the process of exchanging route information between routing instances.
Options	<p>none—(Same as brief.) Display standard information about policy-based export for all instances and routing tables on all systems.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>instance <instance-name>—(Optional) Display a particular routing instance for which policy-based export is currently enabled.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>routing-table-name—(Optional) Display information about policy-based export for all routing tables whose name begins with this string (for example, inet.0 and inet6.0 are both displayed when you run the show route export inet command).</p>
Required Privilege Level	view
List of Sample Output	show route export on page 555 show route export detail on page 555 show route export instance detail on page 556
Output Fields	Table 23 on page 336 lists the output fields for the show route export command. Output fields are listed in the approximate order in which they appear.

Table 44: show route export Output Fields

Field Name	Field Description	Level of Output
Table or <i>table-name</i>	Name of the routing tables that either import or export routes.	All levels
Routes	Number of routes exported from this table into other tables. If a particular route is exported to different tables, the counter will only increment by one.	brief none
Export	Whether the table is currently exporting routes to other tables: Y or N (Yes or No).	brief none
Import	Tables currently importing routes from the originator table. (Not displayed for tables that are not exporting any routes.)	detail
Flags	(instance keyword only) Flags for this feature on this instance: <ul style="list-style-type: none"> config auto-policy—The policy was deduced from the configured IGP export policies. cleanup—Configuration information for this instance is no longer valid. config—The instance was explicitly configured. 	detail
Options	(instance keyword only) Configured option displays the type of routing tables the feature handles: <ul style="list-style-type: none"> unicast—Indicates <i>instance.inet.0</i>. multicast—Indicates <i>instance.inet.2</i>. unicast multicast—Indicates <i>instance.inet.0</i> and <i>instance.inet.2</i>. 	detail
Import policy	(instance keyword only) Policy that route export uses to construct the import-export matrix. Not displayed if the instance type is vrf .	detail
Instance	(instance keyword only) Name of the routing instance.	detail
Type	(instance keyword only) Type of routing instance: forwarding , non-forwarding , or vrf .	detail

Sample Output

show route export

```

user@host> show route export
Table           Export      Routes
inet.0          N           0
black.inet.0    Y           3
red.inet.0      Y           4

```

show route export detail

```

user@host> show route export detail
inet.0                      Routes:      0
black.inet.0                Routes:      3
    Import: [ inet.0 ]
red.inet.0                  Routes:      4
    Import: [ inet.0 ]

```

show route export instance detail

```
user@host> show route export instance detail
Instance: master                               Type: forwarding
  Flags: <config auto-policy> Options: <unicast multicast>
  Import policy: [ (ospf-master-from-red || isis-master-from-black) ]
Instance: black                               Type: non-forwarding
Instance: red                                 Type: non-forwarding
```


show route extensive

List of Syntax	Syntax on page 557 Syntax (EX Series Switches) on page 557
Syntax	<pre>show route extensive <destination-prefix> <logical-system (all logical-system-name)></pre>
Syntax (EX Series Switches)	<pre>show route extensive <destination-prefix></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>
Description	Display extensive information about the active entries in the routing tables.
Options	<p>none—Display all active entries in the routing table.</p> <p>destination-prefix—(Optional) Display active entries for the specified address or range of addresses.</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route extensive on page 564 show route extensive (Access Route) on page 571 show route extensive (BGP PIC Edge) on page 571 show route extensive (FRR and LFA) on page 572 show route extensive (IS-IS) on page 573 show route extensive (Route Reflector) on page 573 show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 573 show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 574
Output Fields	<p>Table 24 on page 338 describes the output fields for the show route extensive command. Output fields are listed in the approximate order in which they appear.</p>

Table 45: show route extensive Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). • hidden (routes that are not used because of a routing policy).
<i>route-destination</i> (entry, announced)	<p>Route destination (for example: 10.0.0.1/24). The entry value is the number of route for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote.
TSI	Protocol header information.
label stacking	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of two or more exits this router with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).
[protocol, preference]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
Level	(IS-IS only). In IS-IS, a single autonomous system (AS) can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).
Next-hop type	Type of next hop. For a description of possible values for this field, see the Output Field table in the show route detail command.
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path lsp-path-name	Name of the LSP used to reach the next hop.
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Offset	Whether the metric has been increased or decreased by an offset value.
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to recursively derive a forwarding next hop.

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>label-operation</i>	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Indirect next hops	<p>When present, a list of nodes that are used to resolve the path to the next-hop destination, in the order that they are resolved.</p> <p>When BGP PIC Edge is enabled, the output lines that contain Indirect next hop: weight follow next hops that the software can use to repair paths where a link failure occurs. The next-hop weight has one of the following values:</p> <ul style="list-style-type: none">• 0x1 indicates active next hops.• 0x4000 indicates passive next hops.
State	State of the route (a route can be in more than one state). See the Output Field table in the show route detail command.
Session ID	The BFD session ID number that represents the protection using MPLS fast reroute (FRR) and loop-free alternate (LFA).
Weight	<p>Weight for the backup path. If the weight of an indirect next hop is larger than zero, the weight value is shown.</p> <p>For sample output, see show route table.</p>

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
Inactive reason	<p>If the route is inactive, the reason for its current state is indicated. Typical reasons include:</p> <ul style="list-style-type: none"> • Active preferred—Currently active route was selected over this route. • Always compare MED—Path with a lower multiple exit discriminator (MED) is available. • AS path—Shorter AS path is available. • Cisco Non-deterministic MED selection—Cisco nondeterministic MED is enabled and a path with a lower MED is available. • Cluster list length—Path with a shorter cluster list length is available. • Forwarding use only—Path is only available for forwarding purposes. • IGP metric—Path through the next hop with a lower IGP metric is available. • IGP metric type—Path with a lower OSPF link-state advertisement type is available. • Interior > Exterior > Exterior via Interior—Direct, static, IGP, or EBGP path is available. • Local preference—Path with a higher local preference value is available. • Next hop address—Path with a lower metric next hop is available. • No difference—Path from a neighbor with a lower IP address is available. • Not Best in its group—Occurs when multiple peers of the same external AS advertise the same prefix and are grouped together in the selection process. When this reason is displayed, an additional reason is provided (typically one of the other reasons listed). • Number of gateways—Path with a higher number of next hops is available. • Origin—Path with a lower origin code is available. • OSPF version—Path does not support the indicated OSPF version. • RIB preference—Route from a higher-numbered routing table is available. • Route distinguisher—64-bit prefix added to IP subnets to make them unique. • Route metric or MED comparison—Route with a lower metric or MED is available. • Route preference—Route with a lower preference value is available. • Router ID—Path through a neighbor with a lower ID is available. • Unusable path—Path is not usable because of one of the following conditions: the route is damped, the route is rejected by an import policy, or the route is unresolved. • Update source—Last tiebreaker is the lowest IP address value.
Local AS	Autonomous system (AS) number of the local routing device.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	<p>For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances.</p> <p>For sample output, see show route table.</p>

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
Task	Name of the protocol that has added the route.
Announcement bits	<p>List of protocols that are consumers of the route. Using the following output as an example, Announcement bits (3): 0-KRT 5-Resolve tree 2 8-BGP RT Background there are (3) announcement bits to reflect the three clients (protocols) that have state for this route: Kernel (0-KRT), 5 (resolution tree process 2), and 8 (BGP).</p> <p>The notation <i>n</i>-Resolve inet indicates that the route is used for route resolution for next hops found in the routing table. <i>n</i> is an index used by Juniper Networks customer support only.</p>
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • Recorded—The AS path is recorded by the sample process (sampled). • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
FECs bound to route	Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
AS path: I <Originator>	(For route reflected output only) Originator ID attribute set by the route reflector.

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
route status	Indicates the status of a BGP route: <ul style="list-style-type: none"> • Accepted—The specified BGP route is imported by the default BGP policy. • Import—The route is imported into a Layer 3 VPN routing instance. • Import-Protect—A remote instance egress that is protected. • Multipath—A BGP multipath active route. • MultipathContrib—The route is not active but contributes to the BGP multipath. • Protect—An egress route that is protected. • Stale—A route that is marked stale due to graceful restart.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.
Originator ID	(For route reflected output only) Address of router that originally sent the route to the route reflector.
Prefixes bound to route	Forwarding Equivalent Class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See the Output Field table in the show route detail command for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down.
mtu	Maximum transmission unit (MTU) information.
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.

Table 45: show route extensive Output Fields (*continued*)

Field Name	Field Description
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.
Originating RIB	Name of the routing table whose active route was used to determine the forwarding next-hop entry in the resolution database. For example, in the case of inet.0 resolving through inet.0 and inet.3, this field indicates which routing table, inet.0 or inet.3, provided the best path for a particular prefix.
Node path count	Number of nodes in the path.
Forwarding nexthops	Number of forwarding next hops. The forwarding next hop is the network layer address of the directly reachable neighboring system (if applicable) and the interface used to reach it.

Sample Output

show route extensive

```

user@host> show route extensive
inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
203.0.113.10/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.10/16 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 64496
    Age: 1:34:06
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

203.0.113.30/30 (2 entries, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 2
    Next hop: via so-0/3/0.0, selected
    State: <Active Int>
    Local AS: 64496
    Age: 1:32:40
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I
  OSPF Preference: 10
    Next-hop reference count: 1
    Next hop: via so-0/3/0.0, selected

```



```

        State: <Int>
        Inactive reason: Route Preference
        Local AS: 64496
        Age: 1:32:40 Metric: 1
        Area: 0.0.0.0
        Task: OSPF
        AS path: I

203.0.113.103/32 (1 entry, 1 announced)
    *Local Preference: 0
        Next hop type: Local
        Next-hop reference count: 7
        Interface: so-0/3/0.0
        State: <Active NoReadvrt Int>
        Local AS: 644969
        Age: 1:32:43
        Task: IF
        Announcement bits (1): 3-Resolve tree 2
        AS path: I

...

203.0.113.203/30 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.203/30 -> {203.0.113.216}
    *OSPF Preference: 10
        Next-hop reference count: 9
        Next hop: via so-0/3/0.0
        Next hop: 203.0.113.216 via ge-3/1/0.0, selected
        State: <Active Int>
        Local AS: 64496
        Age: 1:32:19 Metric: 2
        Area: 0.0.0.0
        Task: OSPF
        Announcement bits (2): 0-KRT 3-Resolve tree 2
        AS path: I

...

198.51.100.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.2/32 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08
        Task: PIM Recv
        Announcement bits (2): 0-KRT 3-Resolve tree 2
        AS path: I

...

198.51.100.22/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.22/32 -> {}
    *IGMP Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:06

```

```

Task: IGMP
Announcement bits (2): 0-KRT 3-Resolve tree 2
AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

203.0.113.103/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
Label-switched-path green-r1-r3
Label operation: Push 100096
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 2
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

203.0.113.238/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: via so-0/3/0.0 weight 0x1, selected
Label-switched-path green-r1-r2
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 1
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

...

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

47.0005.80ff.f800.0000.0108.0001.0102.5507.1052/152 (1 entry, 0 announced)
*Direct Preference: 0
Next hop type: Interface
Next-hop reference count: 1
Next hop: via lo0.0, selected
State: <Active Int>
Local AS: 64496
Age: 1:34:07
Task: IF
AS path: I

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

0 (1 entry, 1 announced)
TSI:
KRT in-kernel 0 /36 -> {}
*MPLS Preference: 0
Next hop type: Receive
Next-hop reference count: 6
State: <Active Int>
Local AS: 64496
Age: 1:34:08 Metric: 1

```

```

Task: MPLS
Announcement bits (1): 0-KRT
AS path: I

...

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
299840 (1 entry, 1 announced)
TSI:
KRT in-kernel 299840 /52 -> {indirect(1048575)}
    *RSVP   Preference: 7/2
            Next hop type: Flood
            Address: 0x9174a30
            Next-hop reference count: 4
            Next hop type: Router, Next hop index: 798
            Address: 0x9174c28
            Next-hop reference count: 2
            Next hop: 198.51.100.2 via lt-1/2/0.9 weight 0x1
            Label-switched-path R2-to-R4-2p2mp
            Label operation: Pop
            Next hop type: Router, Next hop index: 1048574
            Address: 0x92544f0
            Next-hop reference count: 2
            Next hop: 198.51.100.2 via lt-1/2/0.7 weight 0x1
            Label-switched-path R2-to-R200-p2mp
            Label operation: Pop
            Next hop: 198.51.100.2 via lt-1/2/0.5 weight 0x8001
            Label operation: Pop
            State: <Active Int>
            Age: 1:29      Metric: 1
            Task: RSVP
            Announcement bits (1): 0-KRT
            AS path: I...

800010 (1 entry, 1 announced)
TSI:
KRT in-kernel 800010 /36 -> {vt-3/2/0.32769}
    *VPLS   Preference: 7
            Next-hop reference count: 2
            Next hop: via vt-3/2/0.32769, selected
            Label operation: Pop
            State: <Active Int>
            Age: 1:31:53
            Task: Common L2 VC
            Announcement bits (1): 0-KRT
            AS path: I

vt-3/2/0.32769 (1 entry, 1 announced)
TSI:
KRT in-kernel vt-3/2/0.32769.0 /16 -> {indirect(1048574)}
    *VPLS   Preference: 7
            Next-hop reference count: 2
            Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
            Label-switched-path green-r1-r3
            Label operation: Push 800012, Push 100096(top)
            Protocol next hop: 203.0.113.103
            Push 800012
            Indirect next hop: 87272e4 1048574
            State: <Active Int>
            Age: 1:31:53      Metric2: 2

```

```

Task: Common L2 VC
Announcement bits (2): 0-KRT 1-Common L2 VC
AS path: I
Communities: target:11111:1 Layer2-info: encaps:VPLS,
control flags:, mtu: 0
Indirect next hops: 1
    Protocol next hop: 203.0.113.103 Metric: 2
    Push 800012
    Indirect next hop: 87272e4 1048574
    Indirect path forwarding next hops: 1
        Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1

203.0.113.103/32 Originating RIB: inet.3
    Metric: 2                               Node path count: 1
    Forwarding nexthops: 1
        Nexthop: 203.0.113.216 via ge-3/1/0.0

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

2001:db8::10:255:71:52/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

ff02::2/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::2/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08
        Task: PIM Recv6
        Announcement bits (1): 0-KRT
        AS path: I

ff02::d/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::d/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08

```

```

Task: PIM Recv6
Announcement bits (1): 0-KRT
AS path: I

ff02::16/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::16/128 -> {}
  *MLD Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 64496
    Age: 1:34:06
    Task: MLD
    Announcement bits (1): 0-KRT
    AS path: I

private.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 1
    Next hop: via lo0.16385, selected
    State: <Active NoReadvrt Int>
    Age: 1:34:07
    Task: IF
    AS path: I

green.l2vpn.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

203.0.113.103:1:3:1/96 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 203.0.113.103:1
    Next-hop reference count: 7
    Source: 203.0.113.103
    Protocol next hop: 203.0.113.103
    Indirect next hop: 2 no-forward
    State: <Secondary Active Int Ext>
    Local AS: 64496 Peer AS: 64496
    Age: 1:28:12 Metric2: 1
    Task: BGP_69.203.0.113.103+179
    Announcement bits (1): 0-green-l2vpn
    AS path: I
    Communities: target:11111:1 Layer2-info: encaps:VPLS,
    control flags:, mtu: 0
    Label-base: 800008, range: 8
    Localpref: 100
    Router ID: 203.0.113.103
    Primary Routing Table bgp.l2vpn.0

203.0.113.152:1:1:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699540
  *L2VPN Preference: 170/-1
    Next-hop reference count: 5
    Protocol next hop: 203.0.113.152
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:34:03 Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179

```

```

AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down,
mtu: 0
Label-base: 800016, range: 8, status-vector: 0x9F

203.0.113.152:1:5:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699528
  *L2VPN Preference: 170/-101
    Next-hop reference count: 5
    Protocol next hop: 203.0.113.152
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:34:03 Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:, mtu: 0
    Label-base: 800008, range: 8, status-vector: 0x9F

...

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
TSI:

203.0.113.163:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000[0]
    Protocol next hop: 203.0.113.163 Indirect next hop: 86af000 296
    State: <Active Int>
    Local AS: 64499
    Age: 10:21
    Task: l2 circuit
    Announcement bits (1): 0-LDP
    AS path: I
    VC Label 100000, MTU 1500, VLAN ID 512

203.0.113.55/24 (1 entry, 1 announced)
TSI:
KRT queued (pending) add
  198.51.100.0/24 -> {Push 300112}
    *BGP Preference: 170/-101
      Next hop type: Router
      Address: 0x925c208
      Next-hop reference count: 2
      Source: 203.0.113.9
      Next hop: 203.0.113.9 via ge-1/2/0.15, selected
      Label operation: Push 300112
      Label TTL action: prop-ttl
      State: <Active Ext>
      Local AS: 64509 Peer AS: 65539
      Age: 1w0d 23:06:56
      AIGP: 25
      Task: BGP_65539.203.0.113.9+56732
      Announcement bits (1): 0-KRT
      AS path: 65539 64508 I
      Accepted

```

```

Route Label: 300112
Localpref: 100
Router ID: 213.0.113.99

```

show route extensive (Access Route)

```

user@host> show route 203.0.113.102 extensive
inet.0: 39256 destinations, 39258 routes (39255 active, 0 holddown, 1 hidden)
203.0.113.102/32 (1 entry, 1 announced)
TSI:
KRT in-kerne1 203.0.113.102/32 -> {192.0.2.2}
OSPF area : 0.0.0.0, LSA ID : 203.0.113.102, LSA type : Extern
  *Access Preference: 13
    Next-hop reference count: 78472
    Next hop: 192.0.2.2 via fe-0/0/0.0, selected
    State: <Active Int>
  Age: 12
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 1-OSPFv2
    AS path: I

```

```

user@host> show route 2001:db8:4641:1::/48 extensive

inet6.0: 75 destinations, 81 routes (75 active, 0 holddown, 0 hidden)
2001:db8:4641:1::/48 (1 entry, 1 announced)
TSI:
KRT in-kerne1 2001:db8:4641:1::/48 -> {#0 0.13.1.0.0.1}
  *Access Preference: 13
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I
2001:db8:4641:1::/128 (1 entry, 1 announced)
TSI:
KRT in-kerne1 2001:db8:4641:1::/128 -> {#0 0.13.1.0.0.1}
  *Access-internal Preference: 12
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I

```

show route extensive (BGP PIC Edge)

```

user@host> show route 198.51.100.6 extensive
ed.inet.0: 6 destinations, 9 routes (6 active, 0 holddown, 0 hidden)
198.51.100.6/32 (3 entries, 2 announced)

```

```

        State: <CalcForwarding>
TSI:
KRT in-kerne1 198.51.100.6/32 -> {indirect(1048574), indirect(1048577)}
Page 0 idx 0 Type 1 val 9219e30
  Nexthop: Self
  AS path: [2] 3 I
  Communities: target:2:1
Path 198.51.100.6 from 198.51.100.4 Vector len 4. Val: 0
..
    #Multipath Preference: 255
      Next hop type: Indirect
      Address: 0x93f4010
      Next-hop reference count: 2
..
      Protocol next hop: 198.51.1001.4
      Push 299824
      Indirect next hop: 944c000 1048574 INH Session ID: 0x3
      Indirect next hop: weight 0x1
      Protocol next hop: 198.51.100.5
      Push 299824
      Indirect next hop: 944c1d8 1048577 INH Session ID: 0x4
      Indirect next hop: weight 0x4000
      State: <ForwardingOnly Int Ext>
      Inactive reason: Forwarding use only
      Age: 25          Metric2: 15
      Validation State: unverified
      Task: RT
      Announcement bits (1): 0-KRT
      AS path: 3 I
      Communities: target:2:1

```

show route extensive (FRR and LFA)

```

user@host> show route 203.0.113.20 extensive
inet.0: 46 destinations, 49 routes (45 active, 0 holddown, 1 hidden)
203.0.113.20/24 (2 entries, 1 announced)
  State: FlashAll
TSI:
KRT in-kerne1 203.0.113.20/24 -> {Push 299776, Push 299792}
  *RSVP Preference: 7/1
    Next hop type: Router, Next hop index: 1048574
    Address: 0xbbbc010
    Next-hop reference count: 5
    Next hop: 203.0.113.112 via ge-2/1/8.0 weight 0x1, selected
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299776
    Label TTL action: prop-ttl
    Session Id: 0x201
    Next hop: 203.0.113.122 via ge-2/1/4.0 weight 0x4001
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299792
    Label TTL action: prop-ttl
    Session Id: 0x202
    State: Active Int
    Local AS: 64500
    Age: 5:31 Metric: 2
    Task: RSVP
    Announcement bits (1): 0-KRT
    AS path: I
  OSPF Preference: 10
    Next hop type: Router, Next hop index: 615

```



```

Address: 0xb9d78c4
Next-hop reference count: 7
Next hop: 203.0.113.112 via ge-2/1/8.0, selected
Session Id: 0x201
State: Int
Inactive reason: Route Preference
Local AS: 64500
Age: 5:35 Metric: 3
Area: 0.0.0.0
Task: OSPF
AS path: I

```

show route extensive (IS-IS)

```

user@host> show route extensive
IS-IS Preference: 15
Level: 1
Next hop type: Router, Next hop index: 1048577
Address: 0xFFFFFFFF
Next-hop reference count: YY
Next hop: 203.0.113.22 via ae1.0 balance 43%, selected
Session Id: 0x141
Next hop: 203.0.113.22 via ae0.0 balance 57%

```

show route extensive (Route Reflector)

```

user@host> show route extensive
203.0.113.0/8 (1 entry, 1 announced)

TSI:
KRT in-kernel 203.0.113.0/8 -> {indirect(40)}
*BGP Preference: 170/-101
Source: 192.168.4.214
Protocol next hop: 198.51.100.192 Indirect next hop: 84ac908 40
State: <Active Int Ext>
Local AS: 65548 Peer AS: 65548
Age: 3:09 Metric: 0 Metric2: 0
Task: BGP_65548.192.168.4.214+1033
Announcement bits (2): 0-KRT 4-Resolve inet.0
AS path: 65544 64507 I <Originator>
Cluster list: 198.51.100.1
Originator ID: 203.0.113.88
Communities: 7777:7777
Localpref: 100
Router ID: 203.0.113.4
Indirect next hops: 1
Protocol next hop: 203.0.113.192 Metric: 0
Indirect next hop: 84ac908 40
Indirect path forwarding next hops: 0
Next hop type: Discard

```

show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```

user@host> show route label 299872 detail
mpls.0: 13 destinations, 13 routes (13 active, 0 holddown, 0 hidden)
299872 (1 entry, 1 announced)
*LDP Preference: 9
Next hop type: Flood
Next-hop reference count: 3
Address: 0x9097d90

```

```

Next hop: via vt-0/1/0.1
Next-hop index: 661
Label operation: Pop
Address: 0x9172130
Next hop: via so-0/0/3.0
Next-hop index: 654
Label operation: Swap 299872
State: **Active Int>
Local AS: 64511
Age: 8:20      Metric: 1
Task: LDP
Announcement bits (1): 0-KRT
AS path: I
FECs bound to route: P2MP root-addr 203.0.113.166, grp 203.0.1.1,
src 192.168.142.2

```

show route label detail (Multipoint LDP with Multicast-Only Fast Reroute)

