



Junos[®] OS

RIP Feature Guide



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Junos[®] OS RIP Feature Guide

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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 <http://www.juniper.net/techpubs/>.

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 <http://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](#)

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 xiv](#) 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 xiv 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 .

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- 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 <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://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.

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

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

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 <http://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 <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

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

CHAPTER 1

Introduction to RIP

- [RIP Overview on page 3](#)
- [RIP Configuration Overview on page 8](#)
- [Supported RIP and RIPng Standards on page 9](#)
- [Routing Protocol Process Overview on page 9](#)

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.

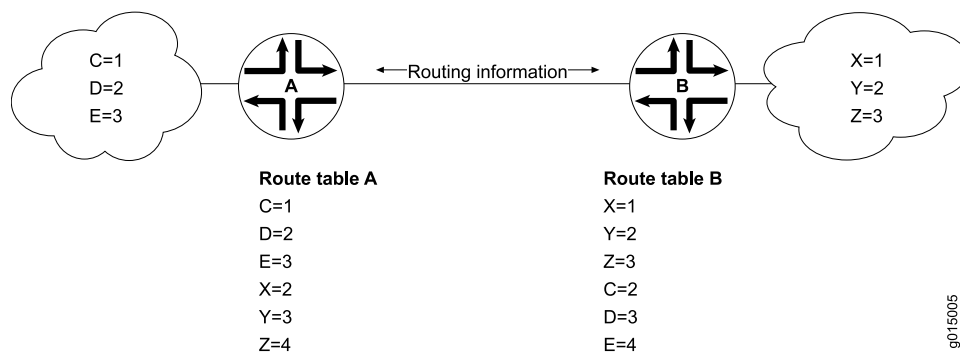
This topic contains the following sections:

- [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 36](#).

- 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*.

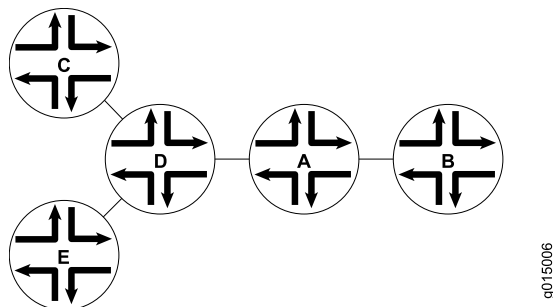
Split Horizon and Poison Reverse Efficiency Techniques

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



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.



Sectional 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 8](#)
 - *Example: Configuring RIP*

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 13](#).
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 60](#) and [“Example: Controlling Traffic in a RIP Network with an Outgoing Metric” on page 62](#).
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 22](#) and [“Enabling Authentication with MD5 Authentication \(CLI Procedure\)” on page 22](#).

- 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 121](#)

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

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*

PART 2

Configuring RIP

- [Configuring a Basic RIP Network on page 13](#)
- [Configuring Authentication for RIP Routes on page 21](#)
- [Configuring RIP Timers and Demand Circuits on page 29](#)
- [Configuring BFD for RIP on page 43](#)
- [Using Metrics to Control Traffic in a RIP Network on page 59](#)
- [Configuring Point-to-Multipoint RIP Networks on page 69](#)
- [Configuring RIP Import Policy on page 77](#)
- [Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 83](#)
- [Redistributing Routes Between Two RIP Instances on page 89](#)
- [Tracing RIP Protocol Traffic on page 97](#)

CHAPTER 2

Configuring a Basic RIP Network

- [Understanding Basic RIP Routing on page 13](#)
- [Example: Configuring a Basic RIP Network on page 13](#)

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 13](#)

Example: Configuring a Basic RIP Network

This example shows how to configure a basic RIP network.

- [Requirements on page 13](#)
- [Overview on page 13](#)
- [Configuration on page 14](#)
- [Verification on page 16](#)

Requirements

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

Overview

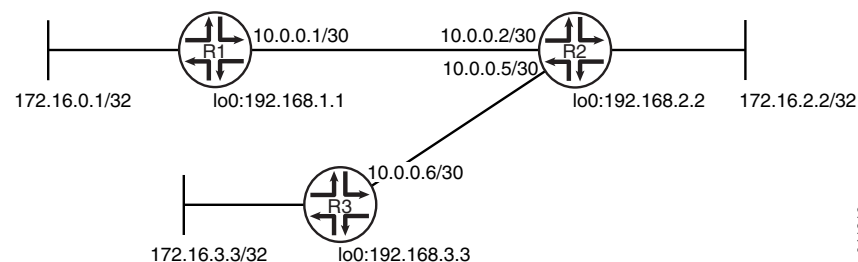
In this example, you configure a basic RIP network, create a RIP group called **rip-group**, and add the directly connected interfaces to the RIP group. Then you configure a routing policy to advertise direct routes using policy statement **advertise-routes-through-rip**.

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 14](#) shows the topology used in this example.

Figure 5: Sample RIP Network Topology



“CLI Quick Configuration” on [page 14](#) shows the configuration for all of the devices in [Figure 5 on page 14](#). The section “Step-by-Step Procedure” on [page 15](#) 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	<pre> 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 </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 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 </pre>

- 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 16](#)
- [Looking at the Routes That Device R1 Is Advertising to Device R2 on page 17](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 17](#)
- [Verifying the RIP-Enabled Interfaces on page 18](#)
- [Verifying the Exchange of RIP Messages on page 18](#)
- [Verifying Reachability of All Hosts in the RIP Network on page 19](#)