```

user@host> show route label 301568 detail

mpls.0: 18 destinations, 18 routes (18 active, 0 holddown, 0 hidden)
301568 (1 entry, 1 announced)
  *LDP    Preference: 9
          Next hop type: Flood
          Address: 0x2735208
          Next-hop reference count: 3
          Next hop type: Router, Next hop index: 1397
          Address: 0x2735d2c
          Next-hop reference count: 3
          Next hop: 203.0.113.82 via ge-1/2/22.0
          Label operation: Pop
          Load balance label: None;
          Next hop type: Router, Next hop index: 1395
          Address: 0x2736290
          Next-hop reference count: 3
          Next hop: 203.0.113.2 via ge-1/2/18.0
          Label operation: Pop
          Load balance label: None;
          State: <Active Int AckRequest MulticastRPF>
          Local AS: 64500
          Age: 54:05      Metric: 1
          Validation State: unverified
          Task: LDP
          Announcement bits (1): 0-KRT
          AS path: I
          FECs bound to route: P2MP root-addr 198.51.100.1, grp: 232.1.1.1,
src: 192.168.219.11
          Primary Upstream : 198.51.100.3:0--198.51.100.2:0
          RPF Nexthops :
              ge-1/2/15.0, 1.2.94.1, Label: 301568, weight: 0x1
              ge-1/2/14.0, 1.2.3.1, Label: 301568, weight: 0x1
          Backup Upstream : 198.51.100.3:0--198.51.100.6:0
          RPF Nexthops :
              ge-1/2/20.0, 198.51.100.96, Label: 301584, weight: 0xffffe
              ge-1/2/19.0, 198.51.100.36, Label: 301584, weight: 0xffffe

```

show route forwarding-table

List of Syntax [Syntax on page 575](#)
 [Syntax \(MX Series Routers\) on page 575](#)
 [Syntax \(TX Matrix and TX Matrix Plus Routers\) on page 575](#)

Syntax show route forwarding-table
 <detail | extensive | summary>
 <all>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <label *name*>
 <matching *matching*>
 <multicast>
 <table (default | *logical-system-name/routing-instance-name* | *routing-instance-name*)>
 <vlan (all | *vlan-name*)>
 <vpn *vpn*>

Syntax (MX Series Routers) show route forwarding-table
 <detail | extensive | summary>
 <all>
 <bridge-domain (all | *domain-name*)>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <label *name*>
 <learning-vlan-id *learning-vlan-id*>
 <matching *matching*>
 <multicast>
 <table (default | *logical-system-name/routing-instance-name* | *routing-instance-name*)>
 <vlan (all | *vlan-name*)>
 <vpn *vpn*>

Syntax (TX Matrix and TX Matrix Plus Routers) show route forwarding-table
 <detail | extensive | summary>
 <all>
 <ccc *interface-name*>
 <destination *destination-prefix*>
 <family *family* | matching *matching*>
 <interface-name *interface-name*>
 <matching *matching*>
 <label *name*>
 <lcc *number*>
 <multicast>
 <table *routing-instance-name*>
 <vpn *vpn*>

Release Information Command introduced before Junos OS Release 7.4.
 Option **bridge-domain** introduced in Junos OS Release 7.5

Option **learning-vlan-id** introduced in Junos OS Release 8.4

Options **all** and **vlan** introduced in Junos OS Release 9.6.

Command introduced in Junos OS Release 11.3 for the QFX Series.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display the Routing Engine's forwarding table, including the network-layer prefixes and their next hops. This command is used to help verify that the routing protocol process has relayed the correction information to the forwarding table. The Routing Engine constructs and maintains one or more routing tables. From the routing tables, the Routing Engine derives a table of active routes, called the forwarding table.



NOTE: The Routing Engine copies the forwarding table to the Packet Forwarding Engine, the part of the router that is responsible for forwarding packets. To display the entries in the Packet Forwarding Engine's forwarding table, use the **show pfe route** command.

Options **none**—Display the routes in the forwarding tables. By default, the **show route forwarding-table** command does not display information about private, or internal, forwarding tables.

detail | extensive | summary—(Optional) Display the specified level of output.

all—(Optional) Display routing table entries for all forwarding tables, including private, or internal, tables.

bridge-domain (all | bridge-domain-name)—(MX Series routers only) (Optional) Display route entries for all bridge domains or the specified bridge domain.

ccc interface-name—(Optional) Display route entries for the specified circuit cross-connect interface.

destination destination-prefix—(Optional) Destination prefix.

family family—(Optional) Display routing table entries for the specified family: **bridge** (ccc | destination | detail | extensive | interface-name | label | learning-vlan-id | matching | multicast | summary | table | vlan | vpn), **ethernet-switching**, **evpn**, **fibre-channel**, **fmembers**, **inet**, **inet6**, **iso**, **mcsnoop-inet**, **mcsnoop-inet6**, **mpls**, **satellite-inet**, **satellite-inet6**, **satellite-vpls**, **tnp**, **unix**, **vpls**, or **vlan-classification**.

interface-name interface-name—(Optional) Display routing table entries for the specified interface.

label name—(Optional) Display route entries for the specified label.

lcc number—(TX Matrix and TX matrix Plus routers only) (Optional) On a routing matrix composed of a TX Matrix router and T640 routers, display information for the specified T640 router (or line-card chassis) connected to the TX Matrix router. On a routing matrix composed of the TX Matrix Plus router and T1600 or T4000 routers,

display information for the specified router (line-card chassis) connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

learning-vlan-id *learning-vlan-id*—(MX Series routers only) (Optional) Display learned information for all VLANs or for the specified VLAN.

matching *matching*—(Optional) Display routing table entries matching the specified prefix or prefix length.

multicast—(Optional) Display routing table entries for multicast routes.

table —(Optional) Display route entries for all the routing tables in the main routing instance or for the specified routing instance. If your device supports logical systems, you can also display route entries for the specified logical system and routing instance. To view the routing instances on your device, use the [show route instance](#) command.

vlan (**all** | *vlan-name*)—(Optional) Display information for all VLANs or for the specified VLAN.

vpn *vpn*—(Optional) Display routing table entries for a specified VPN.

Required Privilege Level

view

List of Sample Output

[show route forwarding-table on page 582](#)
[show route forwarding-table detail on page 583](#)
[show route forwarding-table destination extensive \(Weights and Balances\) on page 583](#)
[show route forwarding-table extensive on page 584](#)
[show route forwarding-table extensive \(RPF\) on page 585](#)
[show route forwarding-table \(dynamic list next hop\) on page 586](#)
[show route forwarding-table family mpls on page 587](#)
[show route forwarding-table family mpls ccc ge-0/0/1.1004 on page 587](#)
[show route forwarding-table family vpls on page 587](#)
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled\) on page 587](#)
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled with MAC Statistics\) on page 588](#)
[show route forwarding-table family vpls extensive on page 588](#)

[show route forwarding-table table default on page 589](#)

[show route forwarding-table table](#)

[logical-system-name/routing-instance-name on page 590](#)

[show route forwarding-table vpn on page 591](#)

Output Fields [Table 25 on page 359](#) lists the output fields for the **show route forwarding-table** command. Output fields are listed in the approximate order in which they appear. Field names might be abbreviated (as shown in parentheses) when no level of output is specified, or when the **detail** keyword is used instead of the **extensive** keyword.

Table 46: show route forwarding-table Output Fields

Field Name	Field Description	Level of Output
Logical system	Name of the logical system. This field is displayed if you specify the table <i>logical-system-name/routing-instance-name</i> option on a device that is configured for and supports logical systems.	All levels
Routing table	Name of the routing table (for example, inet, inet6, mpls).	All levels

Table 46: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Enabled protocols	<p>The features and protocols that have been enabled for a given routing table. This field can contain the following values:</p> <ul style="list-style-type: none"> • BUM hashing—BUM hashing is enabled. • MAC Stats—Mac Statistics is enabled. • Bridging—Routing instance is a normal layer 2 bridge. • No VLAN—No VLANs are associated with the bridge domain. • All VLANs—The vlan-id all statement has been enabled for this bridge domain. • Single VLAN—Single VLAN ID is associated with the bridge domain. • MAC action drop—New MACs will be dropped when the MAC address limit is reached. • Dual VLAN—Dual VLAN tags are associated with the bridge domain • No local switching—No local switching is enabled for this routing instance.. • Learning disabled—Layer 2 learning is disabled for this routing instance. • MAC limit reached—The maximum number of MAC addresses that was configured for this routing instance has been reached. • VPLS—The VPLS protocol is enabled. • No IRB I2-copy—The no-irb-layer-2-copy feature is enabled for this routing instance. • ACKed by all peers—All peers have acknowledged this routing instance. • BUM Pruning—BUM pruning is enabled on the VPLS instance. • Def BD VXLAN—VXLAN is enabled for the default bridge domain. • EVPN—EVPN protocol is enabled for this routing instance. • Def BD OVSDb—Open vSwitch Database (OVSDb) is enabled on the default bridge domain. • Def BD Ingress replication—VXLAN ingress node replication is enabled on the default bridge domain. • L2 backhaul—Layer 2 backhaul is enabled. • FRR optimize—Fast reroute optimization • MAC pinning—MAC pinning is enabled for this bridge domain. • MAC Aging Timer—The MAC table aging time is set per routing instance. • EVPN VXLAN—This routing instance supports EVPN with VXLAN encapsulation. • PBBN—This routing instance is configured as a provider backbone bridged network. • PBN—This routing instance is configured as a provider bridge network. • ETREE—The ETREE protocol is enabled on this EVPN routing instance. • ARP/NDP suppression—EVPN ARP NDP suppression is enabled in this routing instance. • Def BD EVPN VXLAN—EVPN VXLAN is enabled for the default bridge domain. • MPLS control word—Control word is enabled for this MPLS routing instance. 	All levels
Address family	Address family (for example, IP, IPv6, ISO, MPLS, and VPLS).	All levels
Destination	Destination of the route.	detail extensive

Table 46: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Route Type (Type)	<p>How the route was placed into the forwarding table. When the detail keyword is used, the route type might be abbreviated (as shown in parentheses):</p> <ul style="list-style-type: none"> • cloned (clon)—(TCP or multicast only) Cloned route. • destination (dest)—Remote addresses directly reachable through an interface. • destination down (iddn)—Destination route for which the interface is unreachable. • interface cloned (ifcl)—Cloned route for which the interface is unreachable. • route down (ifdn)—Interface route for which the interface is unreachable. • ignore (ignr)—Ignore this route. • interface (intf)—Installed as a result of configuring an interface. • permanent (perm)—Routes installed by the kernel when the routing table is initialized. • user—Routes installed by the routing protocol process or as a result of the configuration. 	All levels
Route Reference (RtRef)	Number of routes to reference.	detail extensive
Flags	<p>Route type flags:</p> <ul style="list-style-type: none"> • none—No flags are enabled. • accounting—Route has accounting enabled. • cached—Cache route. • incoming-iface interface-number—Check against incoming interface. • prefix load balance—Load balancing is enabled for this prefix. • rt nh decoupled—Route has been decoupled from the next hop to the destination. • sent to PFE—Route has been sent to the Packet Forwarding Engine. • static—Static route. 	extensive
Next hop	IP address of the next hop to the destination.	detail extensive

Table 46: show route forwarding-table Output Fields (*continued*)

Field Name	Field Description	Level of Output
Next hop Type (Type)	<p>Next-hop type. When the detail keyword is used, the next-hop type might be abbreviated (as indicated in parentheses):</p> <ul style="list-style-type: none"> • broadcast (bcst)—Broadcast. • deny—Deny. • discard (dscd)—Discard. • hold—Next hop is waiting to be resolved into a unicast or multicast type. • indexed (idxd)—Indexed next hop. • indirect (indr)—Indirect next hop. • local (locl)—Local address on an interface. • routed multicast (mcrst)—Regular multicast next hop. • multicast (mcst)—Wire multicast next hop (limited to the LAN). • multicast discard (mdsc)—Multicast discard. • multicast group (mgrp)—Multicast group member. • receive (rcv)—Receive. • reject (rjct)—Discard. An ICMP unreachable message was sent. • resolve (rslv)—Resolving the next hop. • unicast (ucst)—Unicast. • unilist (ulst)—List of unicast next hops. A packet sent to this next hop goes to any next hop in the list. 	detail extensive
Index	Software index of the next hop that is used to route the traffic for a given prefix.	detail extensive none
Route interface-index	Logical interface index from which the route is learned. For example, for interface routes, this is the logical interface index of the route itself. For static routes, this field is zero. For routes learned through routing protocols, this is the logical interface index from which the route is learned.	extensive
Reference (NhRef)	Number of routes that refer to this next hop.	detail extensive none
Next-hop interface (Netif)	Interface used to reach the next hop.	detail extensive none
Weight	Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible (see the Balance field description).	extensive
Balance	Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a router is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.	extensive
RPF interface	List of interfaces from which the prefix can be accepted. Reverse path forwarding (RPF) information is displayed only when rpf-check is configured on the interface.	extensive

Sample Output

show route forwarding-table

```

user@host> show route forwarding-table
Routing table: default.inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0                rjct   46    4
0.0.0.0/32       perm  0                dscd   44    1
172.16.1.0/24    ifdn  0                rslv   608    1 ge-2/0/1.0
172.16.1.0/32    iddn  0 172.16.1.0       recv   606    1 ge-2/0/1.0
172.16.1.1/32    user  0                rjct   46    4
172.16.1.1/32    intf  0 172.16.1.1       locl   607    2
172.16.1.1/32    iddn  0 172.16.1.1       locl   607    2
172.16.1.255/32  iddn  0 ff:ff:ff:ff:ff:ff bcst   605    1 ge-2/0/1.0
10.0.0.0/24      intf  0                rslv   616    1 ge-2/0/0.0
10.0.0.0/32      dest  0 10.0.0.0         recv   614    1 ge-2/0/0.0
10.0.0.1/32      intf  0 10.0.0.1         locl   615    2
10.0.0.1/32      dest  0 10.0.0.1         locl   615    2
10.0.0.255/32    dest  0 10.0.0.255       bcst   613    1 ge-2/0/0.0
10.1.1.0/24      ifdn  0                rslv   612    1 ge-2/0/1.0
10.1.1.0/32      iddn  0 10.1.1.0         recv   610    1 ge-2/0/1.0
10.1.1.1/32      user  0                rjct   46    4
10.1.1.1/32      intf  0 10.1.1.1         locl   611    2
10.1.1.1/32      iddn  0 10.1.1.1         locl   611    2
10.1.1.255/32    iddn  0 ff:ff:ff:ff:ff:ff bcst   609    1 ge-2/0/1.0
10.209.0.0/16    user  0 10.209.63.254    ucst   419    20 fxp0.0
10.209.0.0/16    user  1 0:12:1e:ca:98:0  ucst   419    20 fxp0.0
10.209.0.0/18    intf  0                rslv   418    1 fxp0.0
10.209.0.0/32    dest  0 10.209.0.0       recv   416    1 fxp0.0
10.209.2.131/32  intf  0 10.209.2.131     locl   417    2
10.209.2.131/32  dest  0 10.209.2.131     locl   417    2
10.209.17.55/32  dest  0 0:30:48:5b:78:d2 ucst   435    1 fxp0.0
10.209.63.42/32  dest  0 0:23:7d:58:92:ca ucst   434    1 fxp0.0
10.209.63.254/32 dest  0 0:12:1e:ca:98:0  ucst   419    20 fxp0.0
10.209.63.255/32 dest  0 10.209.63.255    bcst   415    1 fxp0.0
10.227.0.0/16    user  0 10.209.63.254    ucst   419    20 fxp0.0

...

Routing table: iso
ISO:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0                rjct   27    1
47.0005.80ff.f800.0000.0108.0003.0102.5524.5220.00
intf  0                locl   28    1

Routing table: inet6
Internet6:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm  0                rjct   6    1
ff00::/8         perm  0                mdsc   4    1
ff02::1/128      perm  0 ff02::1          mcst   3    1

Routing table: ccc
MPLS:
Interface.Label   Type RtRef Next hop          Type Index NhRef Netif
default          perm  0                rjct  16    1
100004(top)fe-0/0/1.0

```

show route forwarding-table detail

```

user@host> show route forwarding-table detail
Routing table: inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          user   2 0:90:69:8e:b1:1b ucst  132   4 fxp0.0
default          perm   0                               rjct   14    1
10.1.1.0/24      intf   0 ff.3.0.21         ucst  322   1 so-5/3/0.0
10.1.1.0/32      dest   0 10.1.1.0          recv  324   1 so-5/3/0.0
10.1.1.1/32      intf   0 10.1.1.1          locl  321   1
10.1.1.255/32    dest   0 10.1.1.255        bcst  323   1 so-5/3/0.0
10.21.21.0/24    intf   0 ff.3.0.21         ucst  326   1 so-5/3/0.0
10.21.21.0/32    dest   0 10.21.21.0        recv  328   1 so-5/3/0.0
10.21.21.1/32    intf   0 10.21.21.1        locl  325   1
10.21.21.255/32  dest   0 10.21.21.255      bcst  327   1 so-5/3/0.0
127.0.0.1/32     intf   0 127.0.0.1         locl  320   1
172.17.28.19/32  clon   1 192.168.4.254     ucst  132   4 fxp0.0
172.17.28.44/32  clon   1 192.168.4.254     ucst  132   4 fxp0.0

...

Routing table: private1__inet
Internet:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   46    1
10.0.0.0/8       intf   0                               rslv  136   1 fxp1.0
10.0.0.0/32      dest   0 10.0.0.0          recv  134   1 fxp1.0
10.0.0.4/32      intf   0 10.0.0.4          locl  135   2
10.0.0.4/32      dest   0 10.0.0.4          locl  135   2

...

Routing table: iso
ISO:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   38    1

Routing table: inet6
Internet6:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct   22    1
ff00::/8         perm   0                               mdsc   21    1
ff02::1/128      perm   0 ff02::1          mcst   17    1

...

Routing table: mpls
MPLS:
Destination      Type RtRef Next hop          Type Index NhRef Netif
default          perm   0                               rjct  28    1

```

show route forwarding-table destination extensive (Weights and Balances)

```

user@host> show route forwarding-table destination 3.4.2.1 extensive
Routing table: inet [Index 0]
Internet:

Destination: 3.4.2.1/32
Route type: user

```

Route reference: 0	Route interface-index: 0
Flags: sent to PFE	
Next-hop type: unicast	Index: 262143 Reference: 1
Nexthop: 172.16.4.4	
Next-hop type: unicast	Index: 335 Reference: 2
Next-hop interface: so-1/1/0.0	Weight: 22 Balance: 3
Nexthop: 145.12.1.2	
Next-hop type: unicast	Index: 337 Reference: 2
Next-hop interface: so-0/1/2.0	Weight: 33 Balance: 33

show route forwarding-table extensive

```

user@host> show route forwarding-table extensive
Routing table: inet [Index 0]
Internet:

Destination: default
  Route type: user
  Route reference: 2
  Flags: sent to PFE
  Nexthop: 00:00:5E:00:53:1b
  Next-hop type: unicast
  Next-hop interface: fxp0.0
  Route interface-index: 0
  Index: 132    Reference: 4

Destination: default
  Route type: permanent
  Route reference: 0
  Flags: none
  Next-hop type: reject
  Route interface-index: 0
  Index: 14    Reference: 1

Destination: 127.0.0.1/32
  Route type: interface
  Route reference: 0
  Flags: sent to PFE
  Nexthop: 127.0.0.1
  Next-hop type: local
  Route interface-index: 0
  Index: 320    Reference: 1

...

Routing table: private1__inet [Index 1]
Internet:

Destination: default
  Route type: permanent
  Route reference: 0
  Flags: sent to PFE
  Next-hop type: reject
  Route interface-index: 0
  Index: 46    Reference: 1

Destination: 10.0.0.0/8
  Route type: interface
  Route reference: 0
  Flags: sent to PFE
  Next-hop type: resolve
  Next-hop interface: fxp1.0
  Route interface-index: 3
  Index: 136    Reference: 1

...

Routing table: iso [Index 0]
ISO:

Destination: default

```

```

Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 38      Reference: 1

Routing table: inet6 [Index 0]
Internet6:

Destination: default
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 22      Reference: 1

Destination: ff00::/8
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: multicast discard
Route interface-index: 0
Index: 21      Reference: 1

...

Routing table: private1__inet6 [Index 1]
Internet6:

Destination: default
Route type: permanent
Route reference: 0
Flags: sent to PFE
Next-hop type: reject
Route interface-index: 0
Index: 54      Reference: 1

Destination: fe80::2a0:a5ff:fe3d:375/128
Route type: interface
Route reference: 0
Flags: sent to PFE
Next-hop: fe80::2a0:a5ff:fe3d:375
Next-hop type: local
Route interface-index: 0
Index: 75      Reference: 1

...

```

show route forwarding-table extensive (RPF)

The next example is based on the following configuration, which enables an RPF check on all routes that are learned from this interface, including the interface route:

```

so-1/1/0 {
  unit 0 {
    family inet {
      rpf-check;
      address 192.0.2.2/30;
    }
  }
}

user@host> show route forwarding-table extensive
Routing table: inet [Index 0]
Internet:
...
...
Destination: 192.0.2.3/32

```

```
Route type: destination
Route reference: 0
Flags: sent to PFE
Nexthop: 192.0.2.3
Next-hop type: broadcast
Next-hop interface: so-1/1/0.0
RPF interface: so-1/1/0.0

Route interface-index: 67
Index: 328      Reference: 1
```

show route forwarding-table (dynamic list next hop)

The **show route forwarding table** output shows the two next hop elements for a multihomed EVPN destination.

```
user@host> show route forwarding-table label 299952 extensive
MPLS:

Destination: 299952
Route type: user
Route reference: 0
Multicast RPF nh index: 0
P2mpidx: 0
Flags: sent to PFE, rt nh decoupled
Next-hop type: indirect
Nexthop:
Next-hop type: composite
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301632, Push 299776(top)
Load Balance Label: None
Next-hop interface: ge-0/0/1.0
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301344, Push 299792(top)
Load Balance Label: None
Next-hop interface: ge-0/0/1.0

Route interface-index: 0
Index: 1048575 Reference: 2
Index: 601      Reference: 2
Index: 1048574 Reference: 3
Index: 600 Reference: 2
Index: 1048577 Reference: 3
Index: 619 Reference: 2
```

After one of the PE router has been disabled in the EVPN multihomed network, the same **show route forwarding table** output command shows one next hop element and one empty next hop element.