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 **traceroute** 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 **traceroute** command.

```
user@R1> traceroute 192.168.3.3
traceroute 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 13](#)
- [RIP Configuration Overview on page 8](#)

Configuring Authentication for RIP Routes

- [Understanding RIP Authentication on page 21](#)
- [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 22](#)
- [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 22](#)
- [Example: Configuring Route Authentication for RIP on page 23](#)

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 22](#)
- [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 22](#)

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 3 on page 22](#).
3. If you are finished configuring the router, commit the configuration.

Table 3: 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 password

- Related Documentation**
- [Understanding RIP Authentication on page 21](#)
 - [RIP Configuration Overview on page 8](#)
 - [Enabling Authentication with Plain-Text Passwords \(CLI Procedure\) on page 22](#)

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 4 on page 22](#).
3. If you are finished configuring the router, commit the configuration.

Table 4: 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

Table 4: Configuring Simple RIP Authentication (*continued*)

Task	CLI Configuration Editor
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 21](#)
 - [RIP Configuration Overview on page 8](#)
 - [Enabling Authentication with MD5 Authentication \(CLI Procedure\) on page 22](#)

Example: Configuring Route Authentication for RIP

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

- [Requirements on page 23](#)
- [Overview on page 23](#)
- [Configuration on page 24](#)
- [Verification on page 27](#)

Requirements

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

Overview

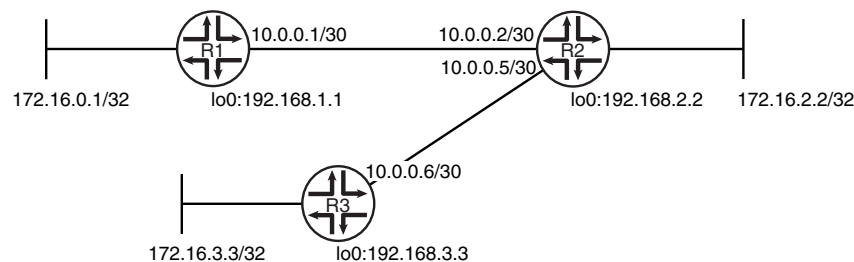
You can configure the router to authenticate RIP route queries. By default, authentication is disabled. You can use one of the following authentication methods:

- 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 24](#) shows the topology used in this example.

Figure 6: RIP Authentication Network Topology



"CLI Quick Configuration" on page 24 shows the configuration for all of the devices in Figure 6 on page 24. The section "Step-by-Step Procedure" on page 25 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 27](#)
- [Verifying That MD5 Authentication Is Enabled in RIP Update Packets on page 27](#)

### 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 13](#)

## CHAPTER 4

# Configuring RIP Timers and Demand Circuits

- [Understanding RIP Timers on page 29](#)
- [Example: Configuring RIP Timers on page 30](#)
- [RIP Demand Circuits Overview on page 36](#)
- [Example: Configuring RIP Demand Circuits on page 38](#)

### 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 30](#)
- [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 30](#)
- [Overview on page 30](#)
- [Configuration on page 31](#)
- [Verification on page 33](#)

### 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.

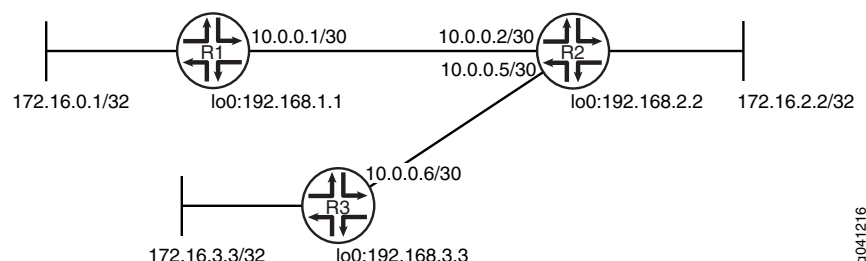
This example is not necessarily practical, but it is shown for demonstration purposes. Generally, we recommend against changing the RIP timers, unless the effects of a change are well understood. Normally, the default values are best left in effect for standard operations.



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

Figure 7 on page 31 shows the topology used in this example.

**Figure 7: RIP Timers Network Topology**



“CLI Quick Configuration” on page 31 shows the configuration for all of the devices in Figure 7 on page 31. The section “Step-by-Step Procedure” on page 32 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 33](#)
- [Checking the RIP Updates Received by Device R2 on page 34](#)
- [Checking the RIP Updates Received by Device R3 on page 35](#)

### 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           |
| <b>RIPv2 Updates Received</b> | <b>181</b> | <b>5</b>   | <b>1</b>    |
| 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           |
| <b>RIPv2 Updates Received</b> | <b>827</b> | <b>31</b>  | <b>6</b>    |
| 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 37](#)
- [Timers Used by RIP Demand Circuits on page 37](#)

## 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 5 on page 37](#) describes the three packet types.

**Table 5: 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 134](#)

## 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 30](#)
- [Example: Configuring RIP Demand Circuits on page 38](#)
- [holddown on page 139](#)
- [max-retrans-time on page 142](#)

---

## Example: Configuring RIP Demand Circuits

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

- [Requirements on page 39](#)
- [Overview on page 39](#)
- [Configuration on page 39](#)
- [Verification on page 41](#)



## 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 36](#)



## CHAPTER 5

# Configuring BFD for RIP

- [Understanding BFD for RIP on page 43](#)
- [Example: Configuring BFD for RIP on page 44](#)
- [Understanding BFD Authentication for RIP on page 49](#)
- [Example: Configuring BFD Authentication for RIP on page 51](#)

### 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 44](#)

## Example: Configuring BFD for RIP

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

- [Requirements on page 44](#)
- [Overview on page 44](#)
- [Configuration on page 46](#)
- [Verification on page 48](#)

## 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.

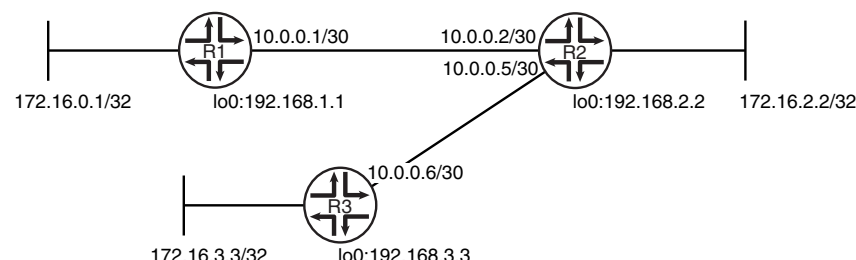
To specify the BFD version used for detection, include the **version** statement. The default is to have the version detected automatically.

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 8 on page 46 shows the topology used in this example.

Figure 8: RIP BFD Network Topology



“CLI Quick Configuration” on page 46 shows the configuration for all of the devices in Figure 8 on page 46. The section “Step-by-Step Procedure” on page 47 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 <b>[edit]</b> 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 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 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 48](#)
- [Checking the BFD Trace File on page 49](#)

### 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 43](#)

## 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 50](#)
- [Security Authentication Keychains on page 50](#)
- [Strict Versus Loose Authentication on page 51](#)

## 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 51](#)
  - [bfd-liveness-detection on page 131](#)
  - **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 44](#)

## Example: Configuring BFD Authentication for RIP

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

- [Requirements on page 51](#)
- [Overview on page 51](#)
- [Configuration on page 52](#)
- [Verification on page 55](#)

## 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.

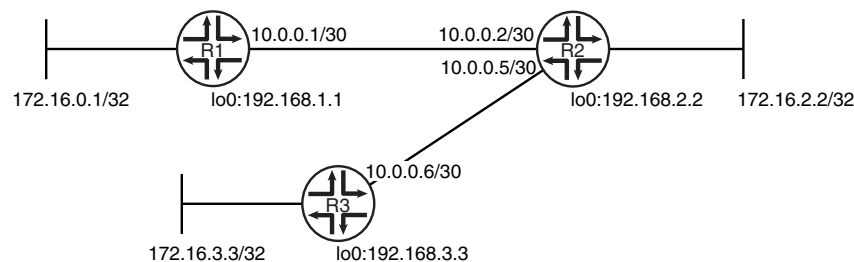
## Overview

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 9 on page 52](#) shows the topology used in this example.

Figure 9: RIP BFD Authentication Network Topology



"CLI Quick Configuration" on page 52 shows the configuration for all of the devices in Figure 9 on page 52. The section "Step-by-Step Procedure" on page 53 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 56](#)
- [Viewing Extensive Information About the BFD Authentication on page 56](#)
- [Checking the BFD Trace File on page 56](#)

### 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 49](#)



## CHAPTER 6

# Using Metrics to Control Traffic in a RIP Network

- [Understanding Traffic Control with Metrics in a RIP Network on page 59](#)
- [Example: Controlling Traffic in a RIP Network with an Incoming Metric on page 60](#)
- [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 62](#)
- [Example: Configuring the Metric Value Added to Imported RIP Routes on page 63](#)

## 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 60](#)
- [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 62](#)

---

## 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 60](#)
- [Overview on page 60](#)
- [Configuration on page 61](#)
- [Verification on page 61](#)

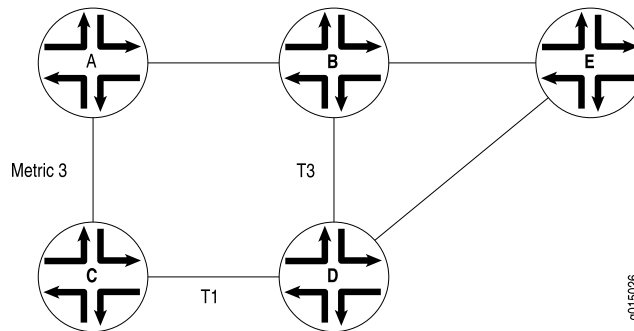
### Requirements

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 13.

### Overview

In this example, routes to Router D are received by Router A across both of its RIP-enabled interfaces as shown in [Figure 10 on page 61](#). 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 10: 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 59](#)

- [RIP Configuration Overview on page 8](#)
- [Example: Controlling Traffic in a RIP Network with an Outgoing Metric on page 62](#)
- [Verifying a RIP Configuration on page 121](#)

## 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 62](#)
- [Overview on page 62](#)
- [Configuration on page 63](#)
- [Verification on page 63](#)

### Requirements

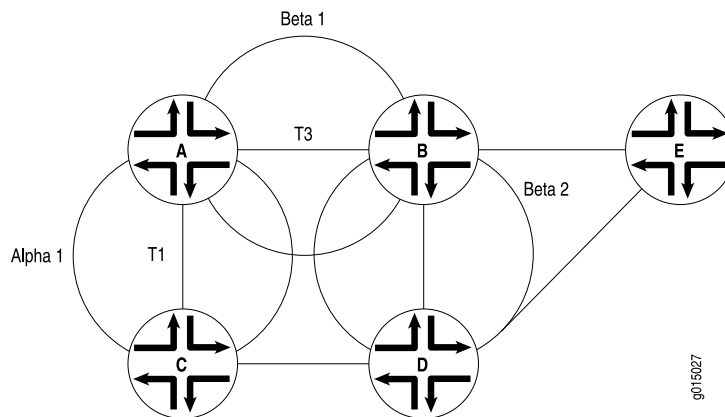
Before you begin:

- 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 13](#).
- Control traffic with an incoming metric. See [“Example: Controlling Traffic in a RIP Network with an Incoming Metric” on page 60](#).

### Overview

In this example, each route from Router A to Router D has two hops as shown in [Figure 11 on page 62](#). 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 11: 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 59](#)
- [RIP Configuration Overview on page 8](#)
- [Verifying a RIP Configuration on page 121](#)

## 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 63](#)
- [Overview on page 64](#)
- [Configuration on page 64](#)
- [Verification on page 67](#)

## Requirements

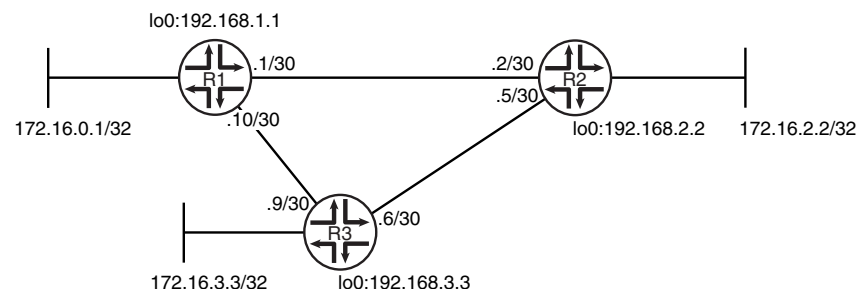
No special configuration beyond device initialization is required before configuring this example.

## 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 12 on page 64 shows the topology used in this example.

**Figure 12: 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 64 shows the configuration for all of the devices in Figure 12 on page 64. The section “Step-by-Step Procedure” on page 65 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 67](#)
- [Removing the metric-in Statement on page 67](#)

### 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 59](#)

## CHAPTER 7

# Configuring Point-to-Multipoint RIP Networks

- [Configuring Point-to-Multipoint RIP Networks Overview on page 69](#)
- [Example: Configuring Point-to-Multipoint RIP Networks on page 70](#)

## 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 70](#)

---

## Example: Configuring Point-to-Multipoint RIP Networks

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

- [Requirements on page 70](#)
- [Overview on page 70](#)
- [Configuration on page 71](#)
- [Verification on page 74](#)

### 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;)
 }
 }
 }
}
```