```
user@host> show route forwarding-table label 299952 extensive
Routing table: default.mpls [Index 0]
MPLS:

Destination: 299952
Route type: user
Route reference: 0
Multicast RPF nh index: 0
P2mpidx: 0
Flags: sent to PFE, rt nh decoupled
Next-hop type: indirect
Nexthop:
Next-hop type: composite
Next-hop type: indirect
Nexthop: 1.0.0.4
Next-hop type: Push 301344, Push 299792(top)
Load Balance Label: None
Next-hop interface: ge-0/0/1.0

Route interface-index: 0
Index: 1048575 Reference: 2
Index: 601      Reference: 2
Index: 1048577 Reference: 3
Index: 619 Reference: 2
```

show route forwarding-table family mpls

```

user@host> show route forwarding-table family mpls
Routing table: mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm  0              rjct   19    1
0                user  0              recv   18    3
1                user  0              recv   18    3
2                user  0              recv   18    3
100000           user  0 10.31.1.6      swap  100001 fe-1/1/0.0
800002           user  0              Pop                                vt-0/3/0.32770

vt-0/3/0.32770 (VPLS)
                  user  0              indr   351    4
                  Push 800000, Push 100002(top)

so-0/0/0.0

```

show route forwarding-table family mpls ccc ge-0/0/1.1004

```

user@host> show route forwarding-table mpls ccc ge-0/0/1.1004
Routing table: default.mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
ge-0/0/1.1004    (CCC) user  0              ulst   1048577 2
                  comp      754      3
                  comp      755      3
                  comp      756      3

Routing table: __mpls-oam__.mpls
MPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm  0              dscd   556    1

```

show route forwarding-table family vpls

```

user@host> show route forwarding-table family vpls
Routing table: green.vpls
VPLS:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          dnm  0              flood  353    1
default          perm  0              rjct   298    1
fe-0/1/0.0       dnm  0              flood  355    1
00:00:5E:00:53:1f/48 <<<<<Remote CE
                  dnm  0              indr   351    4
                  Push 800000, Push 100002(top)

so-0/0/0.0
00:00:5E:00:53:1f/48 <<<<<Local CE
                  dnm  0              ucst   354    2 fe-0/1/0.0

```

show route forwarding-table vpls (Broadcast, unknown unicast, and multicast (BUM) hashing is enabled)

```

user@host> show route forwarding-table vpls
Routing table: green.vpls
VPLS:
Enabled protocols: BUM hashing
Destination      Type RtRef Next hop      Type Index NhRef Netif

```

```

default          perm    0          dscd      519      1
lsi.1048832      intf    0          indr  1048574    4
                                   172.16.3.2    Push 262145    621      2

ge-3/0/0.0
00:00:5E:00:53:01/48 user    0          ucst      590      5 ge-2/3/9.0
0x30003/51      user    0          comp      627      2
ge-2/3/9.0      intf    0          ucst      590      5 ge-2/3/9.0
ge-3/1/3.0      intf    0          ucst      619      4 ge-3/1/3.0
0x30002/51      user    0          comp      600      2
0x30001/51      user    0          comp      597      2

```

show route forwarding-table vpls (Broadcast, unknown unicast, and multicast (BUM) hashing is enabled with MAC Statistics)

```

user@host> show route forwarding-table vpls
Routing table: green.vpls
VPLS:
Enabled protocols: BUM hashing, MAC Stats
Destination      Type RtRef Next hop      Type Index  NhRef Netif
default          perm    0          dscd      519      1
lsi.1048834      intf    0          indr  1048574    4
                                   172.16.3.2    Push 262145    592      2

ge-3/0/0.0
00:19:e2:25:d0:01/48 user    0          ucst      590      5 ge-2/3/9.0
0x30003/51      user    0          comp      630      2
ge-2/3/9.0      intf    0          ucst      590      5 ge-2/3/9.0
ge-3/1/3.0      intf    0          ucst      591      4 ge-3/1/3.0
0x30002/51      user    0          comp      627      2
0x30001/51      user    0          comp      624      2

```

show route forwarding-table family vpls extensive

```

user@host> show route forwarding-table family vpls extensive
Routing table: green.vpls [Index 2]
VPLS:

Destination: default
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: unicast
Next-hop interface: fe-0/1/3.0
Next-hop type: unicast
Next-hop interface: fe-0/1/2.0
Route interface-index: 72
Index: 289      Reference: 1
Index: 291      Reference: 3
Index: 290      Reference: 3

Destination: default
Route type: permanent
Route reference: 0
Flags: none
Next-hop type: discard
Route interface-index: 0
Index: 341      Reference: 1

Destination: fe-0/1/2.0
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: indirect
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Route interface-index: 69
Index: 293      Reference: 1
Index: 363      Reference: 4

```



```

Next-hop type: indirect          Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast          Index: 291      Reference: 3
Next-hop interface: fe-0/1/3.0

Destination: fe-0/1/3.0
Route type: dynamic
Route reference: 0              Route interface-index: 70
Flags: sent to PFE
Next-hop type: flood           Index: 292      Reference: 1
Next-hop type: indirect        Index: 363      Reference: 4
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Next-hop type: indirect        Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast          Index: 290      Reference: 3
Next-hop interface: fe-0/1/2.0

Destination: 00:00:5E:00:53:01/48
Route type: dynamic
Route reference: 0              Route interface-index: 70
Flags: sent to PFE, prefix load balance
Next-hop type: unicast          Index: 291      Reference: 3
Next-hop interface: fe-0/1/3.0
Route used as destination:
  Packet count:      6640    Byte count:      675786
Route used as source
  Packet count:      6894    Byte count:      696424

Destination: 00:00:5E:00:53:04/48
Route type: dynamic
Route reference: 0              Route interface-index: 69
Flags: sent to PFE, prefix load balance
Next-hop type: unicast          Index: 290      Reference: 3
Next-hop interface: fe-0/1/2.0
Route used as destination:
  Packet count:      96      Byte count:      8079
Route used as source:
  Packet count:      296      Byte count:      24955

Destination: 00:00:5E:00:53:05/48
Route type: dynamic
Route reference: 0              Route interface-index: 74
Flags: sent to PFE, prefix load balance
Next-hop type: indirect        Index: 301      Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0

```

show route forwarding-table table default

```

user@host> show route forwarding-table table default
Routing table: default.inet
Internet:
Destination      Type RtRef Next hop      Type Index NhRef Netif
default          perm   0
0.0.0.0/32       perm   0                dscd   34    1

```

```

10.0.60.0/30      user    0 10.0.60.13      ucst   713    5 fe-0/1/3.0
10.0.60.12/30     intf    0                rslv   688    1 fe-0/1/3.0
10.0.60.12/32     dest    0 10.0.60.12      recv   686    1 fe-0/1/3.0
10.0.60.13/32     dest    0 0:5:85:8b:bc:22 ucst   713    5 fe-0/1/3.0
10.0.60.14/32     intf    0 10.0.60.14      locl   687    2
10.0.60.14/32     dest    0 10.0.60.14      locl   687    2
10.0.60.15/32     dest    0 10.0.60.15      bcst   685    1 fe-0/1/3.0
10.0.67.12/30     user    0 10.0.60.13      ucst   713    5 fe-0/1/3.0
10.0.80.0/30      ifdn    0 ff.3.0.21        ucst   676    1 so-0/0/1.0
10.0.80.0/32      dest    0 10.0.80.0        recv   678    1 so-0/0/1.0
10.0.80.2/32      user    0                rjct   36     2
10.0.80.2/32      intf    0 10.0.80.2        locl   675    1
10.0.80.3/32      dest    0 10.0.80.3        bcst   677    1 so-0/0/1.0
10.0.90.12/30     intf    0                rslv   684    1 fe-0/1/0.0
10.0.90.12/32     dest    0 10.0.90.12      recv   682    1 fe-0/1/0.0
10.0.90.14/32     intf    0 10.0.90.14      locl   683    2
10.0.90.14/32     dest    0 10.0.90.14      locl   683    2
10.0.90.15/32     dest    0 10.0.90.15      bcst   681    1 fe-0/1/0.0
10.5.0.0/16       user    0 192.168.187.126 ucst   324    15 fxp0.0
10.10.0.0/16      user    0 192.168.187.126 ucst   324    15 fxp0.0
10.13.10.0/23     user    0 192.168.187.126 ucst   324    15 fxp0.0
10.84.0.0/16      user    0 192.168.187.126 ucst   324    15 fxp0.0
10.150.0.0/16     user    0 192.168.187.126 ucst   324    15 fxp0.0
10.157.64.0/19    user    0 192.168.187.126 ucst   324    15 fxp0.0
10.209.0.0/16     user    0 192.168.187.126 ucst   324    15 fxp0.0

```

...

Routing table: default.iso

ISO:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	60	1	

Routing table: default.inet6

Internet6:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	44	1	
::/128	perm	0		dscd	42	1	
ff00::/8	perm	0		mdsc	43	1	
ff02::1/128	perm	0	ff02::1	mcst	39	1	

Routing table: default.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		dscd	50	1	

show route forwarding-table table logical-system-name/routing-instance-name

```
user@host> show route forwarding-table table R4/vpn-red
```

Logical system: R4

Routing table: vpn-red.inet

Internet:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	563	1	
0.0.0.0/32	perm	0		dscd	561	2	
172.16.0.1/32	user	0		dscd	561	2	
172.16.2.0/24	intf	0		rslv	771	1	ge-1/2/0.3
172.16.2.0/32	dest	0	172.16.2.0	recv	769	1	ge-1/2/0.3
172.16.2.1/32	intf	0	172.16.2.1	locl	770	2	
172.16.2.1/32	dest	0	172.16.2.1	locl	770	2	
172.16.2.2/32	dest	0	0.4.80.3.0.1b.c0.d5.e4.bd.0.1b.c0.d5.e4.bc.8.0				

```

172.16.2.255/32    dest    0 172.16.2.255    ucst    789    1 ge-1/2/0.3
172.16.233.0/4     perm    1                bcst    768    1 ge-1/2/0.3
172.16.233.1/32    perm    0 172.16.233.1    mdsc    562    1
255.255.255.255/32 perm    0                mcst    558    1
                                bcst    559    1

```

Logical system: R4

Routing table: vpn-red.iso

ISO:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	608	1	

Logical system: R4

Routing table: vpn-red.inet6

Internet6:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		rjct	708	1	
::/128	perm	0		dscd	706	1	
ff00::/8	perm	0		mdsc	707	1	
ff02::1/128	perm	0	ff02::1	mcst	704	1	

Logical system: R4

Routing table: vpn-red.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0		dscd	638		

show route forwarding-table vpn

```
user@host> show route forwarding-table vpn VPN-A
```

Routing table:: VPN-A.inet

Internet:

Destination	Type	RtRef	Nexthop	Type	Index	NhRef	Netif
default	perm	0		rjct	4	4	
10.39.10.20/30	intf	0	ff.3.0.21	ucst	40	1	
so-0/0/0.0							
10.39.10.21/32	intf	0	10.39.10.21	loc1	36	1	
10.255.14.172/32	user	0		ucst	69	2	
so-0/0/0.0							
10.255.14.175/32	user	0		indr	81	3	
				Push	100004	Push	
100004(top) so-1/0/0.0							
172.16.233.0/4	perm	2		mdsc	5	3	
172.16.233.1/32	perm	0	172.16.233.1	mcst	1	8	
172.16.233.5/32	user	1	172.16.233.5	mcst	1	8	
255.255.255.255/32	perm	0		bcst	2	3	

On QFX5200, the results for this command look like this:

```
show route forwarding-table family mpls
```

Routing table: default.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0	dscd	65	1		
0	user	0	recv	64	4		
1	user	0	recv	64	4		
2	user	0	recv	64	4		
13	user	0	recv	64	4		
300384	user	0	9.1.1.1 Pop	1711	2	xe-0/0/34.0	
300384(S=0)	user	0	9.1.1.1 Pop	1712	2	xe-0/0/34.0	

```
300400 user 0 ulst 131071 2
                                10.1.1.2 Pop 1713 1 xe-0/0/38.0
                                172.16.11.2 Pop 1714 1 xe-0/0/40.0
300400(S=0) user 0 ulst 131072 2
                                10.1.1.2 Pop 1715 1 xe-0/0/38.0
                                172.16.11.2 Pop 1716 1 xe-0/0/40.0
```

Routing table: __mpls-oam__.mpls

MPLS:

Destination	Type	RtRef	Next hop	Type	Index	NhRef	Netif
default	perm	0	dscd	1681	1		

show route hidden

Syntax	show route hidden <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display only hidden route information. A hidden route is unusable, even if it is the best path.
Options	brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Understanding Hidden Routes</i>
List of Sample Output	show route hidden on page 593 show route hidden detail on page 594 show route hidden extensive on page 594 show route hidden terse on page 594
Output Fields	For information about output fields, see the output field table for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route hidden

```

user@host> show route hidden
inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
127.0.0.1/32      [Direct/0] 04:26:38
                  > via lo0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
10.5.5.5/32      [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: 100 I

```

```

10.12.1.0/24      Unusable
                  [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: 100 I
10.12.80.4/30    Unusable
                  [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
                  AS path: I
...              Unusable

```

show route hidden detail

```

user@host> show route hidden detail

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
127.0.0.1/32 (1 entry, 0 announced)
  Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 1
    Next hop: via lo0.0, selected
    State: <Hidden Martian Int>
    Local AS:      1
    Age: 4:27:37
    Task: IF
    AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete

10.5.5.5/32 (1 entry, 0 announced)
  BGP   Preference: 170/-101
    Route Distinguisher: 10.4.4.4:4
    Next hop type: Unusable
    Next-hop reference count: 6
    State: <Secondary Hidden Int Ext>
    Local AS:      1 Peer AS:      1
    Age: 3:45:09
    Task: BGP_1.10.4.4.4+2493
    AS path: 100 I
    Communities: target:1:999
    VPN Label: 100064
    Localpref: 100
    Router ID: 10.4.4.4
    Primary Routing Table bgp.13vpn.0
...

```

show route hidden extensive

The output for the **show route hidden extensive** command is identical to that of the **show route hidden detail** command. For sample output, see [show route hidden detail on page 375](#).

show route hidden terse

```
user@host> show route hidden terse
```

```

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
127.0.0.1/32      D   0
private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
10.5.5.5/32       B 170      100          Unusable     100 I
10.12.1.0/24      B 170      100          Unusable     100 I
10.12.80.4/30     B 170      100          Unusable     I

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

bgp.l3vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
10.4.4.4:4:10.5.5.5/32
                  B 170      100          Unusable     100 I
10.4.4.4:4:10.12.1.0/24
                  B 170      100          Unusable     100 I
10.4.4.4:4:10.12.80.4/30
                  B 170      100          Unusable     I

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route inactive-path

List of Syntax	Syntax on page 596 Syntax (EX Series Switches) on page 596
Syntax	<code>show route inactive-path</code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route inactive-path</code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display routes for destinations that have no active route. An inactive route is a route that was not selected as the best path.
Options	none —Display all inactive routes. brief detail extensive terse —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief . logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show route active-path on page 295
List of Sample Output	show route inactive-path on page 596 show route inactive-path detail on page 597 show route inactive-path extensive on page 598 show route inactive-path terse on page 598
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route inactive-path

```
user@host> show route inactive-path

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
```



```

Restart Complete
+ = Active Route, - = Last Active, * = Both

10.12.100.12/30      [OSPF/10] 03:57:28, metric 1
                    > via so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.0/8          [Direct/0] 04:39:56
                    > via fxp1.0

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

10.12.80.0/30       [BGP/170] 04:38:17, localpref 100
                    AS path: 100 I
                    > to 10.12.80.1 via ge-6/3/2.0

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

bgp.l3vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route inactive-path detail

```

user@host> show route inactive-path detail

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete

10.12.100.12/30 (2 entries, 1 announced)
  OSPF   Preference: 10
        Next-hop reference count: 1
        Next hop: via so-0/3/0.0, selected
        State: <Int>
        Inactive reason: Route Preference
        Local AS:      1
        Age: 3:58:24   Metric: 1
        Area: 0.0.0.0
        Task: OSPF
        AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

10.0.0.0/8 (2 entries, 0 announced)
  Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via fxp1.0, selected
        State: <NotBest Int>

```

```

Inactive reason: No difference
Age: 4:40:52
Task: IF
AS path: I

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete

10.12.80.0/30 (2 entries, 1 announced)
  BGP Preference: 170/-101
    Next-hop reference count: 6
    Source: 10.12.80.1
    Next hop: 10.12.80.1 via ge-6/3/2.0, selected
    State: <Ext>
    Inactive reason: Route Preference
    Peer AS: 100
    Age: 4:39:13
    Task: BGP_100.10.12.80.1+179
    AS path: 100 I
    Localpref: 100
    Router ID: 10.0.0.0

```

show route inactive-path extensive

The output for the **show route inactive-path extensive** command is identical to that of the **show route inactive-path detail** command. For sample output, see [show route inactive-path detail on page 378](#).

show route inactive-path terse

```

user@host> show route inactive-path terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
10.12.100.12/30    0 10           1           >so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
10.0.0.0/8         D  0           0           >fxp1.0

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
10.12.80.0/30      B 170          100          >10.12.80.1    100 I

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

```

bgp.l3vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

show route instance

List of Syntax	Syntax on page 600 Syntax (EX Series Switches and QFX Series) on page 600
Syntax	<pre>show route instance <brief detail summary> <instance-name> <logical-system (all logical-system-name)> <operational></pre>
Syntax (EX Series Switches and QFX Series)	<pre>show route instance <brief detail summary> <instance-name> <operational></pre>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.3 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display routing instance information.
Options	<p>none—(Same as brief) Display standard information about all routing instances.</p> <p>brief detail summary—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief. (These options are not available with the operational keyword.)</p> <p>instance-name—(Optional) Display information for all routing instances whose name begins with this string (for example, cust1, cust11, and cust111 are all displayed when you run the show route instance cust1 command).</p> <p>logical-system (all logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>operational—(Optional) Display operational routing instances.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• <i>Example: Transporting IPv6 Traffic Across IPv4 Using Filter-Based Tunneling</i>• <i>Example: Configuring the Helper Capability Mode for OSPFv3 Graceful Restart</i>
List of Sample Output	show route instance on page 602 show route instance detail (Graceful Restart Complete) on page 602 show route instance detail (Graceful Restart Incomplete) on page 604

[show route instance detail \(VPLS Routing Instance\) on page 606](#)

[show route instance operational on page 606](#)

[show route instance summary on page 606](#)

Output Fields Table 26 on page 382 lists the output fields for the **show route instance** command. Output fields are listed in the approximate order in which they appear.

Table 47: show route instance Output Fields

Field Name	Field Description	Level of Output
Instance or <i>instance-name</i>	Name of the routing instance.	All levels
Operational Routing Instances	(operational keyword only) Names of all operational routing instances.	—
Type	Type of routing instance: forwarding , l2vpn , no-forwarding , vpls , virtual-router , or vrf .	All levels
State	State of the routing instance: active or inactive .	brief detail none
Interfaces	Name of interfaces belonging to this routing instance.	brief detail none
Restart State	Status of graceful restart for this instance: Pending or Complete .	detail
Path selection timeout	Maximum amount of time, in seconds, remaining until graceful restart is declared complete. The default is 300 .	detail
Tables	Tables (and number of routes) associated with this routing instance.	brief detail none
Route-distinguisher	Unique route distinguisher associated with this routing instance.	detail
Vrf-import	VPN routing and forwarding instance import policy name.	detail
Vrf-export	VPN routing and forwarding instance export policy name.	detail
Vrf-import-target	VPN routing and forwarding instance import target community name.	detail
Vrf-export-target	VPN routing and forwarding instance export target community name.	detail
Vrf-edge-protection-id	Context identifier configured for edge-protection.	detail
Fast-reroute-priority	Fast reroute priority setting for a VPLS routing instance: high , medium , or low . The default is low .	detail
Restart State	Restart state: <ul style="list-style-type: none"> Pending:protocol-name—List of protocols that have not yet completed graceful restart for this routing table. Complete—All protocols have restarted for this routing table. 	detail

Table 47: show route instance Output Fields (*continued*)

Field Name	Field Description	Level of Output
Primary rib	Primary table for this routing instance.	brief none summary
Active/holddown/hidden	Number of active, hold-down, and hidden routes.	All levels

Sample Output

show route instance

```

user@host> show route instance
Instance          Type
Primary RIB
master            forwarding
inet.0            16/0/1
iso.0             1/0/0
mpls.0            0/0/0
inet6.0           2/0/0
l2circuit.0       0/0/0
__juniper_private1__ forwarding
__juniper_private1__.inet.0 12/0/0
__juniper_private1__.inet6.0 1/0/0

```

show route instance detail (Graceful Restart Complete)

```

user@host> show route instance detail
master:
Router ID: 10.255.14.176
Type: forwarding      State: Active
Restart State: Complete Path selection timeout: 300
Tables:
inet.0                : 17 routes (15 active, 0 holddown, 1 hidden)
Restart Complete
inet.3                : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
iso.0                 : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete
mpls.0               : 19 routes (19 active, 0 holddown, 0 hidden)
Restart Complete
bgp.l3vpn.0          : 10 routes (10 active, 0 holddown, 0 hidden)
Restart Complete
inet6.0              : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
bgp.l2vpn.0          : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete
BGP-INET:
Router ID: 10.69.103.1
Type: vrf             State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
t3-0/0/0.103
Route-distinguisher: 10.255.14.176:103
Vrf-import: [ BGP-INET-import ]
Vrf-export: [ BGP-INET-export ]
Tables:
BGP-INET.inet.0       : 4 routes (4 active, 0 holddown, 0 hidden)

```

```

Restart Complete
BGP-L:
Router ID: 10.69.104.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.104
Route-distinguisher: 10.255.14.176:104
Vrf-import: [ BGP-L-import ]
Vrf-export: [ BGP-L-export ]
Tables:
  BGP-L.inet.0                  : 4 routes (4 active, 0 holddown, 0 hidden)
  Restart Complete
  BGP-L.mpls.0                  : 3 routes (3 active, 0 holddown, 0 hidden)
  Restart Complete
L2VPN:
Router ID: 0.0.0.0
Type: l2vpn                    State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.512
Route-distinguisher: 10.255.14.176:512
Vrf-import: [ L2VPN-import ]
Vrf-export: [ L2VPN-export ]
Tables:
  L2VPN.l2vpn.0                 : 2 routes (2 active, 0 holddown, 0 hidden)
  Restart Complete
LDP:
Router ID: 10.69.105.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.105
Route-distinguisher: 10.255.14.176:105
Vrf-import: [ LDP-import ]
Vrf-export: [ LDP-export ]
Tables:
  LDP.inet.0                    : 5 routes (4 active, 0 holddown, 0 hidden)
  Restart Complete
OSPF:
Router ID: 10.69.101.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.101
Route-distinguisher: 10.255.14.176:101
Vrf-import: [ OSPF-import ]
Vrf-export: [ OSPF-export ]
Vrf-import-target: [ target:11111
Tables:
  OSPF.inet.0                   : 8 routes (7 active, 0 holddown, 0 hidden)
  Restart Complete
RIP:
Router ID: 10.69.102.1
Type: vrf                      State: Active
Restart State: Complete Path selection timeout: 300
Interfaces:
  t3-0/0/0.102
Route-distinguisher: 10.255.14.176:102
Vrf-import: [ RIP-import ]
Vrf-export: [ RIP-export ]

```

```

Tables:
  RIP.inet.0          : 6 routes (6 active, 0 holddown, 0 hidden)
  Restart Complete
STATIC:
  Router ID: 10.69.100.1
  Type: vrf           State: Active
  Restart State: Complete Path selection timeout: 300
  Interfaces:
    t3-0/0/0.100
  Route-distinguisher: 10.255.14.176:100
  Vrf-import: [ STATIC-import ]
  Vrf-export: [ STATIC-export ]
  Tables:
    STATIC.inet.0      : 4 routes (4 active, 0 holddown, 0 hidden)
    Restart Complete

```

show route instance detail (Graceful Restart Incomplete)

```

user@host> show route instance detail
master:
  Router ID: 10.255.14.176
  Type: forwarding      State: Active
  Restart State: Pending Path selection timeout: 300
  Tables:
    inet.0              : 17 routes (15 active, 1 holddown, 1 hidden)
    Restart Pending: OSPF LDP
    inet.3              : 2 routes (2 active, 0 holddown, 0 hidden)
    Restart Pending: OSPF LDP
    iso.0               : 1 routes (1 active, 0 holddown, 0 hidden)
    Restart Complete
    mpls.0              : 23 routes (23 active, 0 holddown, 0 hidden)
    Restart Pending: LDP VPN
    bgp.l3vpn.0         : 10 routes (10 active, 0 holddown, 0 hidden)
    Restart Pending: BGP VPN
    inet6.0             : 2 routes (2 active, 0 holddown, 0 hidden)
    Restart Complete
    bgp.l2vpn.0         : 1 routes (1 active, 0 holddown, 0 hidden)
    Restart Pending: BGP VPN
  BGP-INET:
    Router ID: 10.69.103.1
    Type: vrf           State: Active
    Restart State: Pending Path selection timeout: 300
    Interfaces:
      t3-0/0/0.103
    Route-distinguisher: 10.255.14.176:103
    Vrf-import: [ BGP-INET-import ]
    Vrf-export: [ BGP-INET-export ]
    Tables:
      BGP-INET.inet.0    : 6 routes (5 active, 0 holddown, 0 hidden)
      Restart Pending: VPN
  BGP-L:
    Router ID: 10.69.104.1
    Type: vrf           State: Active
    Restart State: Pending Path selection timeout: 300
    Interfaces:
      t3-0/0/0.104
    Route-distinguisher: 10.255.14.176:104
    Vrf-import: [ BGP-L-import ]
    Vrf-export: [ BGP-L-export ]
    Tables:
      BGP-L.inet.0       : 6 routes (5 active, 0 holddown, 0 hidden)

```