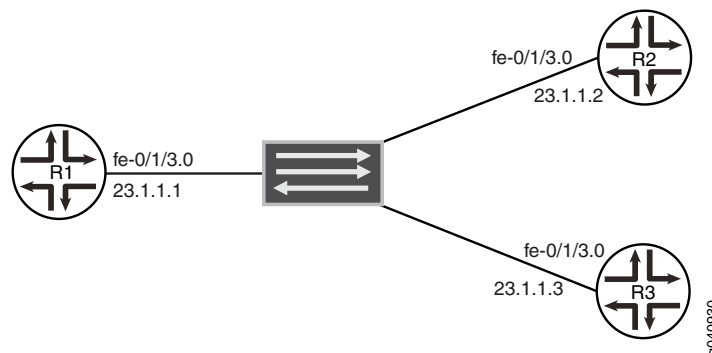
The `show rip statistics peer` command can be used to display the RIP statistics at the peer level.

### 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 13 on page 71 shows the topology used in this example.

Figure 13: Configuring a Point-to-Multipoint RIP Network



### Configuration

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLI Quick Configuration</b> | 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 <b>[edit]</b> hierarchy level.                                                                                                                                                                                                                                                                    |
| <b>Device R1</b>               | <pre> set interfaces fe-0/1/3 unit 0 family inet address 23.1.1.1/24 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 </pre> |

```
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 38](#).

**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 | rts held down | rqsts dropped | resps dropped |
|-------------|---------------|---------------|---------------|
| 3           | 0             | 0             | 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 | rts held down | rqsts dropped | resps dropped |
|-------------|---------------|---------------|---------------|
| 3           | 0             | 0             | 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 134](#)
  - [dynamic-peers on page 134](#)
  - [Example: Configuring RIP Demand Circuits on page 38](#)
  - [interface-type \(Protocols RIP\) on page 141](#)
  - [peer on page 147](#)

## CHAPTER 8

# Configuring RIP Import Policy

- [Understanding RIP Import Policy on page 77](#)
- [Example: Applying Policies to RIP Routes Imported from Neighbors on page 77](#)

## 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 77](#)

## 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 77](#)
- [Overview on page 78](#)
- [Configuration on page 78](#)
- [Verification on page 81](#)

### Requirements

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

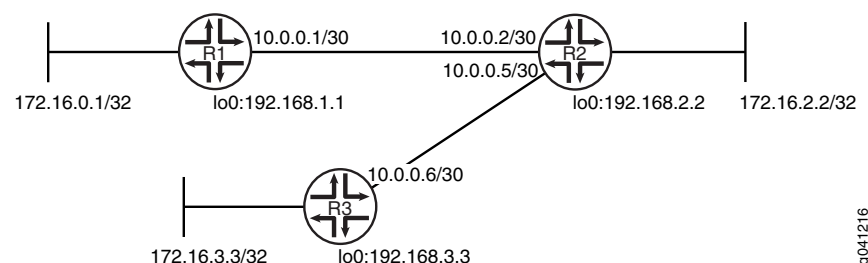
## Overview

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 14 on page 78 shows the topology used in this example.

**Figure 14: RIP Import Policy Network Topology**



"CLI Quick Configuration" on page 78 shows the configuration for all of the devices in Figure 14 on page 78. The section "Step-by-Step Procedure" on page 79 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 81](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 81](#)
- [Checking the Routing Table on page 82](#)
- [Testing the Import Policy on page 82](#)

### 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** 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 9

# Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets

- [Understanding the Sending and Receiving of RIPv1 and RIPv2 Packets on page 83](#)
- [Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 83](#)
- [Verifying the Exchange of RIP Messages on page 87](#)

## 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 83](#)

## 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 84](#)
- [Overview on page 84](#)

- [Configuration on page 84](#)
- [Verification on page 86](#)

## Requirements

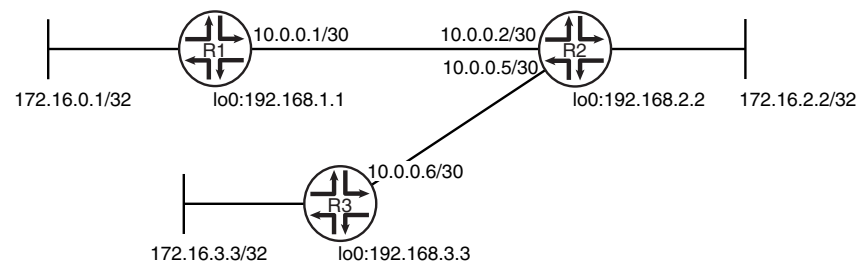
No special configuration beyond device initialization is required before configuring this example.

## Overview

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

[Figure 15 on page 84](#) shows the topology used in this example.

**Figure 15: 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 84](#) shows the configuration for all of the devices in [Figure 15 on page 84](#). The section [“Step-by-Step Procedure” on page 85](#) 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
```

```
tl-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 83](#)

# Redistributing Routes Between Two RIP Instances

- [Understanding Route Redistribution Among RIP Instances on page 89](#)
- [Example: Redistributing Routes Between Two RIP Instances on page 90](#)

## 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 90](#)

## 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 90](#)
- [Overview on page 90](#)
- [Configuration on page 91](#)
- [Verification on page 94](#)

### Requirements

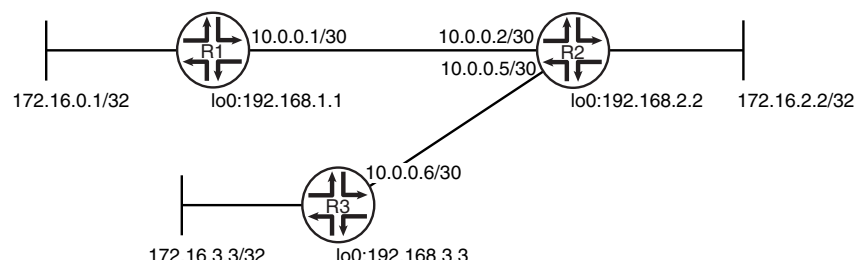
No special configuration beyond device initialization is required before configuring this example.

### 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 16 on page 91 shows the topology used in this example.

Figure 16: Redistributing Routes Between RIP Instances Network Topology



“CLI Quick Configuration” on page 91 shows the configuration for all of the devices in Figure 16 on page 91. The section “Step-by-Step Procedure” on page 92 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 172.16.0.1/32
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 11

# Tracing RIP Protocol Traffic

- [Understanding RIP Trace Operations on page 97](#)
- [Example: Tracing RIP Protocol Traffic on page 98](#)

## 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 98](#)

### Example: Tracing RIP Protocol Traffic

This example shows how to trace RIP protocol operations.

- [Requirements on page 99](#)
- [Overview on page 99](#)
- [Configuration on page 99](#)
- [Verification on page 101](#)

## Requirements

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

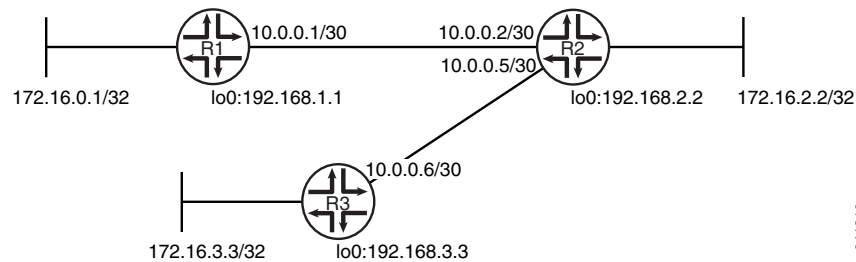
## Overview

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 17 on page 99](#) shows the topology used in this example.

**Figure 17: RIP Trace Operations Network Topology**



[“CLI Quick Configuration” on page 99](#) shows the configuration for all of the devices in [Figure 17 on page 99](#). The section [“Step-by-Step Procedure” on page 100](#) describes the steps on Device R1.

## Configuration

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLI Quick Configuration</b> | 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 <b>[edit]</b> hierarchy level.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Device R1</b>               | <pre> 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 </pre> |
| <b>Device R2</b>               | <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 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 </pre>                                                                                                                                                                                                                                                                                                                                                                |

```
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

# Troubleshooting

- [Troubleshooting Network Issues on page 105](#)
- [Monitoring and Troubleshooting a RIP Network on page 115](#)



## CHAPTER 12

# Troubleshooting Network Issues

- [Working with Problems on Your Network on page 105](#)
- [Isolating a Broken Network Connection on page 106](#)
- [Identifying the Symptoms of a Broken Network Connection on page 110](#)
- [Isolating the Causes of a Network Problem on page 111](#)
- [Taking Appropriate Action for Resolving the Network Problem on page 112](#)
- [Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 113](#)

### 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.

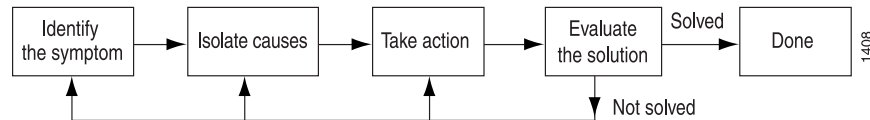
Table 6: Checklist for Working with Problems on Your Network

| Tasks                                                                                                   | Command or Action                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>“Isolating a Broken Network Connection” on page 106</b>                                              |                                                                                                                                                                          |
| 1. <a href="#">Identifying the Symptoms of a Broken Network Connection on page 107</a>                  | <code>ping (ip-address   hostname)</code><br><code>show route (ip-address   hostname)</code><br><code>traceroute (ip-address   hostname)</code>                          |
| 2. <a href="#">Isolating the Causes of a Network Problem on page 108</a>                                | <code>show &lt; configuration   interfaces   protocols   route &gt;</code>                                                                                               |
| 3. <a href="#">Taking Appropriate Action for Resolving the Network Problem on page 109</a>              | <code>[edit]</code><br><code>delete routing options static route destination-prefix</code><br><code>commit and-quit</code><br><code>show route destination-prefix</code> |
| 4. <a href="#">Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 109</a> | <code>show route (ip-address   hostname)</code><br><code>ping (ip-address   hostname) count 3</code><br><code>traceroute (ip-address   hostname)</code>                  |

## Isolating a Broken Network Connection

By applying the standard four-step process illustrated in [Figure 18 on page 106](#), 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.

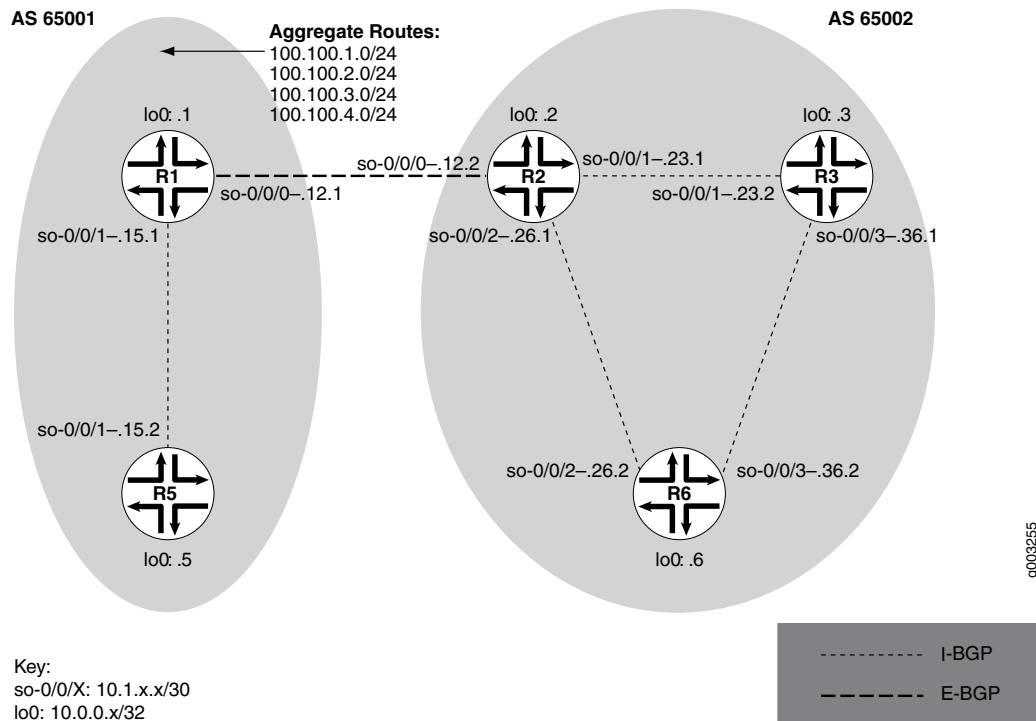
**Figure 18: Process for Diagnosing Problems in Your Network**



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 19 on page 106](#) shows the network topology used in this topic to illustrate the process of diagnosing problems in a network.

**Figure 19: Network with a Problem**



The network in [Figure 19 on page 106](#) 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 these steps:

1. [Identifying the Symptoms of a Broken Network Connection on page 107](#)
2. [Isolating the Causes of a Network Problem on page 108](#)
3. [Taking Appropriate Action for Resolving the Network Problem on page 109](#)
4. [Evaluating the Solution to Check Whether the Network Problem Is Resolved on page 109](#)

## 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 106](#), 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 **traceroute** command shows that the path from **R6** to **R5** is through **R2** (10.1.26.1), and then through **R1** (10.1.12.1).

---

## Identifying the Symptoms of a Broken Network Connection

- |                 |                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Problem</b>  | <b>Description:</b> The symptoms of a problem in your network are usually quite obvious, such as the failure to reach a remote host.                                                                                                   |
| <b>Solution</b> | 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 up
so-0/0/0.0 up up inet 10.1.56.2/30
 iso
so-0/0/2 up up up
so-0/0/2.0 up up inet 10.1.26.2/30
 iso
so-0/0/3 up up up
so-0/0/3.0 up up inet 10.1.36.2/30
 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 106](#), 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 **traceroute** 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 115](#)
- [Understanding RIP Trace Operations on page 116](#)
- [Example: Tracing RIP Protocol Traffic on page 118](#)
- [Verifying a RIP Configuration on page 121](#)

## 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 7 on page 115](#) summarizes key output fields in the RIP routing display in the J-Web interface.

**Table 7: Summary of Key RIP Routing Output Fields**

| Field                 | Values                            | Additional Information |
|-----------------------|-----------------------------------|------------------------|
| <b>RIP Statistics</b> |                                   |                        |
| Protocol Name         | The RIP protocol name.            |                        |
| Port number           | The port on which RIP is enabled. |                        |

Table 7: 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.                                                           |                                                                                                                       |
| <b>RIP Neighbors</b>     |                                                                                        |                                                                                                                       |
| 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: <b>Up</b> or <b>Dn</b> (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 98](#)

## Example: Tracing RIP Protocol Traffic

This example shows how to trace RIP protocol operations.