```

Restart Pending: VPN
BGP-L.mpls.0      : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Pending: VPN
L2VPN:
Router ID: 0.0.0.0
Type: l2vpn        State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.512
Route-distinguisher: 10.255.14.176:512
Vrf-import: [ L2VPN-import ]
Vrf-export: [ L2VPN-export ]
Tables:
  L2VPN.l2vpn.0      : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Pending: VPN L2VPN
LDP:
Router ID: 10.69.105.1
Type: vrf          State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.105
Route-distinguisher: 10.255.14.176:105
Vrf-import: [ LDP-import ]
Vrf-export: [ LDP-export ]
Tables:
  LDP.inet.0         : 5 routes (4 active, 1 holddown, 0 hidden)
Restart Pending: OSPF LDP VPN
OSPF:
Router ID: 10.69.101.1
Type: vrf          State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.101
Route-distinguisher: 10.255.14.176:101
Vrf-import: [ OSPF-import ]
Vrf-export: [ OSPF-export ]
Tables:
  OSPF.inet.0        : 8 routes (7 active, 1 holddown, 0 hidden)
Restart Pending: OSPF VPN
RIP:
Router ID: 10.69.102.1
Type: vrf          State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.102
Route-distinguisher: 10.255.14.176:102
Vrf-import: [ RIP-import ]
Vrf-export: [ RIP-export ]
Tables:
  RIP.inet.0         : 8 routes (6 active, 2 holddown, 0 hidden)
Restart Pending: RIP VPN
STATIC:
Router ID: 10.69.100.1
Type: vrf          State: Active
Restart State: Pending Path selection timeout: 300
Interfaces:
  t3-0/0/0.100
Route-distinguisher: 10.255.14.176:100
Vrf-import: [ STATIC-import ]
Vrf-export: [ STATIC-export ]
Tables:

```

```

STATIC.inet.0          : 4 routes (4 active, 0 holddown, 0 hidden)
Restart Pending: VPN

```

show route instance detail (VPLS Routing Instance)

```

user@host> show route instance detail test-vpls
test-vpls:
  Router ID: 0.0.0.0
  Type: vpls          State: Active
  Interfaces:
    lsi.1048833
    lsi.1048832
    fe-0/1/0.513
  Route-distinguisher: 10.255.37.65:1
  Vrf-import: [ __vrf-import-test-vpls-internal__ ]
  Vrf-export: [ __vrf-export-test-vpls-internal__ ]
  Vrf-import-target: [ target:300:1 ]
  Vrf-export-target: [ target:300:1 ]
  Vrf-edge-protection-id: 166.1.3.1 Fast-reroute-priority: high
  Tables:
    test-vpls.l2vpn.0          : 3 routes (3 active, 0 holddown, 0 hidden)

```

show route instance operational

```

user@host> show route instance operational
Operational Routing Instances:

master
default

```

show route instance summary

```

user@host> show route instance summary

```

Instance	Type	Primary rib	Active/holddown/hidden
master	forwarding	inet.0	15/0/1
		iso.0	1/0/0
		mpls.0	35/0/0
		l3vpn.0	0/0/0
		inet6.0	2/0/0
		l2vpn.0	0/0/0
		l2circuit.0	0/0/0
BGP-INET	vrf	BGP-INET.inet.0	5/0/0
		BGP-INET.iso.0	0/0/0
		BGP-INET.inet6.0	0/0/0
BGP-L	vrf	BGP-L.inet.0	5/0/0
		BGP-L.iso.0	0/0/0
		BGP-L.mpls.0	4/0/0
		BGP-L.inet6.0	0/0/0
L2VPN	l2vpn	L2VPN.inet.0	0/0/0
		L2VPN.iso.0	0/0/0
		L2VPN.inet6.0	0/0/0
		L2VPN.l2vpn.0	2/0/0
LDP	vrf	LDP.inet.0	4/0/0
		LDP.iso.0	0/0/0
		LDP.mpls.0	0/0/0

OSPF	vrf	LDP.inet6.0	0/0/0
		LDP.l2circuit.0	0/0/0
RIP	vrf	OSPF.inet.0	7/0/0
		OSPF.iso.0	0/0/0
		OSPF.inet6.0	0/0/0
		RIP.inet.0	6/0/0
STATIC	vrf	RIP.iso.0	0/0/0
		RIP.inet6.0	0/0/0
		STATIC.inet.0	4/0/0
		STATIC.iso.0	0/0/0
		STATIC.inet6.0	0/0/0

show route next-hop

List of Syntax	Syntax on page 608 Syntax (EX Series Switches) on page 608
Syntax	<code>show route next-hop <i>next-hop</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route next-hop <i>next-hop</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the entries in the routing table that are being sent to the specified next-hop address.
Options	brief detail extensive terse —(Optional) Display the specified level of output. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>next-hop</i> —Next-hop address.
Required Privilege Level	view
List of Sample Output	show route next-hop on page 608 show route next-hop detail on page 609 show route next-hop extensive on page 611 show route next-hop terse on page 612
Output Fields	For information about output fields, see the output field tables for the show route command, the show route detail command, the show route extensive command, or the show route terse command.

Sample Output

show route next-hop

```
user@host> show route next-hop 192.168.71.254

inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

10.10.0.0/16      *[Static/5] 06:26:25
                  > to 192.168.71.254 via fxp0.0
10.209.0.0/16     *[Static/5] 06:26:25
```

```

> to 192.168.71.254 via fxp0.0
172.16.0.0/12    *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
192.168.0.0/16  *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
192.168.102.0/23 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
207.17.136.0/24 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0
207.17.136.192/32 *[Static/5] 06:26:25
> to 192.168.71.254 via fxp0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route next-hop detail

```

user@host> show route next-hop 192.168.71.254 detail

inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
Restart Complete
10.10.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

10.209.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

172.16.0.0/12 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>

```

```
Local AS:      1
Age: 6:27:41
Task: RT
Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
AS path: I

192.168.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

192.168.102.0/23 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

207.17.136.0/24 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

207.17.136.192/32 (1 entry, 1 announced)
  *Static Preference: 5
    Next-hop reference count: 36
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS:      1
    Age: 6:27:41
    Task: RT
    Announcement bits (3): 0-KRT 3-Resolve tree 1 5-Resolve tree 2
    AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete
```

```

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

show route next-hop extensive

```

user@host> show route next-hop 192.168.71.254 extensive

inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
10.10.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.10.0.0/16 -> {192.168.71.254}
    *Static Preference: 5
        Next-hop reference count: 22
        Next hop: 192.168.71.254 via fxp0.0, selected
        State: <Active NoReadvrt Int Ext>
        Local AS: 69
        Age: 2:02:28
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

10.209.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.209.0.0/16 -> {192.168.71.254}
    *Static Preference: 5
        Next-hop reference count: 22
        Next hop: 192.168.71.254 via fxp0.0, selected
        State: <Active NoReadvrt Int Ext>
        Local AS: 69
        Age: 2:02:28
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

172.16.0.0/12 (1 entry, 1 announced)
TSI:
KRT in-kernel 172.16.0.0/12 -> {192.168.71.254}
    *Static Preference: 5
        Next-hop reference count: 22
        Next hop: 192.168.71.254 via fxp0.0, selected
        State: <Active NoReadvrt Int Ext>
        Local AS: 69
        Age: 2:02:28
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

192.168.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 192.168.0.0/16 -> {192.168.71.254}
    *Static Preference: 5
        Next-hop reference count: 22
        Next hop: 192.168.71.254 via fxp0.0, selected
        State: <Active NoReadvrt Int Ext>
        Local AS: 69
        Age: 2:02:28
        Task: RT
        Announcement bits (1): 0-KRT
        AS path: I

```

```
192.168.102.0/23 (1 entry, 1 announced)
TSI:
KRT in-kernel 192.168.102.0/23 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

207.17.136.0/24 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.0/24 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

207.17.136.192/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.192/32 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 22
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 69
    Age: 2:02:28
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

green.l2vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

red.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route next-hop terse

```
user@host> show route next-hop 192.168.71.254 terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both
```


A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	10.10.0.0/16	S	5			>192.168.71.254	
*	10.209.0.0/16	S	5			>192.168.71.254	
*	172.16.0.0/12	S	5			>192.168.71.254	
*	192.168.0.0/16	S	5			>192.168.71.254	
*	192.168.102.0/23	S	5			>192.168.71.254	
*	207.17.136.0/24	S	5			>192.168.71.254	
*	207.17.136.192/32	S	5			>192.168.71.254	

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

show route output

List of Syntax	Syntax on page 614 Syntax (EX Series Switches) on page 614
Syntax	<code>show route output (address <i>ip-address</i> interface <i>interface-name</i>)</code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches)	<code>show route output (address <i>ip-address</i> interface <i>interface-name</i>)</code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	<p>Display the entries in the routing table learned through static routes and interior gateway protocols that are to be sent out the interface with either the specified IP address or specified name.</p> <p>To view routes advertised to a neighbor or received from a neighbor for the BGP protocol, use the show route advertising-protocol bgp and show route receive-protocol bgp commands instead.</p>
Options	<p>address <i>ip-address</i>—Display entries in the routing table that are to be sent out the interface with the specified IP address.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p>interface <i>interface-name</i>—Display entries in the routing table that are to be sent out the interface with the specified name.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p>
Required Privilege Level	view
List of Sample Output	show route output address on page 615 show route output address detail on page 615 show route output address extensive on page 616 show route output address terse on page 616 show route output interface on page 616 show route output interface detail on page 617 show route output interface extensive on page 617 show route output interface terse on page 617

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

show route output address

```
user@host> show route output address 172.16.36.1/24

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.36.0/24          *[Direct/0] 00:19:56
                        > via so-0/1/2.0
                        [OSPF/10] 00:19:55, metric 1
                        > via so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output address detail

```
user@host> show route output address 172.16.36.1 detail

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
172.16.36.0/24 (2 entries, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via so-0/1/2.0, selected
        State: <Active Int>
        Age: 23:00
        Task: IF
        AS path: I
    OSPF Preference: 10
        Next-hop reference count: 1
        Next hop: via so-0/1/2.0, selected
        State: <Int>
        Inactive reason: Route Preference
        Age: 22:59      Metric: 1
        Area: 0.0.0.0
        Task: OSPF
        AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
```

```
private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output address extensive

The output for the **show route output address extensive** command is identical to that of the **show route output address detail** command. For sample output, see [show route output address detail on page 396](#).

show route output address terse

```
user@host> show route output address 172.16.36.1 terse

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1   Metric 2   Next hop      AS path
* 172.16.36.0/24    D  0           1           >so-0/1/2.0
                      0 10           >so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output interface

```
user@host> show route output interface so-0/1/2.0

inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.71.240/32    *[OSPF/10] 00:13:00, metric 2
                    via so-0/1/2.0
                    > via so-0/3/2.0
10.255.71.241/32    *[OSPF/10] 00:13:10, metric 1
                    > via so-0/1/2.0
172.16.14.0/24      *[OSPF/10] 00:05:11, metric 3
                    to 35.1.1.2 via ge-3/1/0.0
                    > via so-0/1/2.0
                    via so-0/3/2.0
172.16.16.0/24      *[OSPF/10] 00:13:10, metric 2
                    > via so-0/1/2.0
172.16.36.0/24      *[Direct/0] 00:13:21
                    > via so-0/1/2.0
                    [OSPF/10] 00:13:20, metric 1
                    > via so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
```

```
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route output interface detail

```
user@host> show route output interface so-0/1/2.0 detail
```

```
inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
10.255.71.240/32 (1 entry, 1 announced)
    *OSPF   Preference: 10
           Next-hop reference count: 2
           Next hop: via so-0/1/2.0
           Next hop: via so-0/3/2.0, selected
           State: <Active Int>
           Age: 14:52      Metric: 2
           Area: 0.0.0.0
           Task: OSPF
           Announcement bits (1): 0-KRT
           AS path: I

10.255.71.241/32 (1 entry, 1 announced)
    *OSPF   Preference: 10
           Next-hop reference count: 4
           Next hop: via so-0/1/2.0, selected
           State: <Active Int>
           Age: 15:02      Metric: 1
           Area: 0.0.0.0
           Task: OSPF
           Announcement bits (1): 0-KRT
           AS path: I

...
```

show route output interface extensive

The output for the **show route output interface extensive** command is identical to that of the **show route output interface detail** command. For sample output, see [show route output interface detail on page 398](#).

show route output interface terse

```
user@host> show route output interface so-0/1/2.0 terse
```

```
inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* 10.255.71.240/32  0 10      2          so-0/1/2.0
                        >so-0/3/2.0
* 10.255.71.241/32  0 10      1          >so-0/1/2.0
* 172.16.14.0/24    0 10      3          35.1.1.2
                        >so-0/1/2.0
                        >so-0/3/2.0
* 172.16.16.0/24    0 10      2          >so-0/1/2.0
* 172.16.36.0/24    D 0      1          >so-0/1/2.0
                        0 10      1          >so-0/1/2.0

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
```

```
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
private1__inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
```

show route protocol

List of Syntax	Syntax on page 619 Syntax (EX Series Switches) on page 619
Syntax	<pre>show route protocol <i>protocol</i> <brief detail extensive terse> <logical-system (all <i>logical-system-name</i>)></pre>
Syntax (EX Series Switches)	<pre>show route protocol <i>protocol</i> <brief detail extensive terse></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>ospf2 and ospf3 options introduced in Junos OS Release 9.2.</p> <p>ospf2 and ospf3 options introduced in Junos OS Release 9.2 for EX Series switches.</p> <p>flow option introduced in Junos OS Release 10.0.</p> <p>flow option introduced in Junos OS Release 10.0 for EX Series switches.</p>
Description	Display the route entries in the routing table that were learned from a particular protocol.
Options	<p>brief detail extensive terse—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to brief.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><i>protocol</i>—Protocol from which the route was learned:</p> <ul style="list-style-type: none"> • access—Access route for use by DHCP application • access-internal—Access-internal route for use by DHCP application • aggregate—Locally generated aggregate route • arp—Route learned through the Address Resolution Protocol • atmvpn—Asynchronous Transfer Mode virtual private network • bgp—Border Gateway Protocol • ccc—Circuit cross-connect • direct—Directly connected route • dvmrp—Distance Vector Multicast Routing Protocol • esis—End System-to-Intermediate System • flow—Locally defined flow-specification route • frr—Precomputed protection route or backup route used when a link goes down • isis—Intermediate System-to-Intermediate System

- **ldp**—Label Distribution Protocol
- **l2circuit**—Layer 2 circuit
- **l2vpn**—Layer 2 virtual private network
- **local**—Local address
- **mpls**—Multiprotocol Label Switching
- **msdp**—Multicast Source Discovery Protocol
- **ospf**—Open Shortest Path First versions 2 and 3
- **ospf2**—Open Shortest Path First versions 2 only
- **ospf3**—Open Shortest Path First version 3 only
- **pim**—Protocol Independent Multicast
- **rip**—Routing Information Protocol
- **ripng**—Routing Information Protocol next generation
- **rsvp**—Resource Reservation Protocol
- **rtarget**—Local route target virtual private network
- **static**—Statically defined route
- **tunnel**—Dynamic tunnel
- **vpn**—Virtual private network



NOTE: EX Series switches run a subset of these protocols. See the switch CLI for details.

Required Privilege Level	view
List of Sample Output	show route protocol access on page 621 show route protocol access-internal extensive on page 621 show route protocol arp on page 621 show route protocol bgp on page 622 show route protocol bgp detail on page 622 show route protocol bgp detail (Labeled Unicast) on page 623 show route protocol bgp detail (Aggregate Extended Community Bandwidth) on page 623 show route protocol bgp extensive on page 624 show route protocol bgp terse on page 625 show route protocol direct on page 625 show route protocol frr on page 625 show route protocol l2circuit detail on page 626

[show route protocol l2vpn extensive on page 627](#)
[show route protocol ldp on page 627](#)
[show route protocol ldp extensive on page 628](#)
[show route protocol ospf \(Layer 3 VPN\) on page 629](#)
[show route protocol ospf detail on page 630](#)
[show route protocol rip on page 630](#)
[show route protocol rip detail on page 630](#)
[show route protocol ripng table inet6 on page 630](#)
[show route protocol static detail on page 631](#)

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

show route protocol access

```

user@host> show route protocol access
inet.0: 30380 destinations, 30382 routes (30379 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

13.160.0.3/32      *[Access/13] 00:00:09
                   > to 13.160.0.2 via fe-0/0/0.0
13.160.0.4/32      *[Access/13] 00:00:09
                   > to 13.160.0.2 via fe-0/0/0.0
13.160.0.5/32      *[Access/13] 00:00:09
                   > to 13.160.0.2 via fe-0/0/0.0

```

show route protocol access-internal extensive

```

user@host> show route protocol access-internal 13.160.0.19 extensive
inet.0: 100020 destinations, 100022 routes (100019 active, 0 holddown, 1 hidden)
13.160.0.19/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 13.160.0.19/32 -> {13.160.0.2}
    *Access-internal Preference: 12
      Next-hop reference count: 200000
      Next hop: 13.160.0.2 via fe-0/0/0.0, selected
      State: <Active Int>
    Age: 36
      Task: RPD Unix Domain Server./var/run/rpd_serv.local
      Announcement bits (1): 0-KRT
      AS path: I

```

show route protocol arp

```

user@host> show route protocol arp
inet.0: 43 destinations, 43 routes (42 active, 0 holddown, 1 hidden)

inet.3: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

cust1.inet.0: 1033 destinations, 2043 routes (1033 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

20.20.1.3/32      [ARP/4294967293] 00:04:35, from 20.20.1.1

```

```

Unusable
20.20.1.4/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.5/32      [ARP/4294967293] 00:04:32, from 20.20.1.1
Unusable
20.20.1.6/32      [ARP/4294967293] 00:04:34, from 20.20.1.1
Unusable
20.20.1.7/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.8/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.9/32      [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.10/32     [ARP/4294967293] 00:04:35, from 20.20.1.1
Unusable
20.20.1.11/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
20.20.1.12/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
20.20.1.13/32     [ARP/4294967293] 00:04:33, from 20.20.1.1
Unusable
...

```

show route protocol bgp

```

user@host> show route protocol bgp 192.168.64.0/21
inet.0: 335832 destinations, 335833 routes (335383 active, 0 holddown, 450 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.64.0/21      *[BGP/170] 6d 10:41:16, localpref 100, from 192.168.69.71
                     AS path: 10458 14203 2914 4788 4788 I
                     > to 192.168.167.254 via fxp0.0

```

show route protocol bgp detail

```

user@host> show route protocol bgp 66.117.63.0/24 detail
inet.0: 335805 destinations, 335806 routes (335356 active, 0 holddown, 450 hidden)
66.117.63.0/24      (1 entry, 1 announced)
    *BGP      Preference: 170/-101
                Next hop type: Indirect
                Next-hop reference count: 1006436
                Source: 192.168.69.71
                Next hop type: Router, Next hop index: 324
                Next hop: 192.168.167.254 via fxp0.0, selected
                Protocol next hop: 192.168.69.71
                Indirect next hop: 8e166c0 342
                State: <Active Ext>
                Local AS: 69 Peer AS: 10458
                Age: 6d 10:42:42 Metric2: 0
                Task: BGP_10458.192.168.69.71+179
                Announcement bits (3): 0-KRT 2-BGP RT Background 3-Resolve tree

1
    AS path: 10458 14203 2914 4788 4788 I
    Communities: 2914:410 2914:2403 2914:3400
    Accepted
    Localpref: 100
    Router ID: 207.17.136.192

```

show route protocol bgp detail (Labeled Unicast)

```

user@host> show route protocol bgp 1.1.1.8/32 detail
inet.0: 45 destinations, 46 routes (45 active, 0 holddown, 0 hidden)
1.1.1.8/32 (2 entries, 2 announced)
State:
*BGP Preference: 1/-101
Next hop type: Indirect, Next hop index: 0
Address: 0xc007f30
Next-hop reference count: 2
Source: 1.1.1.1
Next hop type: Router, Next hop index: 614
Next hop: 20.1.1.2 via ge-0/0/1.0, selected
Label-switched-path lsp1
Label operation: Push 1000126, Push 1000125, Push 1000124, Push 1000123, Push
299872(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl, prop-ttl, prop-ttl(top)
Load balance label: Label 1000126: None; Label 1000125: None; Label 1000124: None;
Label 1000123: None; Label 299872: None;
Label element ptr: 0xc007860
Label parent element ptr: 0xc0089a0
Label element references: 1
Label element child references: 0
Label element lsp id: 0
Session Id: 0x140
Protocol next hop: 1.1.1.4
Label operation: Push 1000126, Push 1000125, Push 1000124, Push 1000123(top)
Label TTL action: prop-ttl, prop-ttl, prop-ttl, prop-ttl
Load balance label: Label 1000126: None; Label 1000125: None; Label 1000124: None;
Label 1000123: None;
Indirect next hop: 0xae8d300 1048576 INH Session ID: 0x142
State:
Local AS: 5 Peer AS: 5
Age: 22:43 Metric2: 2
Validation State: unverified
Task: BGP_5.1.1.1.1
Announcement bits (2): 0-KRT 7-Resolve tree 2
AS path: I
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Localpref: 100
Router ID: 1.1.1.1

```

show route protocol bgp detail (Aggregate Extended Community Bandwidth)

```

user@host> show route 10.0.2.0 protocol bgp detail
inet.0: 20 destinations, 26 routes (20 active, 0 holddown, 0 hidden)
10.0.2.0/30 (2 entries, 1 announced)
*BGP Preference: 170/-101
Next hop type: Router, Next hop index: 0
Address: 0xb618990
Next-hop reference count: 3
Source: 10.0.1.1
Next hop: 10.0.0.2 via ge-0/0/0.0 balance 40%
Session Id: 0x0
Next hop: 10.0.1.1 via ge-0/0/1.0 balance 60%, selected
Session Id: 0x0
State: <Active Ext>
Local AS: 65000 Peer AS: 65001
Age: 20:33

```

```

Validation State: unverified
Task: BGP_65001.10.0.1.1
Announcement bits (3): 0-KRT 2-BGP_Listen.0.0.0.0+179
3-BGP_RT_Background
AS path: 65001 I
Communities: bandwidth:65000:60000000
Accepted Multipath
Localpref: 100
Router ID: 128.49.121.137
BGP Preference: 170/-101
Next hop type: Router, Next hop index: 595
Address: 0xb7a1330
Next-hop reference count: 9
Source: 10.0.0.2
Next hop: 10.0.0.2 via ge-0/0/0.0, selected
Session Id: 0x141
State: <NotBest Ext>
Inactive reason: Not Best in its group - Active preferred
Local AS: 65000 Peer AS: 65001
Age: 20:33
Validation State: unverified
Task: BGP_65001.10.0.0.2
AS path: 65001 I
Communities: bandwidth:65000:40000000
Accepted MultipathContrib
Localpref: 100
Router ID: 128.49.121.132