- [Requirements on page 118](#)
- [Overview on page 118](#)
- [Configuration on page 118](#)
- [Verification on page 121](#)

## Requirements

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

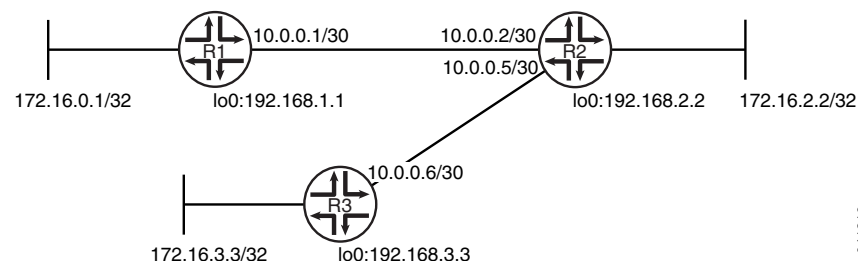
## Overview

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 17 on page 99](#) shows the topology used in this example.

**Figure 20: RIP Trace Operations Network Topology**



[“CLI Quick Configuration” on page 99](#) shows the configuration for all of the devices in [Figure 17 on page 99](#). The section [“Step-by-Step Procedure” on page 100](#) 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 122](#)
- [Verifying Reachability of All Hosts in the RIP Network on page 122](#)

## 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) (null) mcast both 1
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.

## 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 routera-fxp0.englab.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.

**Related  
Documentation**

- [RIP Configuration Overview on page 8](#)
- [show rip statistics on page 183](#) in the CLI Explorer
- [show rip neighbor on page 181](#) in the CLI Explorer
- [traceroute](#) in the CLI Explorer
- [RIP Overview on page 3](#)



## PART 4

# Configuration Statements and Operational Commands

- Configuration Statements on page 127
- Operational Commands on page 159





## CHAPTER 14

# Configuration Statements

- [any-sender](#) on page 128
- [authentication-key \(Protocols RIP\)](#) on page 129
- [authentication-type \(Protocols RIP\)](#) on page 130
- [bfd-liveness-detection \(Protocols RIP\)](#) on page 131
- [check-zero](#) on page 133
- [demand-circuit \(Protocols RIP\)](#) on page 134
- [dynamic-peers](#) on page 134
- [export](#) on page 135
- [graceful-restart \(Protocols RIP\)](#) on page 136
- [group \(Protocols RIP\)](#) on page 137
- [holddown \(Protocols RIP\)](#) on page 139
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- [interface-type \(Protocols RIP\)](#) on page 141
- [max-retrans-time](#) on page 142
- [message-size](#) on page 143
- [metric-in \(Protocols RIP\)](#) on page 144
- [metric-out](#) on page 145
- [neighbor](#) on page 146
- [peer \(Protocols RIP\)](#) on page 147
- [preference \(Protocols RIP\)](#) on page 148
- [receive \(Protocols RIP\)](#) on page 149
- [rib-group \(Protocols RIP\)](#) on page 150
- [rip](#) on page 150
- [route-timeout \(Protocols RIP\)](#) on page 151
- [routing-instances \(Multiple Routing Entities\)](#) on page 152
- [send \(Protocols RIP\)](#) on page 153
- [traceoptions \(Protocols RIP\)](#) on page 154
- [update-interval \(Protocols RIP\)](#) on page 157

## any-sender

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | any-sender;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.0.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | Disable strict sender address checks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                         |

## authentication-key (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>authentication-key password;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | Require authentication for RIP route queries received on an interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Options</b>                  | <b><i>password</i></b> —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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Route Authentication for RIP on page 23</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## authentication-type (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>authentication-type type;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | Configure the type of authentication for RIP route queries received on an interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Default</b>                  | If you do not include this statement and the <b>authentication-key</b> statement, RIP authentication is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                  | <p><b>type</b>—Authentication type:</p> <ul style="list-style-type: none"> <li>• <b>md5</b>—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.</li> <li>• <b>none</b>—Disable authentication. If <b>none</b> is configured, the configured authentication key is ignored.</li> <li>• <b>simple</b>—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.</li> </ul>                                                                                                                                                                   |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Route Authentication for RIP on page 23</a></li> <li>• <a href="#">authentication-key on page 129</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## bfd-liveness-detection (Protocols RIP)

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <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>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>     | <p>[edit logical-systems <i>logical-system-name</i> protocols rip <b>group</b> <i>group-name</i>],<br/> [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols<br/> rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/> [edit protocols rip <b>group</b> <i>group-name</i>],<br/> [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b><br/> <i>neighbor-name</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Release Information</b> | <p>Statement introduced in Junos OS Release 8.0.</p> <p>Options <b>detection-time threshold</b> and <b>transmit-interval threshold</b> introduced in Junos OS Release 8.2.</p> <p>Support for logical systems introduced in Junos OS Release 8.3.</p> <p>Option <b>no-adaptation</b> introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Options <b>authentication algorithm</b>, <b>authentication key-chain</b>, and <b>authentication loose-check</b> introduced in Junos OS Release 9.6.</p> <p>Options <b>authentication algorithm</b>, <b>authentication key-chain</b>, and <b>authentication loose-check</b> 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> |
| <b>Description</b>         | <p>Configure bidirectional failure detection timers and authentication.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>             | <p><b>authentication algorithm</b> <i>algorithm-name</i> —Configure the algorithm used to authenticate the specified BFD session: <b>simple-password</b>, <b>keyed-md5</b>, <b>keyed-sha-1</b>, <b>meticulous-keyed-md5</b>, or <b>meticulous-keyed-sha-1</b>.</p> <p><b>authentication key-chain</b> <i>key-chain-name</i>—Associate a security key with the specified BFD session using the name of the security keychain. The name you specify must</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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 44](#)
- [Example: Configuring BFD Authentication for RIP on page 51](#)

## check-zero

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | (check-zero   no-check-zero);                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <b>rip</b>],<br/>         [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>         [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <b>rip</b>],<br/>         [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>         [edit protocols <b>rip</b>],<br/>         [edit protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>         [edit routing-instances <i>routing-instance-name</i> protocols <b>rip</b>],<br/>         [edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | <p>Check whether the reserved fields in a RIP packet are zero:</p> <ul style="list-style-type: none"> <li>• <b>check-zero</b>—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.</li> <li>• <b>no-check-zero</b>—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.</li> </ul>                                                                                                                                                                                                                                            |
| <b>Default</b>                  | <b>check-zero</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## demand-circuit (Protocols RIP)

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | demand-circuit;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> ],<br>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit protocols rip group <i>group-name</i> ],<br>[edit protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ] |
| <b>Release Information</b>      | Statement introduced in Release 11.1 of Junos OS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Default</b>                  | Disabled. You must explicitly configure two neighboring interfaces to act as a RIP demand circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring RIP Demand Circuits on page 38</a></li><li>• <a href="#">RIP Demand Circuits Overview on page 36</a></li><li>• <a href="#">max-retrans-time on page 142</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |


## dynamic-peers

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|                                 |                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | dynamic-peers;                                                                                                                                                                                         |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ],<br>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.4.                                                                                                                                                         |
| <b>Description</b>              | Configure an interface to have dynamic peers in a point-to-multipoint RIP network.                                                                                                                     |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Point-to-Multipoint RIP Networks on page 70</a></li></ul>                                                                     |



## export

|                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                    | <code>export [ <i>policy-names</i> ];</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Hierarchy Level</b>                                                                                                                                                                                           | <p>[edit logical-systems <i>logical-system-name</i> protocols rip <b>group</b> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip <b>group</b> <i>group-name</i>],</p> <p>[edit protocols rip <b>group</b> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip <b>group</b> <i>group-name</i>]</p>                                                                      |
| <b>Release Information</b>                                                                                                                                                                                       | <p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>                                                                                                                                                                                               | <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 <b>metric-in</b> and <b>metric-out</b> statements.</p> |
| <div>  <p><b>NOTE:</b> The export policy on RIP does not support manipulating routing information of the next hop.</p> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b>                                                                                                                                                                                                   | <b><i>policy-names</i></b> —Name of one or more policies.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Required Privilege Level</b>                                                                                                                                                                                  | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Related Documentation</b>                                                                                                                                                                                     | <ul style="list-style-type: none"> <li><a href="#">import on page 140</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                    |

## graceful-restart (Protocols RIP)

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|                                 |                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>graceful-restart {<br/>  disable;<br/>  restart-time <i>seconds</i>;<br/>}</pre>                                      |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a> ],<br>[edit protocols <a href="#">rip</a> ] |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.  |
| <b>Description</b>              | Configure graceful restart for RIP.                                                                                        |
| <b>Options</b>                  | <b>disable</b> —Disables graceful restart for RIP.<br><br>The remaining statement is explained separately.                 |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Junos OS High Availability Library for Routing Devices</i></li></ul>            |

## 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.

**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)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>holddown seconds;</code>                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>]</p>                                   |
| <b>Release Information</b>      | <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>                                                                                                                                                                                            |
| <b>Description</b>              | <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> |
| <b>Options</b>                  | <p><b>seconds</b>—Estimated time to wait before making updates to the routing table.</p> <p><b>Range:</b> 10 through 180 seconds</p> <p><b>Default:</b> 180 seconds</p>                                                                                                                                                                                                                                  |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring RIP Timers on page 30</a></li> <li>• <a href="#">RIP Demand Circuits Overview on page 36</a></li> </ul>                                                                                                                                                                                                                        |

## import (Protocols RIP)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>import [ <i>policy-names</i> ];</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Hierarchy Level</b>          | <code>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</code><br><code>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a></code><br><code>  <i>neighbor-name</i>],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code><br><code>  <a href="#">rip</a>],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code><br><code>  rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</code><br><code>[edit protocols <a href="#">rip</a>],</code><br><code>[edit protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a></code><br><code>  <i>neighbor-name</i>]</code> |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 12.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | Apply one or more policies to routes being imported by the local routing device from neighbors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Options</b>                  | <i>policy-names</i> —Name of one or more policies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Applying Policies to RIP Routes Imported from Neighbors on page 77</a></li><li>• <a href="#">Junos OS Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</a></li><li>• <a href="#">export on page 135</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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## interface-type (Protocols RIP)

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|                                 |                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | interface-type p2mp;                                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ],<br>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.4.                                                                                                                                                         |
| <b>Description</b>              | Configure the type of interface in a RIP network.<br><br>This statement enables a RIP device to have single or multiple peers through an interface.                                                    |
| <b>Options</b>                  | <b>p2mp</b> —Configure an interface in a RIP network as a point-to-multipoint interface.                                                                                                               |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Point-to-Multipoint RIP Networks on page 70</a></li></ul>                                                                     |

## max-retrans-time

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | max-retrans-time <i>seconds</i> ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i>],<br/>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>[edit protocols rip group <i>group-name</i>],<br/>[edit protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],<br/>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i>],<br/>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | <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> $5 \text{ seconds} \times \text{number of retransmissions} = \text{retransmission seconds}$                                                                                                                                    |
| <b>Options</b>                  | <p><b>seconds</b>—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><b>Range:</b> 5 through 180 seconds</p> <p><b>Default:</b> 5 seconds</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring RIP Demand Circuits on page 38</a></li><li>• <a href="#">RIP Demand Circuits Overview on page 36</a></li><li>• <a href="#">demand-circuit on page 134</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



## message-size

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>message-size <i>number</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | <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> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Options</b>                  | <p><i>number</i>—Number of route entries per update message.</p> <p><b>Range:</b> 25 through 255 entries</p> <p><b>Default:</b> 25 entries</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Required Privilege Level</b> | <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)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>metric-in <i>metric</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | <code>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</code><br><code>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a></code><br><code>  <i>neighbor-name</i>],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code><br><code>  <a href="#">rip</a>],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code><br><code>  rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</code><br><code>[edit protocols <a href="#">rip</a>],</code><br><code>[edit protocols rip group <i>group-name</i> <a href="#">neighbor</a> <i>neighbor-name</i>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor</a></code><br><code>  <i>neighbor-name</i>]</code> |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 12.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Options</b>                  | <b><i>metric</i></b> —Metric value.<br><b>Range:</b> 1 through 16<br><b>Default:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Required Privilege Level</b> | <b>routing</b> —To view this statement in the configuration.<br><b>routing-control</b> —To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring the Metric Value Added to Imported RIP Routes on page 63</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## metric-out

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>metric-out <i>metric</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <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> <b>neighbor</b> <i>neighbor-name</i>],</p> <p>[edit protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                  | <p><b><i>metric</i></b>—Metric value.</p> <p><b>Range:</b> 1 through 16</p> <p><b>Default:</b> 1</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Required Privilege Level</b> | <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](#).

|                           |                                                             |
|---------------------------|-------------------------------------------------------------|
| <b>Required Privilege</b> | routing—To view this statement in the configuration.        |
| <b>Level</b>              | routing-control—To add this statement to the configuration. |

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## peer (Protocols RIP)