```

show route protocol bgp extensive

```

user@host> show route protocol bgp 192.168.64.0/21 extensive

inet.0: 335827 destinations, 335828 routes (335378 active, 0 holddown, 450 hidden)
192.168.64.0/21 (1 entry, 1 announced)
TSI:
KRT in-kernel 1.9.0.0/16 -> {indirect(342)}
Page 0 idx 1 Type 1 val db31a80
  Nexthop: Self
  AS path: [69] 10458 14203 2914 4788 4788 I
  Communities: 2914:410 2914:2403 2914:3400
Path 1.9.0.0 from 192.168.69.71 Vector len 4. Val: 1
  *BGP Preference: 170/-101
    Next hop type: Indirect
    Next-hop reference count: 1006502
    Source: 192.168.69.71
    Next hop type: Router, Next hop index: 324
    Next hop: 192.168.167.254 via fxp0.0, selected
    Protocol next hop: 192.168.69.71
    Indirect next hop: 8e166c0 342
    State: <Active Ext>
    Local AS: 69 Peer AS: 10458
    Age: 6d 10:44:45 Metric2: 0
    Task: BGP_10458.192.168.69.71+179
    Announcement bits (3): 0-KRT 2-BGP RT Background 3-Resolve tree
1
  AS path: 10458 14203 2914 4788 4788 I
  Communities: 2914:410 2914:2403 2914:3400
  Accepted
  Localpref: 100
  Router ID: 207.17.136.192
  Indirect next hops: 1

```

```

Protocol next hop: 192.168.69.71
Indirect next hop: 8e166c0 342
Indirect path forwarding next hops: 1
  Next hop type: Router
  Next hop: 192.168.167.254 via fxp0.0
192.168.0.0/16 Originating RIB: inet.0
  Node path count: 1
  Forwarding nexthops: 1
  Nexthop: 192.168.167.254 via fxp0.0

```

show route protocol bgp terse

```
user@host> show route protocol bgp 192.168.64.0/21 terse
```

```

inet.0: 24 destinations, 32 routes (23 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
192.168.64.0/21   B 170      100          >172.16.100.1 10023 21 I

```

show route protocol direct

```
user@host> show route protocol direct
```

```

inet.0: 335843 destinations, 335844 routes (335394 active, 0 holddown, 450 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

172.16.8.0/24      *[Direct/0] 17w0d 10:31:49
> via fe-1/3/1.0
10.255.165.1/32    *[Direct/0] 25w4d 04:13:18
> via lo0.0
172.16.30.0/24     *[Direct/0] 17w0d 23:06:26
> via fe-1/3/2.0
192.168.164.0/22   *[Direct/0] 25w4d 04:13:20
> via fxp0.0

```

```

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

47.0005.80ff.f800.0000.0108.0001.0102.5516.5001/152
*[Direct/0] 25w4d 04:13:21
> via lo0.0

```

```

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

2001:db8::10:255:165:1/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0
fe80::2a0:a5ff:fe12:ad7/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0

```

show route protocol frr

```
user@host> show route protocol frr
```

```
inet.0: 43 destinations, 43 routes (42 active, 0 holddown, 1 hidden)
```

```
inet.3: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
```

```

cust1.inet.0: 1033 destinations, 2043 routes (1033 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

20.20.1.3/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.3 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.4/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.4 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.5/32      *[FRR/200] 00:05:35, from 20.20.1.1
                  > to 20.20.1.5 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.6/32      *[FRR/200] 00:05:37, from 20.20.1.1
                  > to 20.20.1.6 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.7/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.7 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.8/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.8 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.9/32      *[FRR/200] 00:05:38, from 20.20.1.1
                  > to 20.20.1.9 via ge-4/1/0.0
                  to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.10/32     *[FRR/200] 00:05:38, from 20.20.1.1
...

```

show route protocol l2circuit detail

```

user@host> show route protocol l2circuit detail

```

```

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
100000 (1 entry, 1 announced)

```

```

  *L2CKT Preference: 7
    Next hop: via ge-2/0/0.0, selected
    Label operation: Pop      Offset: 4
    State: <Active Int>
    Local AS: 99
    Age: 9:52
    Task: Common L2 VC
    Announcement bits (1): 0-KRT
    AS path: I

```

```

ge-2/0/0.0 (1 entry, 1 announced)

```

```

  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000, Push 100000(top)[0] Offset: -4
    Protocol next hop: 10.245.255.63
    Push 100000 Offset: -4
    Indirect next hop: 86af0c0 298
    State: <Active Int>
    Local AS: 99
    Age: 9:52
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 1-Common L2 VC
    AS path: I

```

```

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

```

```

10.245.255.63:CtrlWord:4:3:Local/96 (1 entry, 1 announced)

```

```

*L2CKT Preference: 7
Next hop: via so-1/1/2.0 weight 1, selected
Label-switched-path my-lsp
Label operation: Push 100000[0]
Protocol next hop: 10.245.255.63 Indirect next hop: 86af000 296
State: <Active Int>
Local AS: 99
Age: 10:21
Task: l2 circuit
Announcement bits (1): 0-LDP
AS path: I
VC Label 100000, MTU 1500, VLAN ID 512

```

show route protocol l2vpn extensive

```

user@host> show route protocol l2vpn extensive

inet.0: 14 destinations, 15 routes (13 active, 0 holddown, 1 hidden)

inet.3: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
800001 (1 entry, 1 announced)
TSI:
KRT in-kernel 800001 /36 -> {so-0/0/0.0}
    *L2VPN Preference: 7
      Next hop: via so-0/0/0.0 weight 49087 balance 97%, selected
      Label operation: Pop      Offset: 4
      State: <Active Int>
      Local AS: 69
      Age: 7:48
      Task: Common L2 VC
      Announcement bits (1): 0-KRT
      AS path: I

so-0/0/0.0 (1 entry, 1 announced)
TSI:
KRT in-kernel so-0/0/0.0.0 /16 -> {indirect(288)}
    *L2VPN Preference: 7
      Next hop: via so-0/0/1.0, selected
      Label operation: Push 800000 Offset: -4
      Protocol next hop: 10.255.14.220
      Push 800000 Offset: -4
      Indirect next hop: 85142a0 288
      State: <Active Int>
      Local AS: 69
      Age: 7:48
      Task: Common L2 VC
      Announcement bits (2): 0-KRT 1-Common L2 VC
      AS path: I
      Communities: target:69:1 Layer2-info: encaps:PPP,
      control flags:2, mtu: 0

```

show route protocol ldp

```

user@host> show route protocol ldp

inet.0: 12 destinations, 13 routes (12 active, 0 holddown, 0 hidden)

```

```

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.16.1/32    *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Push 100000
192.168.17.1/32    *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0

private1___.inet.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

mpls.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

100064            *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Pop
100064(S=0)        *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Pop
100080            *[LDP/9] 1d 23:03:35, metric 1
                  > via t1-4/0/0.0, Swap 100000

```

show route protocol ldp extensive

```

user@host> show route protocol ldp extensive
192.168.16.1/32 (1 entry, 1 announced)
  State: <FlashAll>
    *LDP Preference: 9
      Next-hop reference count: 3
      Next hop: via t1-4/0/0.0, selected
      Label operation: Push 100000
      State: <Active Int>
      Local AS: 64500
      Age: 1d 23:03:58      Metric: 1
      Task: LDP
      Announcement bits (2): 0-Resolve tree 1 2-Resolve tree 2
      AS path: I

192.168.17.1/32 (1 entry, 1 announced)
  State: <FlashAll>
    *LDP Preference: 9
      Next-hop reference count: 3
      Next hop: via t1-4/0/0.0, selected
      State: <Active Int>
      Local AS: 64500
      Age: 1d 23:03:58      Metric: 1
      Task: LDP
      Announcement bits (2): 0-Resolve tree 1 2-Resolve tree 2
      AS path: I

private1___.inet.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

mpls.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)

100064 (1 entry, 1 announced)
TSI:
KRT in-kernel 100064 /36 -> {t1-4/0/0.0}
  *LDP Preference: 9
    Next-hop reference count: 2
    Next hop: via t1-4/0/0.0, selected
    State: <Active Int>
    Local AS: 64500
    Age: 1d 23:03:58      Metric: 1

```



```

Task: LDP
Announcement bits (1): 0-KRT
AS path: I
Prefixes bound to route: 192.168.17.1/32

100064(S=0) (1 entry, 1 announced)
TSI:
KRT in-kernel 100064 /40 -> {t1-4/0/0.0}
    *LDP    Preference: 9
            Next-hop reference count: 2
            Next hop: via t1-4/0/0.0, selected
            Label operation: Pop
            State: <Active Int>
            Local AS: 64500
            Age: 1d 23:03:58      Metric: 1
            Task: LDP
            Announcement bits (1): 0-KRT
            AS path: I

100080 (1 entry, 1 announced)
TSI:
KRT in-kernel 100080 /36 -> {t1-4/0/0.0}
    *LDP    Preference: 9
            Next-hop reference count: 2
            Next hop: via t1-4/0/0.0, selected
            Label operation: Swap 100000
            State: <Active Int>
            Local AS: 64500
            Age: 1d 23:03:58      Metric: 1
            Task: LDP
            Announcement bits (1): 0-KRT
            AS path: I
            Prefixes bound to route: 192.168.16.1/32

```

show route protocol ospf (Layer 3 VPN)

```

user@host> show route protocol ospf
inet.0: 40 destinations, 40 routes (39 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.4/30      *[OSPF/10] 00:05:18, metric 4
                  > via t3-3/2/0.0
10.39.1.8/30      [OSPF/10] 00:05:18, metric 2
                  > via t3-3/2/0.0
10.255.14.171/32 *[OSPF/10] 00:05:18, metric 4
                  > via t3-3/2/0.0
10.255.14.179/32 *[OSPF/10] 00:05:18, metric 2
                  > via t3-3/2/0.0
172.16.233.5/32  *[OSPF/10] 20:25:55, metric 1

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.16/30     [OSPF/10] 00:05:43, metric 1
                  > via so-0/2/2.0
10.255.14.173/32  *[OSPF/10] 00:05:43, metric 1
                  > via so-0/2/2.0
172.16.233.5/32  *[OSPF/10] 20:26:20, metric 1

```

show route protocol ospf detail

```

user@host> show route protocol ospf detail
VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.16/30 (2 entries, 0 announced)
  OSPF Preference: 10
    Nexthop: via so-0/2/2.0, selected
    State: <Int>
    Inactive reason: Route Preference
    Age: 6:25 Metric: 1
    Area: 0.0.0.0
    Task: VPN-AB-OSPF
    AS path: I
    Communities: Route-Type:0.0.0.0:1:0

...

```

show route protocol rip

```

user@host> show route protocol rip
inet.0: 26 destinations, 27 routes (25 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.255.14.177/32 * [RIP/100] 20:24:34, metric 2
                  > to 10.39.1.22 via t3-0/2/2.0
172.16.233.9/32 * [RIP/100] 00:03:59, metric 1

```

show route protocol rip detail

```

user@host> show route protocol rip detail
inet.0: 26 destinations, 27 routes (25 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

VPN-AB.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
10.255.14.177/32 (1 entry, 1 announced)
  *RIP Preference: 100
    Nexthop: 10.39.1.22 via t3-0/2/2.0, selected
    State: <Active Int>
    Age: 20:25:02 Metric: 2
    Task: VPN-AB-RIPv2
    Announcement bits (2): 0-KRT 2-BGP.0.0.0.0+179
    AS path: I
    Route learned from 10.39.1.22 expires in 96 seconds

```

show route protocol ripng table inet6

```

user@host> show route protocol ripng table inet6
inet6.0: 4215 destinations, 4215 routes (4214 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

1111::1/128 * [RIPng/100] 02:13:33, metric 2
              > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::2/128 * [RIPng/100] 02:13:33, metric 2
              > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::3/128 * [RIPng/100] 02:13:33, metric 2

```

```

1111::4/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
1111::5/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
1111::6/128      > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
                  *[RIPng/100] 02:13:33, metric 2
                  > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0

```

show route protocol static detail

```

user@host> show route protocol static detail
inet.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
10.5.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Router, Next hop index: 324
    Address: 0x9274010
    Next-hop reference count: 27
    Next hop: 192.168.187.126 via fxp0.0, selected
    Session Id: 0x0
    State: <Active NoReadvrt Int Ext>
    Age: 7w3d 21:24:25
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

10.10.0.0/16 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Router, Next hop index: 324
    Address: 0x9274010
    Next-hop reference count: 27
    Next hop: 192.168.187.126 via fxp0.0, selected
    Session Id: 0x0
    State: <Active NoReadvrt Int Ext>
    Age: 7w3d 21:24:25
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

10.13.10.0/23 (1 entry, 1 announced)
  *Static Preference: 5
    Next hop type: Router, Next hop index: 324
    Address: 0x9274010
    Next-hop reference count: 27
    Next hop: 192.168.187.126 via fxp0.0, selected
    Session Id: 0x0
    State: <Active NoReadvrt Int Ext>
    Age: 7w3d 21:24:25
    Validation State: unverified
    Task: RT
    Announcement bits (1): 0-KRT
    AS path: I

```

show route receive-protocol

List of Syntax	Syntax on page 632 Syntax (EX Series Switches) on page 632
Syntax	<code>show route receive-protocol <i>protocol neighbor-address</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)</code>
Syntax (EX Series Switches)	<code>show route receive-protocol <i>protocol neighbor-address</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display the routing information as it was received through a particular neighbor using a particular dynamic routing protocol.
Options	brief detail extensive terse —(Optional) Display the specified level of output. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>protocol neighbor-address</i> —Protocol transmitting the route (bgp , dvmrp , msdp , pim , rip , or ripng) and address of the neighboring router from which the route entry was received.
Additional Information	The output displays the selected routes and the attributes with which they were received, but does not show the effects of import policy on the routing attributes.
Required Privilege Level	view
List of Sample Output	show route receive-protocol bgp on page 635 show route receive-protocol bgp extensive on page 635 show route receive-protocol bgp table extensive on page 636 show route receive-protocol bgp logical-system extensive on page 636 show route receive-protocol bgp detail (Layer 2 VPN) on page 637 show route receive-protocol bgp extensive (Layer 2 VPN) on page 637 show route receive-protocol bgp (Layer 3 VPN) on page 638 show route receive-protocol bgp detail (Layer 3 VPN) on page 638 show route receive-protocol bgp detail (Long-Lived Graceful Restart) on page 639 show route receive-protocol bgp detail (Labeled Unicast) on page 639 show route receive-protocol bgp extensive (Layer 3 VPN) on page 640 Show route receive protocol (Segment Routing Traffic Engineering) on page 640

Output Fields Table 27 on page 414 describes the output fields for the **show route receive-protocol** command. Output fields are listed in the approximate order in which they appear.

Table 48: show route receive-protocol Output Fields

Field Name	Field Description	Level of Output
<i>routing-table-name</i>	Name of the routing table—for example, inet.0.	All levels
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.	All levels
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active • holddown (routes that are in pending state before being declared inactive) • hidden (routes that are not used because of a routing policy) 	All levels
Prefix	Destination prefix.	none brief
MED	Multiple exit discriminator value included in the route.	none brief
<i>destination-prefix</i> (entry, announced)	Destination prefix. The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination.	detail extensive
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag.	detail extensive
Accepted LongLivedStaleImport	The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag may be displayed for a route. Neither of these flags are displayed at the same time as the Stale (ordinary GR stale) flag. Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table	detail extensive
ImportAccepted LongLivedStaleImport	Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.	detail extensive
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.	detail extensive
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.	detail extensive

Table 48: show route receive-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
VPN Label	Virtual private network (VPN) label. Packets are sent between CE and PE routing devices by advertising VPN labels. VPN labels transit over either an RSVP or an LDP label-switched path (LSP) tunnel.	detail extensive
Next hop	Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.	All levels
Localpref or Lclpref	Local preference value included in the route.	All levels
AS path	<p>Autonomous system (AS) path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used the AS-path merge process, as defined in RFC 4893. • []—If more than one AS number is configured on the router, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>	All levels
Route Labels	Stack of labels carried in the BGP route update.	detail extensive
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.	detail extensive
Originator ID	(For route reflected output only) Address of routing device that originally sent the route to the route reflector.	detail extensive
Communities	Community path attribute for the route. See the Output Field table in the show route detail command for all possible values for this field.	detail extensive
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.	detail extensive
Attrset AS	Number, local preference, and path of the AS that originated the route. These values are stored in the Attrset attribute at the originating routing device.	detail extensive

Table 48: show route receive-protocol Output Fields (*continued*)

Field Name	Field Description	Level of Output
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).	detail extensive
control flags	Control flags: none or Site Down.	detail extensive
mtu	Maximum transmission unit (MTU) of the Layer 2 circuit.	detail extensive

Sample Output

show route receive-protocol bgp

```

user@host> show route receive-protocol bgp 10.255.245.215

inet.0: 28 destinations, 33 routes (27 active, 0 holddown, 1 hidden)
Prefix          Next hop          MED      Lclpref  AS path
10.22.1.0/24     10.255.245.215    0        100      I
10.22.2.0/24     10.255.245.215    0        100      I

```

show route receive-protocol bgp extensive

```

user@host> show route receive-protocol bgp 10.255.245.63 extensive
inet.0: 244 destinations, 244 routes (243 active, 0 holddown, 1 hidden)
Prefix          Next hop          MED      Lclpref  AS path
172.16.1.0/24 (1 entry, 1 announced)
  Next hop: 10.0.50.3
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.45
172.16.163.0/16 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.68
172.16.164.0/16 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.45
172.16.195.0/24 (1 entry, 1 announced)
  Next hop: 111.222.5.254
  Localpref: 100
  AS path: I <Originator>
  Cluster list: 10.2.3.1
  Originator ID: 10.255.245.68
inet.2: 63 destinations, 63 routes (63 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
inet.3: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Next hop          MED      Lclpref  AS path
mpls.0: 48 destinations, 48 routes (48 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp table extensive

```
user@host> show route receive-protocol bgp 207.17.136.192 table inet.0 66.117.68.0/24 extensive
inet.0: 227315 destinations, 227316 routes (227302 active, 0 holddown, 13 hidden)
* 66.117.63.0/24 (1 entry, 1 announced)
  Nexthop: 207.17.136.29
  Localpref: 100
  AS path: AS2 PA[6]: 14203 2914 3356 29748 33437 AS_TRANS
  AS path: AS4 PA[2]: 33437 393219
  AS path: Merged[6]: 14203 2914 3356 29748 33437 393219 I
  Communities: 2914:420
```

show route receive-protocol bgp logical-system extensive

```
user@host> show route receive-protocol bgp 10.0.0.9 logical-system PE4 extensive
inet.0: 12 destinations, 13 routes (12 active, 0 holddown, 0 hidden)
* 10.0.0.0/30 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.0.0.4/30 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

10.0.0.8/30 (2 entries, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.9.9.1/32 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 10.100.1.1/32 (1 entry, 1 announced)
  Accepted
  Route Label: 3
  Nexthop: 10.0.0.9
  AS path: 13979 I

* 172.16.44.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300096
  Nexthop: 10.0.0.9
  AS path: 13979 I
  AIGP: 203

* 172.16.55.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300112
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I
  AIGP: 25
```



```
* 172.16.66.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300144
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I

* 172.16.99.0/24 (1 entry, 1 announced)
  Accepted
  Route Label: 300160
  Nexthop: 10.0.0.9
  AS path: 13979 7018 I
```

show route receive-protocol bgp detail (Layer 2 VPN)

```
user@host> show route receive-protocol bgp 10.255.14.171 detail
inet.0: 68 destinations, 68 routes (67 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
inet.3: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
mpls.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
frame-vpn.12vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0
hidden)
Prefix          Nexthop          MED      Lc1pref AS path
10.255.245.35:1:5:1/96 (1 entry, 1 announced)
  Route Distinguisher: 10.255.245.35:1
  Label-base : 800000, range : 4, status-vector : 0x0
  Nexthop: 10.255.245.35
  Localpref: 100
  AS path: I
  Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags: 0, mtu: 0
bgp.12vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
10.255.245.35:1:5:1/96 (1 entry, 0 announced)
  Route Distinguisher: 10.255.245.35:1
  Label-base : 800000, range : 4, status-vector : 0x0
  Nexthop: 10.255.245.35
  Localpref: 100
  AS path: I
  Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0
```

show route receive-protocol bgp extensive (Layer 2 VPN)

```
user@host> show route receive-protocol bgp 10.255.14.171 extensive
inet.0: 68 destinations, 68 routes (67 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
inet.3: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
mpls.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
frame-vpn.12vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED      Lc1pref AS path
10.255.245.35:1:5:1/96 (1 entry, 1 announced)
  Route Distinguisher: 10.255.245.35:1
```

```

Label-base : 800000, range : 4, status-vector : 0x0
Nexthop: 10.255.245.35
Localpref: 100
AS path: I
Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0
bgp.12vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.245.35:1:5:1/96 (1 entry, 0 announced)
Route Distinguisher: 10.255.245.35:1
Label-base : 800000, range : 4, status-vector : 0x0
Nexthop: 10.255.245.35
Localpref: 100
AS path: I
Communities: target:65299:100 Layer2-info: encaps:FRAME RELAY,
control flags:0, mtu: 0

```

show route receive-protocol bgp (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.171
inet.0: 33 destinations, 33 routes (32 active, 0 holddown, 1 hidden)
Prefix          Nexthop          MED    Lclpref AS path
inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
VPN-A.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.175/32 10.255.14.171          100 2 I
10.255.14.179/32 10.255.14.171          2    100 I
VPN-B.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.175/32 10.255.14.171          100 2 I
10.255.14.177/32 10.255.14.171          100 I
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
mpls.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
bgp.13vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
Prefix          Nexthop          MED    Lclpref AS path
10.255.14.171:300:10.255.14.177/32
10.255.14.171          100 I
10.255.14.171:100:10.255.14.179/32
10.255.14.171          2    100 I
10.255.14.171:200:10.255.14.175/32
10.255.14.171          100 2 I

```

show route receive-protocol bgp detail (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.14.174 detail
inet.0: 16 destinations, 17 routes (15 active, 0 holddown, 1 hidden)
inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
vpna.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
* 10.49.0.0/30 (1 entry, 1 announced)
Route Distinguisher: 10.255.14.176:2
VPN Label: 101264
Nexthop: 10.255.14.174
Localpref: 100
AS path: I
Communities: target:200:100
AttrSet AS: 100
Localpref: 100

```

```

        AS path: I
* 10.255.14.172/32 (1 entry, 1 announced)
  Route Distinguisher: 10.255.14.176:2
  VPN Label: 101280
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
bgp.l3vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
* 10.255.14.174:2:10.49.0.0/30 (1 entry, 0 announced)
  Route Distinguisher: 10.255.14.174:2
  VPN Label: 101264
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
* 10.255.14.174:2:10.255.14.172/32 (1 entry, 0 announced)
  Route Distinguisher: 10.255.14.174:2
  VPN Label: 101280
  Nexthop: 10.255.14.174
  Localpref: 100
  AS path: I
  Communities: target:200:100
  AttrSet AS: 100
    Localpref: 100
    AS path: I
inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp detail (Long-Lived Graceful Restart)

```

user@host> show route receive-protocol bgp 10.4.12.11 detail

bgp.l2vpn.0: 38 destinations, 39 routes (37 active, 0 holddown, 1 hidden)
* 172.16.1.4:100:172.16.1.4/96 AD (1 entry, 1 announced)
  Accepted LongLivedStale LongLivedStaleImport
  Nexthop: 10.4.12.11
  Localpref: 100
  AS path: I

```

show route receive-protocol bgp detail (Labeled Unicast)

```

user@host> show route receive-protocol bgp 1.1.1.1 detail
inet.0: 45 destinations, 46 routes (45 active, 0 holddown, 0 hidden)
* 1.1.1.8/32 (2 entries, 2 announced)
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: 1.1.1.4
Localpref: 100
AS path: I
Entropy label capable, next hop field matches route next hop

inet.3: 15 destinations, 21 routes (6 active, 0 holddown, 14 hidden)

```

```

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 11 destinations, 11 routes (11 active, 0 holddown, 0 hidden)

inet6.0: 26 destinations, 28 routes (26 active, 0 holddown, 0 hidden)

* 100::1/128 (2 entries, 2 announced)
Accepted
Route Labels: 1000123(top) 1000124 1000125 1000126
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: I

inet6.3: 22 destinations, 23 routes (22 active, 0 holddown, 0 hidden)

```

show route receive-protocol bgp extensive (Layer 3 VPN)

```

user@host> show route receive-protocol bgp 10.255.245.63 extensive
inet.0: 244 destinations, 244 routes (243 active, 0 holddown, 1 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
  172.16.1.0/24 (1 entry, 1 announced)
    Nexthop: 10.0.50.3
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.45
  172.16.163.0/16 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.68
  172.16.164.0/16 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.45
  172.16.195.0/24 (1 entry, 1 announced)
    Nexthop: 111.222.5.254
    Localpref: 100
    AS path: I <Originator>
    Cluster list: 10.2.3.1
    Originator ID: 10.255.245.68
inet.2: 63 destinations, 63 routes (63 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
inet.3: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
  Prefix          Nexthop          MED      Lclpref AS path
mpls.0: 48 destinations, 48 routes (48 active, 0 holddown, 0 hidden)

```

Show route receive protocol (Segment Routing Traffic Engineering)

```

show route receive protocol bgp 10.1.1.4
bgp.inetcolor.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

* 50-4.4.4.4-1234<sr6>/96 (1 entry, 0 announced)
  Import Accepted

```

```
Distinguisher: 50
Color: 1234
Nexthop: 10.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
inetcolor.0: 6 destinations, 7 routes (6 active, 0 holddown, 0 hidden)
```

```
* 4.4.4.4-1234<c6>/64 (1 entry, 1 announced)
```

```
Import Accepted
Color: 1234
Nexthop: 10.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
user@host# run show route receive-protocol bgp 5001:1::4
```

```
bgp.inet6color.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
```

```
* 50-2001:1::4-1234<sr6>/192 (1 entry, 0 announced)
```

```
Import Accepted
Distinguisher: 50
Color: 1234
Nexthop: ::ffff:1.1.1.4
Localpref: 100
AS path: 3 I
Communities: target:1.1.1.1:1
```

```
inet6color.0: 6 destinations, 7 routes (6 active, 0 holddown, 0 hidden)
```

```
* 2001::5-1234<c6>/160 (1 entry, 1 announced)
```

```
Import Accepted
Color: 1234
Nexthop: ::ffff:1.1.1.5
Localpref: 100
AS path: 3 I
Communities: target:2:1
```

show route table

List of Syntax	Syntax on page 642 Syntax (EX Series Switches, QFX Series Switches) on page 642
Syntax	<code>show route table <i>routing-table-name</i></code> <code><brief detail extensive terse></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Syntax (EX Series Switches, QFX Series Switches)	<code>show route table <i>routing-table-name</i></code> <code><brief detail extensive terse></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 14.1X53-D15 for QFX Series switches. Show route table evpn statement introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.
Description	Display the route entries in a particular routing table.
Options	brief detail extensive terse —(Optional) Display the specified level of output. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system. <i>routing-table-name</i> —Display route entries for all routing tables whose names begin with this string (for example, inet.0 and inet6.0 are both displayed when you run the show route table inet command).
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show route summary
List of Sample Output	show route table bgp.l2.vpn on page 653 show route table bgp.l3vpn.0 on page 653 show route table bgp.l3vpn.0 detail on page 654 show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured) on page 655 show route table bgp.evpn.0 on page 655 show route table evpna.evpn.0 on page 656 show route table inet.0 on page 656 show route table inet.3 on page 657 show route table inet.3 protocol ospf on page 657 show route table inet6.0 on page 657 show route table inet6.3 on page 657

[show route table inetflow detail on page 658](#)
[show route table lsdist.0 extensive on page 658](#)
[show route table l2circuit.0 on page 660](#)
[show route table mpls on page 660](#)
[show route table mpls extensive on page 660](#)
[show route table mpls.0 on page 661](#)
[show route table mpls.0 detail \(PTX Series\) on page 662](#)
[show route table mpls.0 ccc ge-0/0/1.1004 detail on page 662](#)
[show route table mpls.0 protocol evpn on page 663](#)
[show route table mpls.0 protocol ospf on page 669](#)
[show route table mpls.0 extensive \(PTX Series\) on page 670](#)
[show route table mpls.0 \(RSVP Route—Transit LSP\) on page 670](#)
[show route table vpls_1 detail on page 671](#)
[show route table vpn-a on page 671](#)
[show route table vpn-a.mdt.0 on page 671](#)
[show route table VPN-A detail on page 672](#)
[show route table VPN-AB.inet.0 on page 672](#)
[show route table VPN_blue.mvpn-inet6.0 on page 673](#)
[show route table vrf1.mvpn.0 extensive on page 673](#)
[show route table inetflow detail on page 673](#)
[show route table bgp.evpn.0 extensive |no-more \(EVPN\) on page 676](#)

Output Fields [Table 17 on page 275](#) describes the output fields for the **show route table** command. Output fields are listed in the approximate order in which they appear.

Table 49: show route table Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
Restart complete	<p>All protocols have restarted for this routing table.</p> <p>Restart state:</p> <ul style="list-style-type: none"> • Pending:<i>protocol-name</i>—List of protocols that have not yet completed graceful restart for this routing table. • Complete—All protocols have restarted for this routing table. <p>For example, if the output shows-</p> <ul style="list-style-type: none"> • LDP.inet.0 : 5 routes (4 active, 1 holddown, 0 hidden) Restart Pending: OSPF LDP VPN <p>This indicates that OSPF, LDP, and VPN protocols did not restart for the LDP.inet.0 routing table.</p> <ul style="list-style-type: none"> • vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden) Restart Complete <p>This indicates that all protocols have restarted for the vpls_1.l2vpn.0 routing table.</p>
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route-destination</i> (entry, announced)	<p>Route destination (for example:10.0.0.1/24). The entry value is the number of routes for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote. • inclusive multicast Ethernet tag route—Type of route destination represented by (for example, 3:100.100.100.10:100::0::10::100.100.100.10/384): <ul style="list-style-type: none"> • route distinguisher—(8 octets) Route distinguisher (RD) must be the RD of the EVPN instance (EVI) that is advertising the NLRI. • Ethernet tag ID—(4 octets) Identifier of the Ethernet tag. Can set to 0 or to a valid Ethernet tag value. • IP address length—(1 octet) Length of IP address in bits. • originating router's IP address—(4 or 16 octets) Must set to the provider edge (PE) device's IP address. This address should be common for all EVIs on the PE device, and may be the PE device's loopback address.
<i>label stacking</i>	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of 2 or more exits this routing device with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • - —A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>
Level	(IS-IS only). In IS-IS, a single AS can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).
Next-hop type	Type of next hop. For a description of possible values for this field, see Table 20 on page 319 .
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path <i>lsp-path-name</i>	Name of the LSP used to reach the next hop.

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to derive a forwarding next hop.
Indirect next hop	Index designation used to specify the mapping between protocol next hops, tags, kernel export policy, and the forwarding next hops.
State	State of the route (a route can be in more than one state). See Table 21 on page 321 .
Local AS	AS number of the local routing devices.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances.
Task	Name of the protocol that has added the route.
Announcement bits	<p>The number of BGP peers or protocols to which Junos OS has announced this route, followed by the list of the recipients of the announcement. Junos OS can also announce the route to the kernel routing table (KRT) for installing the route into the Packet Forwarding Engine, to a resolve tree, a Layer 2 VC, or even a VPN. For example, <i>n-Resolve inet</i> indicates that the specified route is used for route resolution for next hops found in the routing table.</p> <ul style="list-style-type: none"> <i>n</i>—An index used by Juniper Networks customer support only.

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • Recorded—The AS path is recorded by the sample process (sampled). • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the number that precedes the AS path. This number represents the number of ASs present in the AS path, when calculated as defined in RFC 4271. This value is used in the AS-path merge process, as defined in RFC 4893. • []—If more than one AS number is configured on the routing device, or if AS path prepending is configured, brackets enclose the local AS number associated with the AS path. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
FECs bound to route	Indicates point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, indicates the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, indicates the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Prefixes bound to route	Forwarding equivalent class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See Table 22 on page 323 for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down .
mtu	Maximum transmission unit (MTU) information.
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Accepted Multipath	Current active path when BGP multipath is configured.
Accepted LongLivedStale	The LongLivedStale flag indicates that the route was marked LLGR-stale by this router, as part of the operation of LLGR receiver mode. Either this flag or the LongLivedStaleImport flag might be displayed for a route. Neither of these flags is displayed at the same time as the Stale (ordinary GR stale) flag.
Accepted LongLivedStaleImport	<p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy. Either this flag or the LongLivedStale flag might be displayed for a route. Neither of these flags is displayed at the same time as the Stale (ordinary GR stale) flag.</p> <p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and import into the inet.0 routing table</p>
ImportAccepted LongLivedStaleImport	<p>Accept all received BGP long-lived graceful restart (LLGR) and LLGR stale routes learned from configured neighbors and imported into the inet.0 routing table</p> <p>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.</p>
Accepted MultipathContrib	Path currently contributing to BGP multipath.
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.

Table 49: show route table Output Fields (*continued*)

Field Name	Field Description
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.

Table 20 on page 319 describes all possible values for the Next-hop Types output field.

Table 50: Next-hop Types Output Field Values

Next-Hop Type	Description
Broadcast (bcast)	Broadcast next hop.
Deny	Deny next hop.
Discard	Discard next hop.
Flood	Flood next hop. Consists of components called branches, up to a maximum of 32 branches. Each flood next-hop branch sends a copy of the traffic to the forwarding interface. Used by point-to-multipoint RSVP, point-to-multipoint LDP, point-to-multipoint CCC, and multicast.
Hold	Next hop is waiting to be resolved into a unicast or multicast type.
Indexed (idxd)	Indexed next hop.
Indirect (indr)	Used with applications that have a protocol next hop address that is remote. You are likely to see this next-hop type for internal BGP (IBGP) routes when the BGP next hop is a BGP neighbor that is not directly connected.
Interface	Used for a network address assigned to an interface. Unlike the router next hop, the interface next hop does not reference any specific node on the network.
Local (locl)	Local address on an interface. This next-hop type causes packets with this destination address to be received locally.
Multicast (mcst)	Wire multicast next hop (limited to the LAN).
Multicast discard (mdsc)	Multicast discard.
Multicast group (mgrp)	Multicast group member.
Receive (recv)	Receive.
Reject (rjct)	Discard. An ICMP unreachable message was sent.

Table 50: Next-hop Types Output Field Values (*continued*)

Next-Hop Type	Description
Resolve (rslv)	Resolving next hop.
Routed multicast (mcrtr)	Regular multicast next hop.
Router	<p>A specific node or set of nodes to which the routing device forwards packets that match the route prefix.</p> <p>To qualify as a next-hop type router, the route must meet the following criteria:</p> <ul style="list-style-type: none"> • Must not be a direct or local subnet for the routing device. • Must have a next hop that is directly connected to the routing device.
Table	Routing table next hop.
Unicast (ucst)	Unicast.
Unilist (ulst)	List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.

Table 21 on page 321 describes all possible values for the State output field. A route can be in more than one state (for example, <Active NoReadvrt Int Ext>).

Table 51: State Output Field Values

Value	Description
Accounting	Route needs accounting.
Active	Route is active.
Always Compare MED	Path with a lower multiple exit discriminator (MED) is available.
AS path	Shorter AS path is available.
Cisco Non-deterministic MED selection	Cisco nondeterministic MED is enabled, and a path with a lower MED is available.
Clone	Route is a clone.
Cluster list length	Length of cluster list sent by the route reflector.
Delete	Route has been deleted.
Ex	Exterior route.

Table 51: State Output Field Values (*continued*)

Value	Description
Ext	BGP route received from an external BGP neighbor.
FlashAll	Forces all protocols to be notified of a change to any route, active or inactive, for a prefix. When not set, protocols are informed of a prefix only when the active route changes.
Hidden	Route not used because of routing policy.
IfCheck	Route needs forwarding RPF check.
IGP metric	Path through next hop with lower IGP metric is available.
Inactive reason	Flags for this route, which was not selected as best for a particular destination.
Initial	Route being added.
Int	Interior route.
Int Ext	BGP route received from an internal BGP peer or a BGP confederation peer.
Interior > Exterior > Exterior via Interior	Direct, static, IGP, or EIGRP path is available.
Local Preference	Path with a higher local preference value is available.
Martian	Route is a martian (ignored because it is obviously invalid).
MartianOK	Route exempt from martian filtering.
Next hop address	Path with lower metric next hop is available.
No difference	Path from neighbor with lower IP address is available.
NoRedvrt	Route not to be advertised.
NotBest	Route not chosen because it does not have the lowest MED.
Not Best in its group	Incoming BGP AS is not the best of a group (only one AS can be the best).
NotInstall	Route not to be installed in the forwarding table.
Number of gateways	Path with a greater number of next hops is available.
Origin	Path with a lower origin code is available.

Table 51: State Output Field Values (*continued*)

Value	Description
Pending	Route pending because of a hold-down configured on another route.
Release	Route scheduled for release.
RIB preference	Route from a higher-numbered routing table is available.
Route Distinguisher	64-bit prefix added to IP subnets to make them unique.
Route Metric or MED comparison	Route with a lower metric or MED is available.
Route Preference	Route with lower preference value is available.
Router ID	Path through a neighbor with lower ID is available.
Secondary	Route not a primary route.
Unusable path	Path is not usable because of one of the following conditions: <ul style="list-style-type: none"> The route is damped. The route is rejected by an import policy. The route is unresolved.
Update source	Last tiebreaker is the lowest IP address value.

[Table 22 on page 323](#) describes the possible values for the Communities output field.

Table 52: Communities Output Field Values

Value	Description
<i>area-number</i>	4 bytes, encoding a 32-bit area number. For AS-external routes, the value is 0. A nonzero value identifies the route as internal to the OSPF domain, and as within the identified area. Area numbers are relative to a particular OSPF domain.
bandwidth: local AS number:link-bandwidth-number	Link-bandwidth community value used for unequal-cost load balancing. When BGP has several candidate paths available for multipath purposes, it does not perform unequal-cost load balancing according to the link-bandwidth community unless all candidate paths have this attribute.
domain-id	Unique configurable number that identifies the OSPF domain.
domain-id-vendor	Unique configurable number that further identifies the OSPF domain.
<i>link-bandwidth-number</i>	Link-bandwidth number: from 0 through 4,294,967,295 (bytes per second).
<i>local AS number</i>	Local AS number: from 1 through 65,535.

Table 52: Communities Output Field Values (*continued*)

Value	Description
<i>options</i>	1 byte. Currently this is only used if the route type is 5 or 7 . Setting the least significant bit in the field indicates that the route carries a type 2 metric.
<i>origin</i>	(Used with VPNs) Identifies where the route came from.
<i>ospf-route-type</i>	1 byte, encoded as 1 or 2 for intra-area routes (depending on whether the route came from a type 1 or a type 2 LSA); 3 for summary routes; 5 for external routes (area number must be 0); 7 for NSSA routes; or 129 for sham link endpoint addresses.
<i>route-type-vendor</i>	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x8000 . The format is <i>area-number:ospf-route-type:options</i> .
<i>rte-type</i>	Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute 0x0306 . The format is <i>area-number:ospf-route-type:options</i> .
<i>target</i>	Defines which VPN the route participates in; target has the format <i>32-bit IP address:16-bit number</i> . For example, 10.19.0.0:100.
<i>unknown IANA</i>	Incoming IANA codes with a value between 0x1 and 0x7fff . This code of the BGP extended community attribute is accepted, but it is not recognized.
<i>unknown OSPF vendor community</i>	Incoming IANA codes with a value above 0x8000 . This code of the BGP extended community attribute is accepted, but it is not recognized.

Sample Output

show route table bgp.l2vpn

```

user@host> show route table bgp.l2vpn
bgp.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.24.1:1:4:1/96
    *[BGP/170] 01:08:58, localpref 100, from 192.168.24.1
    AS path: I
    > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am

```

show route table bgp.l3vpn.0

```

user@host> show route table bgp.l3vpn.0
bgp.l3vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.255.71.15:100:10.255.71.17/32
    *[BGP/170] 00:03:59, MED 1, localpref 100, from
10.255.71.15
    AS path: I
    > via so-2/1/0.0, Push 100020, Push 100011(top)
10.255.71.15:200:10.255.71.18/32

```

```

10.255.71.15          *[BGP/170] 00:03:59, MED 1, localpref 100, from
                        AS path: I
                        > via so-2/1/0.0, Push 100021, Push 100011(top)

```

show route table bgp.l3vpn.0 detail

```

user@host> show route table bgp.l3vpn.0 detail
bgp.l3vpn.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)

10.255.245.12:1:172.16.4.0/8 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182449
    Protocol next hop: 10.255.245.12
    Push 182449
    Indirect next hop: 863a630 297
    State: <Active Int Ext>
    Local AS: 35 Peer AS: 35
    Age: 12:19 Metric2: 1
    Task: BGP_35.10.255.245.12+179
    Announcement bits (1): 0-BGP.0.0.0.0+179
    AS path: 30 10458 14203 2914 3356 I (Atomic) Aggregator: 3356 4.68.0.11

    Communities: 2914:420 target:11111:1 origin:56:78
    VPN Label: 182449
    Localpref: 100
    Router ID: 10.255.245.12

10.255.245.12:1:4.17.225.0/24 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182465
    Protocol next hop: 10.255.245.12
    Push 182465
    Indirect next hop: 863a8f0 305
    State: <Active Int Ext>
    Local AS: 35 Peer AS: 35
    Age: 12:19 Metric2: 1
    Task: BGP_35.10.255.245.12+179
    Announcement bits (1): 0-BGP.0.0.0.0+179
  AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496 6496 6496 I
    Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
    VPN Label: 182465
    Localpref: 100
    Router ID: 10.255.245.12

10.255.245.12:1:4.17.226.0/23 (1 entry, 1 announced)
  *BGP Preference: 170/-101
    Route Distinguisher: 10.255.245.12:1
    Source: 10.255.245.12
    Next hop: 192.168.208.66 via fe-0/0/0.0, selected
    Label operation: Push 182465
    Protocol next hop: 10.255.245.12
    Push 182465
    Indirect next hop: 86bd210 330
    State: <Active Int Ext>

```

```

Local AS: 35 Peer AS: 35
Age: 12:19 Metric2: 1
Task: BGP_35.10.255.245.12+179
Announcement bits (1): 0-BGP.0.0.0.0+179
AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496

6496 I
Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
VPN Label: 182465
Localpref: 100
Router ID: 10.255.245.12

10.255.245.12:1:4.17.251.0/24 (1 entry, 1 announced)
*BGP Preference: 170/-101
Route Distinguisher: 10.255.245.12:1
Source: 10.255.245.12
Next hop: 192.168.208.66 via fe-0/0/0.0, selected
Label operation: Push 182465
Protocol next hop: 10.255.245.12
Push 182465
Indirect next hop: 86bd210 330
State: <Active Int Ext>
Local AS: 35 Peer AS: 35
Age: 12:19 Metric2: 1
Task: BGP_35.10.255.245.12+179
Announcement bits (1): 0-BGP.0.0.0.0+179
AS path: 30 10458 14203 2914 11853 11853 11853 6496 6496 6496 6496

6496 I
Communities: 2914:410 target:12:34 target:11111:1 origin:12:34
VPN Label: 182465
Localpref: 100

```

show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured)

```

user@host> show route table bgp.rtarget.0
bgp.rtarget.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

100:100:100/96
    *[RTarget/5] 00:03:14
        Type Proxy
        for 10.255.165.103
        for 10.255.166.124
        Local

```

show route table bgp.evpn.0

```

user@host> show route table bgp.evpn.0
bgp.evpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2:100.100.100.2:100::0::00:26:88:5f:67:b0/304
    *[BGP/170] 11:00:05, localpref 100, from 100.100.100.2
        AS path: I, validation-state: unverified
        > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1
2:100.100.100.2:100::0::00:51:51:51:51:51/304
    *[BGP/170] 11:00:05, localpref 100, from 100.100.100.2
        AS path: I, validation-state: unverified
        > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1

```

```

2:100.100.100.3:100::0::00:52:52:52:52:52/304
    *[BGP/170] 10:59:58, localpref 100, from 100.100.100.3
    AS path: I, validation-state: unverified
    > to 100.64.13.3 via ge-2/0/8.0, label-switched-path R0toR2
2:100.100.100.3:100::0:a8:d0:e5:5b:01:c8/304
    *[BGP/170] 10:59:58, localpref 100, from 100.100.100.3
    AS path: I, validation-state: unverified
    > to 100.64.13.3 via ge-2/0/8.0, label-switched-path R0toR2
3:100.100.100.2:100::1000::100.100.100.2/304
    *[BGP/170] 11:00:16, localpref 100, from 100.100.100.2
    AS path: I, validation-state: unverified
    > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1
3:100.100.100.2:100::2000::100.100.100.2/304
    *[BGP/170] 11:00:16, localpref 100, from 100.100.100.2
    AS path: I, validation-state: unverified
    > to 100.64.12.2 via xe-2/2/0.0, label-switched-path R0toR1

```

show route table evpna.evpn.0

```

user@host> show route table evpna.evpn.0
evpna.evpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

3:100.100.100.10:100::0::10::100.100.100.10/384
    *[EVPN/170] 01:37:09
    Indirect
3:100.100.100.2:100::2000::100.100.100.2/304
    *[EVPN/170] 01:37:12
    Indirect

```

show route table inet.0

```

user@host> show route table inet.0
inet.0: 12 destinations, 12 routes (11 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

0.0.0.0/0      *[Static/5] 00:51:57
                > to 172.16.5.254 via fxp0.0
10.0.0.1/32    *[Direct/0] 00:51:58
                > via at-5/3/0.0
10.0.0.2/32    *[Local/0] 00:51:58
                Local
10.12.12.21/32 *[Local/0] 00:51:57
                Reject
10.13.13.13/32 *[Direct/0] 00:51:58
                > via t3-5/2/1.0
10.13.13.14/32 *[Local/0] 00:51:58
                Local
10.13.13.21/32 *[Local/0] 00:51:58
                Local
10.13.13.22/32 *[Direct/0] 00:33:59
                > via t3-5/2/0.0
127.0.0.1/32   [Direct/0] 00:51:58
                > via lo0.0
10.222.5.0/24  *[Direct/0] 00:51:58
                > via fxp0.0
10.222.5.81/32 *[Local/0] 00:51:58
                Local

```

show route table inet.3

```

user@host> show route table inet.3
inet.3: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.0.0.5/32          *[LDP/9] 00:25:43, metric 10, tag 200
                    > to 10.2.94.2 via lt-1/2/0.49
                    > to 10.2.3.2 via lt-1/2/0.23

```

show route table inet.3 protocol ospf

```

user@host> show route table inet.3 protocol ospf
inet.3: 9 destinations, 18 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1.1.1.20/32          [L-OSPF/10] 1d 00:00:56, metric 2
                    > to 10.0.10.70 via lt-1/2/0.14, Push 800020
                    > to 10.0.6.60 via lt-1/2/0.12, Push 800020, Push 800030(top)
1.1.1.30/32          [L-OSPF/10] 1d 00:01:01, metric 3
                    > to 10.0.10.70 via lt-1/2/0.14, Push 800030
                    > to 10.0.6.60 via lt-1/2/0.12, Push 800030
1.1.1.40/32          [L-OSPF/10] 1d 00:01:01, metric 4
                    > to 10.0.10.70 via lt-1/2/0.14, Push 800040
                    > to 10.0.6.60 via lt-1/2/0.12, Push 800040
1.1.1.50/32          [L-OSPF/10] 1d 00:01:01, metric 5
                    > to 10.0.10.70 via lt-1/2/0.14, Push 800050
                    > to 10.0.6.60 via lt-1/2/0.12, Push 800050
1.1.1.60/32          [L-OSPF/10] 1d 00:01:01, metric 6
                    > to 10.0.10.70 via lt-1/2/0.14, Push 800060
                    > to 10.0.6.60 via lt-1/2/0.12, Pop

```

show route table inet6.0

```

user@host> show route table inet6.0
inet6.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Route, * = Both

fec0:0:0:3::/64 *[Direct/0] 00:01:34
>via fe-0/1/0.0

fec0:0:0:3::/128 *[Local/0] 00:01:34
>Local

fec0:0:0:4::/64 *[Static/5] 00:01:34
>to fec0:0:0:3::ffff via fe-0/1/0.0

```

show route table inet6.3

```

user@router> show route table inet6.3
inet6.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

::10.255.245.195/128
                    *[LDP/9] 00:00:22, metric 1
                    > via so-1/0/0.0
::10.255.245.196/128
                    *[LDP/9] 00:00:08, metric 1
                    > via so-1/0/0.0, Push 100008

```

show route table inetflow detail

```

user@host> show route table inetflow detail
inetflow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.12.44.1,*/48 (1 entry, 1 announced)
    *BGP    Preference: 170/-101
            Next-hop reference count: 2
            State: <Active Ext>
            Local AS: 64502 Peer AS: 64500
            Age: 4
            Task: BGP_64500.10.12.99.5+3792
            Announcement bits (1): 0-Flow
            AS path: 64500 I
            Communities: traffic-rate:0:0
            Validation state: Accept, Originator: 10.12.99.5
            Via: 10.12.44.0/24, Active
            Localpref: 100
            Router ID: 10.255.71.161

10.12.56.1,*/48 (1 entry, 1 announced)
    *Flow    Preference: 5
            Next-hop reference count: 2
            State: <Active>
            Local AS: 64502
            Age: 6:30
            Task: RT Flow
            Announcement bits (2): 0-Flow 1-BGP.0.0.0.0+179
            AS path: I
            Communities: 1:1

```

show route table lsdist.0 extensive

```

user@host> show route table lsdist.0 extensive
lsdist.0: 10 destinations, 10 routes (10 active, 0 holddown, 0 hidden)
NODE { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 ISIS-L1:0 }/1152
(1 entry, 1 announced)
TSI:
Page 0 idx 0, (group ibgp type Internal) Type 1 val 0xa62f378 (adv_entry)
  Advertised metrics:
    Nexthop: Self
    Localpref: 100
    AS path: [4170512532] I
    Communities:
Path NODE { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 ISIS-L1:0 }
Vector len 4. Val: 0
    *IS-IS  Preference: 15
            Level: 1
            Next hop type: Fictitious, Next hop index: 0
            Address: 0x95dfc64
            Next-hop reference count: 9
            State: <Active NotInstall>
            Local AS: 4170512532
            Age: 6:05
            Validation State: unverified
            Task: IS-IS
            Announcement bits (1): 0-BGP_RT_Background
            AS path: I
            IPv4 Router-ids:
                128.220.11.197
            Area membership:

```

```

47 00 05 80 ff f8 00 00 00 01 08 00 01
  SPRING-Capabilities:           - SRGB block [Start: 800000,
Range: 256, Flags: 0xc0]
  SPRING-Algorithms:
    - Algo: 0
  LINK { Local { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }.{
IPv4:8.65.1.105 } Remote { AS:4170512532 BGP-LS ID:4170512532 ISO:4284.3300.5067)
TSI:
Page 0 idx 0, (group ibgp type Internal) Type 1 val 0xa62f3cc (adv_entry)
  Advertised metrics:
    Nexthop: Self
    Localpref: 100
    AS path: [4170512532] I
    Communities:
Path LINK { Local { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }.{
IPv4:8.65.1.105 } Remote { AS:4170512532 BGP-LS ID:4170512532 ISO:4284.33000
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0x95dfc64
    Next-hop reference count: 9
    State: <Active NotInstall>
    Local AS: 4170512532
    Age: 6:05
    Validation State: unverified
    Task: IS-IS
    Announcement bits (1): 0-BGP_RT_Background
    AS path: I
    Color: 32768
    Maximum bandwidth: 1000Mbps
    Reservable bandwidth: 1000Mbps
    Unreserved bandwidth by priority:
      0  1000Mbps
      1  1000Mbps
      2  1000Mbps
      3  1000Mbps
      4  1000Mbps
      5  1000Mbps
      6  1000Mbps
      7  1000Mbps
    Metric: 10
    TE Metric: 10
    LAN IPV4 Adj-SID - Label: 299776, Flags: 0x30,
Weight: 0, Nbr: 10.220.1.83

PREFIX { Node { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 } {
IPv4:128.220.11.197/32 } ISIS-L1:0 }/1152 (1 entry, 1 announced) TSI: Page 0 idx
0, (group ibgp type Internal) Type 1 val 0xa62f43c (adv_entry)
  Advertised metrics:
    Nexthop: Self
    Localpref: 100
    AS path: [4170512532] I
    Communities:
Path PREFIX { Node { AS:4170512532 BGP-LS ID:4170512532 ISO:3245.3412.3456.00 }
{ IPv4:128.220.11.197/32 } ISIS-L1:0 } Vector len 4. Val: 0
  *IS-IS Preference: 15
    Level: 1
    Next hop type: Fictitious, Next hop index: 0
    Address: 0x95dfc64
    Next-hop reference count: 9
    State:<Active NotInstall>

```

```

Local AS: 4170512532
Age: 6:05
Validation State: unverified
Task: IS-IS
Announcement bits (1): 0-BGP_RT_Background
AS path: I
Prefix SID: 67, Flags: 0x40, Algo: 0

```

show route table l2circuit.0

```

user@host> show route table l2circuit.0
l2circuit.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.1.1.195:NoCtrlWord:1:1:Local/96
    *[L2CKT/7] 00:50:47
    > via so-0/1/2.0, Push 100049
    > via so-0/1/3.0, Push 100049
10.1.1.195:NoCtrlWord:1:1:Remote/96
    *[LDP/9] 00:50:14
    Discard
10.1.1.195:CtrlWord:1:2:Local/96
    *[L2CKT/7] 00:50:47
    > via so-0/1/2.0, Push 100049
    > via so-0/1/3.0, Push 100049
10.1.1.195:CtrlWord:1:2:Remote/96
    *[LDP/9] 00:50:14
    Discard

```

show route table mpls

```

user@host> show route table mpls
mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0          *[MPLS/0] 00:13:55, metric 1
            Receive
1          *[MPLS/0] 00:13:55, metric 1
            Receive
2          *[MPLS/0] 00:13:55, metric 1
            Receive
1024       *[VPN/0] 00:04:18
            to table red.inet.0, Pop

```

show route table mpls extensive

```

user@host> show route table mpls extensive
100000 (1 entry, 1 announced)
TSI:
KRT in-kernel 100000 /36 -> {so-1/0/0.0}
    *LDP Preference: 9
    Next hop: via so-1/0/0.0, selected
    Pop
    State: <Active Int>
    Age: 29:50 Metric: 1
    Task: LDP
    Announcement bits (1): 0-KRT
    AS path: I
    Prefixes bound to route: 10.0.0.194/32

```


show route table mpls.0

```

user@host> show route table mpls.0
mpls.0: 18 destinations, 19 routes (18 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0                *[MPLS/0] 11:39:56, metric 1
                  to table inet.0
0(S=0)           *[MPLS/0] 11:39:56, metric 1
                  to table mpls.0
1                *[MPLS/0] 11:39:56, metric 1
                  Receive
2                *[MPLS/0] 11:39:56, metric 1
                  to table inet6.0
2(S=0)           *[MPLS/0] 11:39:56, metric 1
                  to table mpls.0
13               *[MPLS/0] 11:39:56, metric 1
                  Receive
303168           *[EVPN/7] 11:00:49, routing-instance pbbn10, route-type
Ingress-MAC, ISID 0
                  to table pbbn10.evpn-mac.0
303184           *[EVPN/7] 11:00:53, routing-instance pbbn10, route-type
Ingress-IM, ISID 1000
                  to table pbbn10.evpn-mac.0
                  [EVPN/7] 11:00:53, routing-instance pbbn10, route-type
Ingress-IM, ISID 2000
                  to table pbbn10.evpn-mac.0
303264           *[EVPN/7] 11:00:53, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-IM, ISID 1000
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303280           *[EVPN/7] 11:00:53, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-IM, ISID 2000
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303328           *[EVPN/7] 11:00:49, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303344           *[EVPN/7] 11:00:49, remote-pe 100.100.100.2, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303360           *[EVPN/7] 11:00:47, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:26:88:5f:67:b0
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303376           *[EVPN/7] 11:00:47, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:51:51:51:51:51
                  > to 100.1.12.2 via xe-2/2/0.0, label-switched-path R0toR1
303392           *[EVPN/7] 11:00:35, remote-pe 100.100.100.3, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303408           *[EVPN/7] 11:00:35, remote-pe 100.100.100.3, routing-instance
pbbn10, route-type Egress-MAC, ISID 0
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303424           *[EVPN/7] 11:00:33, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC a8:d0:e5:5b:01:c8
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2
303440           *[EVPN/7] 11:00:33, routing-instance pbbn10, route-type
Egress-MAC, ISID 0, BMAC 00:52:52:52:52:52
                  > to 100.1.13.3 via ge-2/0/8.0, label-switched-path R0toR2

```

show route table mpls.0 detail (PTX Series)

```

user@host> show route table mpls.0 detail
ge-0/0/2.600 (1 entry, 1 announced)
  *L2VPN Preference: 7
    Next hop type: Indirect
    Address: 0x9438f34
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 567
    Next hop: 10.0.0.1 via ge-0/0/1.0, selected
    Label operation: Push 299808
    Label TTL action: prop-ttl
    Load balance label: Label 299808:None;
    Session Id: 0x1
    Protocol next hop: 10.255.255.1
    Label operation: Push 299872 Offset: 252
    Label TTL action: no-prop-ttl
    Load balance label: Label 299872:Flow label PUSH;
    Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
    Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
    State: <Active Int>
    Age: 21 Metric2: 1
    Validation State: unverified
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 2-Common L2 VC
    AS path: I

```

show route table mpls.0 ccc ge-0/0/1.1004 detail

```

user@host>show route table mpls.0 ccc ge-0/0/1.1004 detail
mpls.0: 121 destinations, 121 routes (121 active, 0 holddown, 0 hidden)
ge-0/0/1.1004 (1 entry, 1 announced)
  *EVPN Preference: 7
    Next hop type: List, Next hop index: 1048577
    Address: 0xdc14770
    Next-hop reference count: 3
    Next hop: ELNH Address 0xd011e30
      Next hop type: Indirect, Next hop index: 0
      Address: 0xd011e30
      Next-hop reference count: 3
      Protocol next hop: 100.100.100.1
      Label operation: Push 301952
      Composite next hop: 0xd011dc0 754 INH Session ID: 0x146
      Indirect next hop: 0xb69a890 1048615 INH Session ID: 0x146
        Next hop type: Router, Next hop index: 735
        Address: 0xd00e530
        Next-hop reference count: 23
        Next hop: 100.46.1.2 via ge-0/0/5.0
        Label-switched-path pe4_to_pe1
        Label operation: Push 300320
        Label TTL action: prop-ttl
        Load balance label: Label 300320: None;
        Label element ptr: 0xd00e580
        Label parent element ptr: 0x0
        Label element references: 18
        Label element child references: 16
        Label element lsp id: 5
    Next hop: ELNH Address 0xd012070
      Next hop type: Indirect, Next hop index: 0
      Address: 0xd012070

```

```

Next-hop reference count: 3
Protocol next hop: 100.100.100.2
Label operation: Push 301888
Composite next hop: 0xd012000 755 INH Session ID: 0x143
Indirect next hop: 0xb69a9a0 1048641 INH Session ID: 0x143
  Next hop type: Router, Next hop index: 716
  Address: 0xd00e710
  Next-hop reference count: 23
  Next hop: 100.46.1.2 via ge-0/0/5.0
  Label-switched-path pe4_to_pe2
  Label operation: Push 300304
  Label TTL action: prop-ttl
  Load balance label: Label 300304: None;
  Label element ptr: 0xd00e760
  Label parent element ptr: 0x0
  Label element references: 15
  Label element child references: 13
  Label element lsp id: 6
Next hop: ELNH Address 0xd0121f0, selected
  Next hop type: Indirect, Next hop index: 0
  Address: 0xd0121f0
  Next-hop reference count: 3
  Protocol next hop: 100.100.100.3
  Label operation: Push 301984
  Composite next hop: 0xd012180 756 INH Session ID: 0x145
  Indirect next hop: 0xb69aab0 1048642 INH Session ID: 0x145
    Next hop type: Router, Next hop index: 801
    Address: 0xd010ed0
    Next-hop reference count: 32
    Next hop: 100.46.1.2 via ge-0/0/5.0
    Label-switched-path pe4_to_pe3
    Label operation: Push 300336
    Label TTL action: prop-ttl
    Load balance label: Label 300336: None;
    Label element ptr: 0xd0108c0
    Label parent element ptr: 0x0
    Label element references: 22
    Label element child references: 20
    Label element lsp id: 7
State: < Active Int >
Age: 2:06:50
Validation State: unverified
Task: evpn global task
Announcement bits (1): 1-KRT
AS path: I

```

show route table mpls.0 protocol evpn

```

user@host>show route table mpls.0 protocol evpn
mpls.0: 121 destinations, 121 routes (121 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

299872          *[EVPN/7] 02:30:58, routing-instance mhevpn, route-type
Ingress-IM, vlan-id 10
                  to table mhevpn.evpn-mac.0
300016          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 110
                  to table VS-1.evpn-mac.0
300032          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 120
                  to table VS-1.evpn-mac.0

```

```

300048          *[EVPN/7] 02:30:38, routing-instance VS-1, route-type
Ingress-IM, vlan-id 130
                to table VS-1.evpn-mac.0
300064          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 210
                to table VS-2.evpn-mac.0
300080          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 220
                to table VS-2.evpn-mac.0
300096          *[EVPN/7] 02:30:38, routing-instance VS-2, route-type
Ingress-IM, vlan-id 230
                to table VS-2.evpn-mac.0
300112          *[EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300128          *[EVPN/7] 02:29:22, routing-instance mhevpn, route-type
Ingress-Aliasing
                to table mhevpn.evpn-mac.0
300144          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300160          *[EVPN/7] 02:29:22, routing-instance VS-1, route-type
Ingress-Aliasing
                to table VS-1.evpn-mac.0
300176          *[EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:44:44:44:44:44:44:44:44
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300192          *[EVPN/7] 02:29:22, routing-instance VS-2, route-type
Ingress-Aliasing
                to table VS-2.evpn-mac.0
300208          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300224          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300240          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300256          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300272          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300288          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300304          *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300320          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11:11
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
                > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300336          *[EVPN/7] 02:27:06, routing-instance VS-1, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33:33
                to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

```

```

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300368 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300384 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300416 * [EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:33:33:33:33:33:33:33
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300432 * [EVPN/7] 02:27:06, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:11:11:11:11:11:11:11
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
300480 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300496 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300560 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300592 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
300608 * [EVPN/7] 02:29:23
> via ge-0/0/1.1001, Pop
300624 * [EVPN/7] 02:29:23
> via ge-0/0/1.2001, Pop
301232 * [EVPN/7] 02:29:17
> via ge-0/0/1.1002, Pop
301296 * [EVPN/7] 02:29:10
> via ge-0/0/1.1003, Pop
301312 * [EVPN/7] 02:27:06
> via ae10.2003, Pop
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301360 * [EVPN/7] 02:29:01
> via ge-0/0/1.1004, Pop
301408 * [EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
vpws1004, route-type Egress, vlan-id 2004
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301456 * [EVPN/7] 02:27:06
> via ae10.1010, Pop
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301552 * [EVPN/7] 02:27:07, routing-instance VS-1, route-type
Egress-MAC, ESI 00:22:22:22:22:22:22:22
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301568 * [EVPN/7] 02:27:07, routing-instance VS-2, route-type

```

```

Egress-MAC, ESI 00:22:22:22:22:22:22:22:22
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301648    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
vpws1010, route-type Egress, vlan-id 2010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301664    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301680    *[EVPN/7] 02:27:07, remote-pe 100.100.100.2, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
301696    *[EVPN/7] 02:27:07, routing-instance mhevpn, route-type
Egress-MAC, ESI 00:22:22:22:22:22:22:22:22
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301712    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301728    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301744    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301760    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
vpws1010, route-type Egress, vlan-id 2010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301776    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301792    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301808    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
vpws1004, route-type Egress, vlan-id 2004
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301824    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301840    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1002, route-type Egress, vlan-id 2002
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301856    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1003, route-type Egress, vlan-id 2003
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301872    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1003, route-type Egress Protection, vlan-id 2003
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301888    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
vpws1010, route-type Egress Protection, vlan-id 1010
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301904    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301920    *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
301936    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 230
    > to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301952    *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 230

```

```

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301968      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 220
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
301984      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 220
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302000      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-IM, vlan-id 210
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302016      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-SH, vlan-id 210
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302032      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302048      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302064      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302080      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-2, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302096      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302112      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302128      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302144      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302160      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302176      *[EVPN/7] 02:27:07, remote-pe 100.100.100.1, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302192      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 130
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302208      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 130
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302224      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302240      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 120
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302256      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-IM, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302272      *[EVPN/7] 02:27:07, remote-pe 100.100.100.3, routing-instance
VS-1, route-type Egress-SH, vlan-id 110
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3

```

```
302288          *[EVPN/7] 02:27:06, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302304          *[EVPN/7] 02:27:06, remote-pe 100.100.100.1, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302320          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302336          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-MAC
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302352          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
vpws1004, route-type Egress, vlan-id 2004
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302368          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-IM, vlan-id 10
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302384          *[EVPN/7] 02:27:06, remote-pe 100.100.100.3, routing-instance
mhevpn, route-type Egress-SH, vlan-id 10
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302400          *[EVPN/7] 02:26:21
> via ge-0/0/1.3001, Pop
302432          *[EVPN/7] 02:26:21, remote-pe 100.100.100.3, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302448          *[EVPN/7] 02:26:21, remote-pe 100.100.100.1, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302464          *[EVPN/7] 02:26:20, remote-pe 100.100.100.2, routing-instance
vpws3001, route-type Egress, vlan-id 40000
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302480          *[EVPN/7] 02:26:14
> via ge-0/0/1.3016, Pop
302512          *[EVPN/7] 02:26:14, remote-pe 100.100.100.1, routing-instance
vpws3016, route-type Egress, vlan-id 40016
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302528          *[EVPN/7] 02:26:14, remote-pe 100.100.100.2, routing-instance
vpws3016, route-type Egress, vlan-id 40016
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302560          *[EVPN/7] 02:26:06
> via ae10.3011, Pop
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302592          *[EVPN/7] 02:26:07, remote-pe 100.100.100.1, routing-instance
vpws3011, route-type Egress, vlan-id 401100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
302608          *[EVPN/7] 02:26:07, remote-pe 100.100.100.2, routing-instance
vpws3011, route-type Egress, vlan-id 401100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302624          *[EVPN/7] 02:26:07, remote-pe 100.100.100.3, routing-instance
vpws3011, route-type Egress Protection, vlan-id 301100
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302656          *[EVPN/7] 02:25:59
> via ae10.3006, Pop
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302688          *[EVPN/7] 02:26:00, remote-pe 100.100.100.2, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2
302704          *[EVPN/7] 02:26:00, remote-pe 100.100.100.1, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
```



```

302720          *[EVPN/7] 02:25:59, remote-pe 100.100.100.3, routing-instance
vpws3006, route-type Egress, vlan-id 400600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
302736          *[EVPN/7] 02:25:59, remote-pe 100.100.100.3, routing-instance
vpws3006, route-type Egress Protection, vlan-id 300600
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ge-0/0/1.1001    *[EVPN/7] 02:29:23
> via ge-0/0/1.2001
ge-0/0/1.2001    *[EVPN/7] 02:29:23
> via ge-0/0/1.1001
ge-0/0/1.1002    *[EVPN/7] 02:27:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ae10.2003        *[EVPN/7] 02:29:10
> via ge-0/0/1.1003
ge-0/0/1.1003    *[EVPN/7] 02:27:06
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3

> via ae10.2003
ge-0/0/1.1004    *[EVPN/7] 02:27:06
to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ae10.1010        *[EVPN/7] 02:27:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ge-0/0/1.3001    *[EVPN/7] 02:26:20
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3
ge-0/0/1.3016    *[EVPN/7] 02:26:13
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ae10.3011        *[EVPN/7] 02:26:06
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1
ae10.3006        *[EVPN/7] 02:25:59
> to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe1

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe2

to 100.46.1.2 via ge-0/0/5.0, label-switched-path pe4_to_pe3

```

show route table mpls.0 protocol ospf

```

user@host> show route table mpls.0 protocol ospf
mpls.0: 29 destinations, 29 routes (29 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

299952          *[L-OSPF/10] 23:59:42, metric 0
> to 10.0.10.70 via lt-1/2/0.14, Pop
to 10.0.6.60 via lt-1/2/0.12, Swap 800070, Push 800030(top)
299952(S=0)     *[L-OSPF/10] 23:59:42, metric 0
> to 10.0.10.70 via lt-1/2/0.14, Pop
to 10.0.6.60 via lt-1/2/0.12, Swap 800070, Push 800030(top)
299968          *[L-OSPF/10] 23:59:48, metric 0
> to 10.0.6.60 via lt-1/2/0.12, Pop

```

show route table mpls.0 extensive (PTX Series)

```

user@host> show route table mpls.0 extensive
ge-0/0/2.600 (1 entry, 1 announced)
TSI:
KRT in-kernel ge-0/0/2.600.0      /32 -> {composite(570)}
  *L2VPN Preference: 7
    Next hop type: Indirect
    Address: 0x9438f34
    Next-hop reference count: 2
    Next hop type: Router, Next hop index: 567
    Next hop: 10.0.0.1 via ge-0/0/1.0, selected
    Label operation: Push 299808
    Label TTL action: prop-ttl
    Load balance label: Label 299808:None;
    Session Id: 0x1
    Protocol next hop: 10.255.255.1
    Label operation: Push 299872 Offset: 252
    Label TTL action: no-prop-ttl
    Load balance label: Label 299872:Flow label PUSH;
    Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
    Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
    State: <Active Int>
    Age: 47      Metric2: 1
    Validation State: unverified
    Task: Common L2 VC
    Announcement bits (2): 0-KRT 2-Common L2 VC
    AS path: I
    Composite next hops: 1
      Protocol next hop: 10.255.255.1 Metric: 1
      Label operation: Push 299872 Offset: 252
      Label TTL action: no-prop-ttl
      Load balance label: Label 299872:Flow label PUSH;
      Composite next hop: 0x9438ed8 570 INH Session ID: 0x2
      Indirect next hop: 0x9448208 262142 INH Session ID: 0x2
      Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.0.0.1 via ge-0/0/1.0
        Session Id: 0x1
      10.255.255.1/32 Originating RIB: inet.3
        Metric: 1      Node path count: 1
        Forwarding nexthops: 1
        Nexthop: 10.0.0.1 via ge-0/0/1.0

```

show route table mpls.0 (RSVP Route—Transit LSP)

```

user@host> show route table mpls.0

mpls.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0          * [MPLS/0] 00:37:31, metric 1
            Receive
1          * [MPLS/0] 00:37:31, metric 1
            Receive
2          * [MPLS/0] 00:37:31, metric 1
            Receive
13         * [MPLS/0] 00:37:31, metric 1
            Receive
300352     * [RSVP/7/1] 00:08:00, metric 1

```

```

300352(S=0)      > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
                  *[RSVP/7/1] 00:08:00, metric 1
300384           > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
                  *[RSVP/7/2] 00:05:20, metric 1
                  > to 10.64.1.106 via ge-1/0/0.0, Pop
300384(S=0)      *[RSVP/7/2] 00:05:20, metric 1
                  > to 10.64.1.106 via ge-1/0/0.0, Pop

```

show route table vpls_1 detail

```

user@host> show route table vpls_1 detail
vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

172.16.1.11:1000:1:1/96 (1 entry, 1 announced)
*L2VPN Preference: 170/-1
Receive table: vpls_1.l2vpn.0
Next-hop reference count: 2
State: <Active Int Ext>
Age: 4:29:47 Metric2: 1
Task: vpls_1-l2vpn
Announcement bits (1): 1-BGP.0.0.0+179
AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down
Label-base: 800000, range: 8, status-vector: 0xFF

```

show route table vpn-a

```

user@host> show route table vpn-a
vpn-a.l2vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

+ = Active Route, - = Last Active, * = Both
192.168.16.1:1:1/96
    *[VPN/7] 05:48:27
        Discard
192.168.24.1:1:2:1/96
    *[BGP/170] 00:02:53, localpref 100, from 192.168.24.1
        AS path: I
        > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am
192.168.24.1:1:3:1/96
    *[BGP/170] 00:02:53, localpref 100, from 192.168.24.1
        AS path: I
        > to 10.0.16.2 via fe-0/0/1.0, label-switched-path am

```

show route table vpn-a.mdt.0

```

user@host> show route table vpn-a.mdt.0
vpn-a.mdt.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:1:0:10.255.14.216:232.1.1.1/144
    *[MVPN/70] 01:23:05, metric2 1
        Indirect
1:1:1:10.255.14.218:232.1.1.1/144
    *[BGP/170] 00:57:49, localpref 100, from 10.255.14.218
        AS path: I
        > via so-0/0/0.0, label-switched-path r0e-to-r1
1:1:2:10.255.14.217:232.1.1.1/144
    *[BGP/170] 00:57:49, localpref 100, from 10.255.14.217

```

```

AS path: I
> via so-0/0/1.0, label-switched-path r0-to-r2

```

show route table VPN-A detail

```

user@host> show route table VPN-A detail
VPN-AB.inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
10.255.179.9/32 (1 entry, 1 announced)
    *BGP      Preference: 170/-101
                Route Distinguisher: 10.255.179.13:200
                Next hop type: Indirect
                Next-hop reference count: 5
                Source: 10.255.179.13
                Next hop type: Router, Next hop index: 732
                Next hop: 10.39.1.14 via fe-0/3/0.0, selected
                Label operation: Push 299824, Push 299824(top)
                Protocol next hop: 10.255.179.13
                Push 299824
                Indirect next hop: 8f275a0 1048574
                State: (Secondary Active Int Ext)
                Local AS: 1 Peer AS: 1
                Age: 3:41:06 Metric: 1 Metric2: 1
                Task: BGP_1.10.255.179.13+64309
                Announcement bits (2): 0-KRT 1-BGP RT Background
                AS path: I
                Communities: target:1:200 rte-type:0.0.0.0:1:0
                Import Accepted
                VPN Label: 299824 TTL Action: vrf-ttl-propagate
                Localpref: 100
                Router ID: 10.255.179.13
                Primary Routing Table bgp.13vpn.0

```

show route table VPN-AB.inet.0

```

user@host> show route table VPN-AB.inet.0
VPN-AB.inet.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.39.1.0/30      *[OSPF/10] 00:07:24, metric 1
> via so-7/3/1.0
10.39.1.4/30      *[Direct/0] 00:08:42
> via so-5/1/0.0
10.39.1.6/32      *[Local/0] 00:08:46
Local
10.255.71.16/32   *[Static/5] 00:07:24
> via so-2/0/0.0
10.255.71.17/32   *[BGP/170] 00:07:24, MED 1, localpref 100, from
10.255.71.15
AS path: I
> via so-2/1/0.0, Push 100020, Push 100011(top)
10.255.71.18/32   *[BGP/170] 00:07:24, MED 1, localpref 100, from
10.255.71.15
AS path: I
> via so-2/1/0.0, Push 100021, Push 100011(top)
10.255.245.245/32 *[BGP/170] 00:08:35, localpref 100
AS path: 2 I
> to 10.39.1.5 via so-5/1/0.0
10.255.245.246/32 *[OSPF/10] 00:07:24, metric 1
> via so-7/3/1.0

```

show route table VPN_blue.mvpn-inet6.0

```

user@host> show route table VPN_blue.mvpn-inet6.0
vpn_blue.mvpn-inet6.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:10.255.2.202:65536:10.255.2.202/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.202
    AS path: I
    > via so-0/1/3.0
1:10.255.2.203:65536:10.255.2.203/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.203
    AS path: I
    > via so-0/1/0.0
1:10.255.2.204:65536:10.255.2.204/432
    *[MVPN/70] 00:57:23, metric2 1
    Indirect
5:10.255.2.202:65536:128::192.168.90.2:128:ffff::1/432
    *[BGP/170] 00:02:37, localpref 100, from 10.255.2.202
    AS path: I
    > via so-0/1/3.0
6:10.255.2.203:65536:64500:128::10.12.53.12:128:ffff::1/432
    *[PIM/105] 00:02:37
    Multicast (IPv6)
7:10.255.2.202:65536:64500:128::192.168.90.2:128:ffff::1/432
    *[MVPN/70] 00:02:37, metric2 1
    Indirect

```

show route table vrf1.mvpn.0 extensive

```

user@host> show route table vrf1.mvpn.0 extensive
1:10.255.50.77:1:10.255.50.77/240 (1 entry, 1 announced)
    *MVPN Preference: 70
    PMSI: Flags 0x0: Label 0: RSVP-TE:
Session_13[10.255.50.77:0:25624:10.255.50.77]
    Next hop type: Indirect
    Address: 0xbb2c944
    Next-hop reference count: 360
    Protocol next hop: 10.255.50.77
    Indirect next hop: 0x0 - INH Session ID: 0x0
    State: <Active Int Ext>
    Age: 53:03 Metric2: 1
    Validation State: unverified
    Task: mvpn global task
    Announcement bits (3): 0-PIM.vrf1 1-mvpn global task 2-rt-export

    AS path: I

```

show route table inetflow detail

```

user@host> show route table inetflow detail
inetflow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
10.12.44.1,*/48 (1 entry, 1 announced)
    *BGP Preference: 170/-101
    Next-hop reference count: 2
    State: <Active Ext>
    Local AS: 64502 Peer AS: 64500
    Age: 4
    Task: BGP_64500.10.12.99.5+3792
    Announcement bits (1): 0-Flow

```

```

AS path: 64500 I
Communities: traffic-rate:0:0
Validation state: Accept, Originator: 10.12.99.5
Via: 10.12.44.0/24, Active
Localpref: 100
Router ID: 10.255.71.161

10.12.56.1,*/48 (1 entry, 1 announced)
*Flow Preference: 5
Next-hop reference count: 2
State: <Active>
Local AS: 64502
Age: 6:30
Task: RT Flow
Announcement bits (2): 0-Flow 1-BGP.0.0.0+179
AS path: I
Communities: 1:1

user@host> show route table green.l2vpn.0 (VPLS Multihoming with FEC 129)
green.l2vpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

10.1.1.2:100:10.1.1.2/96 AD
    *[VPLS/170] 1d 03:11:03, metric2 1
    Indirect
10.1.1.4:100:10.1.1.4/96 AD
    *[BGP/170] 1d 03:11:02, localpref 100, from 10.1.1.4
    AS path: I, validation-state: unverified
    > via ge-1/2/1.5
10.1.1.2:100:1:0/96 MH
    *[VPLS/170] 1d 03:11:03, metric2 1
    Indirect
10.1.1.4:100:1:0/96 MH
    *[BGP/170] 1d 03:11:02, localpref 100, from 10.1.1.4
    AS path: I, validation-state: unverified
    > via ge-1/2/1.5
10.1.1.4:NoCtrlWord:5:100:100:10.1.1.2:10.1.1.4/176
    *[VPLS/7] 1d 03:11:02, metric2 1
    > via ge-1/2/1.5
10.1.1.4:NoCtrlWord:5:100:100:10.1.1.4:10.1.1.2/176
    *[LDP/9] 1d 03:11:02
    Discard

user@host> show route table red extensive
red.inet.0: 364481 destinations, 714087 routes (364480 active, 48448 holddown, 1
hidden)
10.0.0.0/32 (3 entries, 1 announced)
    State: <OnList CalcForwarding>
TSI:
KRT in-kernel 10.0.0.0/32 -> {composite(1048575)} Page 0 idx 1 Type 1 val 0x934342c

    Nexthop: Self
    AS path: [2] I
    Communities: target:2:1
Path 10.0.0.0 from 10.3.0.0 Vector len 4. Val: 1
    @BGP Preference: 170/-1
    Route Distinguisher: 2:1
    Next hop type: Indirect
    Address: 0x258059e4
    Next-hop reference count: 2

```

```

Source: 2.2.0.0
Next hop type: Router
Next hop: 10.1.1.1 via ge-1/1/9.0, selected
Label operation: Push 707633
Label TTL action: prop-ttl
Session Id: 0x17d8
Protocol next hop: 10.2.0.0
Push 16
Composite next hop: 0x25805988 - INH Session ID: 0x193c
Indirect next hop: 0x23eea900 - INH Session ID: 0x193c
State: <Secondary Active Int Ext ProtectionPath ProtectionCand>
Local AS:      2 Peer AS:      2
Age: 23        Metric2: 35
Validation State: unverified
Task: BGP_172.16.2.0.0+34549
AS path: I
Communities: target:2:1
Import Accepted
VPN Label: 16
Localpref: 0
Router ID: 10.2.0.0
Primary Routing Table bgp.13vpn.0
Composite next hops: 1
  Protocol next hop: 10.2.0.0 Metric: 35
  Push 16
  Composite next hop: 0x25805988 - INH Session ID: 0x193c
  Indirect next hop: 0x23eea900 - INH Session ID: 0x193c
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.1.1.1 via ge-1/1/9.0
    Session Id: 0x17d8
  2.2.0.0/32 Originating RIB: inet.3
    Metric: 35                      Node path count: 1
    Forwarding nexthops: 1
      Nexthop: 10.1.1.1 via ge-1/1/9.0
BGP Preference: 170/-1
Route Distinguisher: 2:1
Next hop type: Indirect
Address: 0x9347028
Next-hop reference count: 3
Source: 10.3.0.0
Next hop type: Router, Next hop index: 702
Next hop: 10.1.4.2 via ge-1/0/0.0, selected
Label operation: Push 634278
Label TTL action: prop-ttl
Session Id: 0x17d9
Protocol next hop: 10.3.0.0
Push 16
Composite next hop: 0x93463a0 1048575 INH Session ID: 0x17da
Indirect next hop: 0x91e8800 1048574 INH Session ID: 0x17da
State: <Secondary NotBest Int Ext ProtectionPath ProtectionCand>

Inactive reason: Not Best in its group - IGP metric
Local AS:      2 Peer AS:      2
Age: 3:34      Metric2: 70
Validation State: unverified
Task: BGP_172.16.3.0.0+32805
Announcement bits (2): 0-KRT 1-BGP_RT_Background
AS path: I
Communities: target:2:1
Import Accepted

```

```

VPN Label: 16
Localpref: 0
Router ID: 10.3.0.0
Primary Routing Table bgp.13vpn.0
Composite next hops: 1
    Protocol next hop: 10.3.0.0 Metric: 70
    Push 16
    Composite next hop: 0x93463a0 1048575 INH Session ID:
0x17da
    Indirect next hop: 0x91e8800 1048574 INH Session ID:
0x17da
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.1.4.2 via ge-1/0/0.0
        Session Id: 0x17d9
    10.3.0.0/32 Originating RIB: inet.3
        Metric: 70
        Node path count: 1
        Forwarding nexthops: 1
            Nexthop: 10.1.4.2 via ge-1/0/0.0
#Multipath Preference: 255
    Next hop type: Indirect
    Address: 0x24afca30
    Next-hop reference count: 1
    Next hop type: Router
    Next hop: 10.1.1.1 via ge-1/1/9.0, selected
    Label operation: Push 707633
    Label TTL action: prop-ttl
    Session Id: 0x17d8
    Next hop type: Router, Next hop index: 702
    Next hop: 10.1.4.2 via ge-1/0/0.0
    Label operation: Push 634278
    Label TTL action: prop-ttl
    Session Id: 0x17d9
    Protocol next hop: 10.2.0.0
    Push 16
    Composite next hop: 0x25805988 - INH Session ID: 0x193c
    Indirect next hop: 0x23eea900 - INH Session ID: 0x193c Weight 0x1

    Protocol next hop: 10.3.0.0
    Push 16
    Composite next hop: 0x93463a0 1048575 INH Session ID: 0x17da
    Indirect next hop: 0x91e8800 1048574 INH Session ID: 0x17da Weight
0x4000
    State: <ForwardingOnly Int Ext>
    Inactive reason: Forwarding use only
    Age: 23
    Metric2: 35
    Validation State: unverified
    Task: RT
    AS path: I
    Communities: target:2:1

```

show route table bgp.evpn.0 extensive [no-more (EVPN)]

```

show route table bgp.evpn.0 extensive | no-more
bgp.evpn.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
2:1000:10::100::00:aa:aa:aa:aa:aa/304 (1 entry, 0 announced)
    *BGP
        Preference: 170/-101
        Route Distinguisher: 1000:10
        Next hop type: Indirect
        Address: 0x9420fd0
        Next-hop reference count: 12

```



```

Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS:17 Age:21:12 Metric2:1 Validation State:
unverified
Task: BGP_17.1.2.3.4+50756
AS path: I
Communities: target:1111:8388708 encapsulation0:0:0:0:3
Import Accepted
Route Label: 100
ESI: 00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  1.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

2:1000:10::200::00:bb:bb:bb:bb:bb/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:19:43 Metric2:1 Validation
State:unverified
Task: BGP_17.1.2.3.4+50756
AS path: I
Communities: target:2222:22 encapsulation0:0:0:0:3
Import Accepted
Route Label: 200
ESI: 00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

2:1000:10::300::00:cc:cc:cc:cc:cc/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10

```

```

Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:17:21 Metric2:1 Validation State:
unverified Task: BGP 17,1,2,3,4+50756
AS path: I
Communities: target:3333:33 encapsulation0:0:0:0:3
Import Accepted
Route Label: 300
ESI: 00:00:00:00:00:00:00:00:00:00:00:00
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

3:1000:10::100::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
PMSI: Flags 0x0: Label 100: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS:17 Peer AS:17 Age:37:01 Metric2:1 Validation State:
unverified Task: BGP 17.1.2.3.4+50756
AS path: I
Communities: target:1111:8388708 encapsulation0:0:0:0:3
Import Accepted
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
  Protocol next hop: 10.2.3.4 Metric: 1
  Indirect next hop: 0x2 no-forward INH Session ID: 0x0
  Indirect path forwarding next hops: 1
    Next hop type: Router
    Next hop: 10.10.10.1 via xe-0/0/1.0
    Session Id: 0x2
  10.2.3.4/32 Originating RIB: inet.0
    Metric: 1 Node path count: 1
    Forwarding nexthops: 2
    Nexthop: 10.92.78.102 via em0.0

3:1000:10::200::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10

```

```

PMSI: Flags 0x0: Label 200: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS: 17 Age:35:22 Metric2:1 Validation
State:unverified Task: BGP 17.1.2.3.4+50756
AS path:I Communities: target:2222:22 encapsulation):0:0:0:0:3

Import Accepted
Localpref: 100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
    Protocol next hop: 10.2.3.4 Metric: 1
    Indirect next hop: 0x2 no-forward INH Session ID: 0x0
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.10.10.1 via xe-0/0/1.0
        Session Id: 0x2
    10.2.3.4/32 Originating RIB: inet.0
        Metric: 1 Node path count: 1
        Forwarding nexthops: 2
        Nexthop: 10.92.78.102 via em0.0

3:1000:10::300::1.2.3.4/304 (1 entry, 0 announced)
*BGP Preference: 170/-101
Route Distinguisher: 1000:10
PMSI: Flags 0x0: Label 300: Type INGRESS-REPLICATION 1.2.3.4
Next hop type: Indirect
Address: 0x9420fd0
Next-hop reference count: 12
Source: 10.2.3.4
Protocol next hop: 10.2.3.4
Indirect next hop: 0x2 no-forward INH Session ID: 0x0
State: Local AS: 17 Peer AS: 17 Age 35:22 Metric2:1 Validation State:
unverified Task: BGP 17.1.2.3.4+5075
6 AS path: I Communities: target:3333:33 encapsulation0:0:0:0:3
Import Accepted Localpref:100
Router ID: 10.2.3.4
Secondary Tables: default-switch.evpn.0
Indirect next hops: 1
    Protocol next hop: 10.2.3.4 Metric: 1
    Indirect next hop: 0x2 no-forward INH Session ID: 0x0
    Indirect path forwarding next hops: 1
        Next hop type: Router
        Next hop: 10.10.10.1 via xe-0/0/1.0
        Session Id: 0x2
    10.2.3.4/32 Originating RIB: inet.0
        Metric: 1 Node path count: 1
        Forwarding nexthops: 2
        Nexthop: 10.92.78.102 via em0.0

```

show route terse

List of Syntax [Syntax on page 680](#)
[Syntax \(EX Series Switches\) on page 680](#)

Syntax show route terse
 <logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches) show route terse

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Display a high-level summary of the routes in the routing table.



NOTE: For BGP routes, the **show route terse** command displays the local preference attribute and MED instead of the metric1 and metric2 values. This is mostly due to historical reasons.

To display the metric1 and metric2 value of a BGP route, use the [show route extensive](#) command.

Options **none**—Display a high-level summary of the routes in the routing table.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level view

List of Sample Output [show route terse on page 682](#)

Output Fields [Table 32 on page 461](#) describes the output fields for the **show route terse** command. Output fields are listed in the approximate order in which they appear.

Table 53: show route terse Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 53: show route terse Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	Number of routes in the routing table and total number of routes in the following states: <ul style="list-style-type: none"> • active (routes that are active) • holddown (routes that are in the pending state before being declared inactive) • hidden (routes that are not used because of a routing policy)
<i>route key</i>	Key for the state of the route: <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • -—A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route.
A	Active route. An asterisk (*) indicates this is the active route.
V	Validation status of the route: <ul style="list-style-type: none"> • ?—Not evaluated. Indicates that the route was not learned through BGP. • I—Invalid. Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • N—Unknown. Indicates that the prefix is not among the prefixes or prefix ranges in the database. • V—Valid. Indicates that the prefix and autonomous system pair are found in the database.
Destination	Destination of the route.
P	Protocol through which the route was learned: <ul style="list-style-type: none"> • A—Aggregate • B—BGP • C—CCC • D—Direct • G—GMPLS • I—IS-IS • L—L2CKT, L2VPN, LDP, Local • K—Kernel • M—MPLS, MSDP • O—OSPF • P—PIM • R—RIP, RIPvng • S—Static • T—Tunnel
Prf	Preference value of the route. In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.

Table 53: show route terse Output Fields (*continued*)

Field Name	Field Description
Metric 1	First metric value in the route. For routes learned from BGP, this is the MED metric.
Metric 2	Second metric value in the route. For routes learned from BGP, this is the IGP metric.
Next hop	Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> I—IGP. E—EGP. ?—Incomplete; typically, the AS path was aggregated.

Sample Output

show route terse

```

user@host> show route terse
inet.0: 10 destinations, 12 routes (10 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A V Destination      P Prf  Metric 1  Metric 2  Next hop      AS path
* ? 172.16.1.1/32      0 10          1          >10.0.0.2      I
?                               B 170        100          >10.0.0.2
  unverified                               >10.0.0.2
* ? 172.16.1.1/32      D 0          110        >10.0.2        200 I
* V 2.2.0.2/32         B 170        110        >10.0.0.2
  valid                               >10.0.0.2
* ? 10.0.0.0/30        D 0          100        >1t-1/2/0.1    I
?                               B 170        100        >10.0.0.2
  unverified                               >10.0.0.2
* ? 10.0.0.1/32        L 0          100        Local          I
* ? 10.0.0.4/30        B 170        100        >10.0.0.2
  unverified                               >10.0.0.2
* ? 10.0.0.8/30        B 170        100        >10.0.0.2      I
  unverified                               >10.0.0.2
* I 172.16.1.1/32      B 170        90          >10.0.0.2      200 I
  invalid                               >10.0.0.2
* N 192.168.2.3/32     B 170        100        >10.0.0.2      200 I
  unknown                               >10.0.0.2
* ? 172.16.233.5/32    0 10          1          MultiRecv

```

test policy

Syntax `test policy policy-name prefix`

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Test a policy configuration to determine which prefixes match routes in the routing table.



NOTE: If you are using the `test policy` command on a logical system, you must first set the CLI to the logical system context. For example, if you want to test a routing policy that is configured on logical system R2, first run the `set cli logical-system R2` command.

Options *policy-name*—Name of a policy.
prefix—Destination prefix to match.

Additional Information All prefixes in the default unicast routing table (inet.0) that match prefixes that are the same as or longer than the specific prefix are processed by the **from** clause in the specified policy. All prefixes accepted by the policy are displayed. The **test policy** command evaluates a policy differently from the BGP import process. When testing a policy that contains an **interface** match condition in the **from** clause, the **test policy** command uses the match condition. In contrast, BGP does not use the **interface** match condition when evaluating the policy against routes learned from internal BGP (IBGP) or external BGP (EGBP) multihop peers.

When testing a policy, you can see the length of time (in microseconds) required to evaluate the policy and the number of times it has been executed by running the `show policy policy-name statistics` command.

Required Privilege Level view

Related Documentation

- [Understanding Routing Policy Tests](#)
- [Example: Testing a Routing Policy with Complex Regular Expressions on page 137](#)
- [show policy on page 262](#)

List of Sample Output [test policy on page 684](#)

Output Fields For information about output fields, see the output field tables for the [show route](#) command, the [show route detail](#) command, the [show route extensive](#) command, or the [show route terse](#) command.

Sample Output

test policy

```
user@host> test policy test-statics 172.16.0.1/8
inet.0: 44 destinations, 44 routes (44 active, 0 holddown, 0 hidden)
Prefixes passing policy:

172.16.3.0/8          *[BGP/170] 16:22:46, localpref 100, from 10.255.255.41
                    AS Path: 50888 I
                    > to 10.11.4.32 via en0.2, label-switched-path l2
172.16.3.1/32        *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                    > to 10.0.4.7 via fxp0.0
172.16.3.2/32        *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                    > to 10.0.4.7 via fxp0.0
172.16.3.3/32        *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                    > to 10.0.4.7 via fxp0.0
172.16.3.4/32        *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
                    > to 10.0.4.7 via fxp0.0
Policy test-statics: 5 prefixes accepted, 0 prefixes rejected
```