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|                              |                                                                                                                                                                                                        |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                | <code>peer IP address;</code>                                                                                                                                                                          |
| <b>Hierarchy Level</b>       | [edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ],<br>[edit protocols rip group <i>group-name</i> neighbor <i>neighbor-name</i> ] |
| <b>Release Information</b>   | Statement introduced in Junos OS Release 11.4.                                                                                                                                                         |
| <b>Description</b>           | Configure a static peer for an interface in a point-to-multipoint RIP network.                                                                                                                         |
| <b>Options</b>               | <b>address</b> —IP address of the static peer to be configured.                                                                                                                                        |
| <b>Required Privilege</b>    | interface—To view this statement in the configuration.                                                                                                                                                 |
| <b>Level</b>                 | interface-control—To add this statement to the configuration.                                                                                                                                          |
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Point-to-Multipoint RIP Networks on page 70</a></li></ul>                                                                     |

## preference (Protocols RIP)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>preference <i>preference</i>;</code>                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols rip <b>group</b> <i>group-name</i> ],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols<br>rip <b>group</b> <i>group-name</i> ],<br>[edit protocols rip <b>group</b> <i>group-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols rip <b>group</b> <i>group-name</i> ] |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | <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>           |
| <b>Options</b>                  | <p><b>preference</b>—Preference value. A lower value indicates a more preferred route.</p> <p><b>Range:</b> 0 through 4,294,967,295 (<math>2^{32} - 1</math>)</p> <p><b>Default:</b> 100</p>                                                                                                                                                                                                                           |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Route Preferences Overview</i></li></ul>                                                                                                                                                                                                                                                                                                                                    |

## receive (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>receive receive-options;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor neighbor-name</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor neighbor-name</a>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit protocols rip group <i>group-name</i> <a href="#">neighbor neighbor-name</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <a href="#">neighbor neighbor-name</a>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Configure RIP receive options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <p><i>receive-options</i>—One of the following:</p> <ul style="list-style-type: none"> <li>• <b>both</b>—Accept both RIP version 1 and version 2 packets.</li> <li>• <b>none</b>—Do not receive RIP packets.</li> <li>• <b>version-1</b>—Accept only RIP version 1 packets.</li> <li>• <b>version-2</b>—Accept only RIP version 2 packets.</li> </ul> <p><b>Default:</b> <b>both</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 83</a></li> <li>• <a href="#">send on page 153</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## rib-group (Protocols RIP)

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|                                 |                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>rib-group group-name;</code>                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a> ],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a> ],<br>[edit protocols <a href="#">rip</a> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a> ] |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 12.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                              |
| <b>Description</b>              | Install RIP routes into multiple routing tables by configuring a routing table group.                                                                                                                                                                                                                                                                   |
| <b>Options</b>                  | <i>group-name</i> —Name of the routing table group.                                                                                                                                                                                                                                                                                                     |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Redistributing Routes Between Two RIP Instances on page 90</a></li></ul>                                                                                                                                                                                                                   |

## rip

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|                                 |                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>rip {...}</code>                                                                                                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols],<br>[edit protocols],<br>[edit routing-instances <i>routing-instance-name</i> protocols]        |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 12.1 for the QFX Series.<br>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>              | Enable RIP routing on the routing device.                                                                                                                                                                                                                                  |
| <b>Default</b>                  | RIP is disabled on the routing device.                                                                                                                                                                                                                                     |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Configuring RIP</a></li></ul>                                                                                                                                                                                 |



## route-timeout (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>route-timeout seconds;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip <a href="#">group</a> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip <a href="#">group</a> <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 <a href="#">group</a> <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip <a href="#">group</a> <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit protocols rip <a href="#">group</a> <i>group-name</i>],</p> <p>[edit protocols rip <a href="#">group</a> <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip <a href="#">group</a> <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip <a href="#">group</a> <i>group-name</i> neighbor <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                  | <p><b>seconds</b>—Estimated time to wait before making updates to the routing table.</p> <p><b>Range:</b> 30 through 360 seconds</p> <p><b>Default:</b> 180 seconds</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring RIP Timers on page 30</a></li> <li>• <a href="#">RIP Demand Circuits Overview on page 36</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## routing-instances (Multiple Routing Entities)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>routing-instances <i>routing-instance-name</i> { ... }</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Hierarchy Level</b>          | [edit],<br>[edit logical-systems <i>logical-system-name</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | <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"><li>• A set of routing tables</li><li>• A set of interfaces that belong to these routing tables</li><li>• A set of routing option configurations</li></ul> <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 <b>my-instance</b>, its corresponding IP unicast table is my-instance.inet.0. All routes for <b>my-instance</b> are installed into my-instance.inet.0.</p> <p>Routes are installed into the default routing instance inet.0 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 multipotology routing (MTR) is enabled.</p> |
| <b>Default</b>                  | Routing instances are disabled for the router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <b><i>routing-instance-name</i></b> —Name of the routing instance. This must be a non-reserved string of not more than 128 characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.<br>routing-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <i>Example: Configuring Interprovider Layer 3 VPN Option A</i></li><li>• <i>Example: Configuring Interprovider Layer 3 VPN Option B</i></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

- [Example: Configuring Interprovider Layer 3 VPN Option C](#)

## send (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>send <i>send-options</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <code>rip</code>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols rip group <i>group-name</i> <code>neighbor</code> <i>neighbor-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <code>rip</code>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <code>neighbor</code> <i>neighbor-name</i>],</p> <p>[edit protocols <code>rip</code>],</p> <p>[edit protocols rip group <i>group-name</i> <code>neighbor</code> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <code>rip</code>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols rip group <i>group-name</i> <code>neighbor</code> <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | Configure RIP send options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><i>send-options</i>—One of the following:</p> <ul style="list-style-type: none"> <li>• <b>broadcast</b>—Broadcast RIP version 2 packets (RIP version 1 compatible).</li> <li>• <b>multicast</b>—Multicast RIP version 2 packets. This is the default.</li> <li>• <b>none</b>—Do not send RIP updates.</li> <li>• <b>version-1</b>—Broadcast RIP version 1 packets.</li> </ul> <p><b>Default:</b> multicast</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring the Sending and Receiving of RIPv1 and RIPv2 Packets on page 83</a></li> <li>• <a href="#">receive on page 149</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## traceoptions (Protocols RIP)

|                            |                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>              | <pre>traceoptions {     file <i>filename</i> &lt;files <i>number</i>&gt; &lt;size <i>size</i>&gt; &lt;world-readable   no-world-readable&gt;;     flag <i>flag</i> &lt;flag-modifier&gt; &lt;disable&gt;; }</pre>                                                                                                                                                      |
| <b>Hierarchy Level</b>     | <p>[edit logical-systems <i>logical-system-name</i> protocols <a href="#">rip</a>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>],</p> <p>[edit protocols <a href="#">rip</a>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <a href="#">rip</a>]</p> |
| <b>Release Information</b> | <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>                                                                          |
| <b>Description</b>         | Set RIP protocol-level tracing options.                                                                                                                                                                                                                                                                                                                                |



**NOTE:** The **traceoptions** statement is not supported on QFabric systems.

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | The default RIP protocol-level trace options are inherited from the global <b>traceoptions</b> statement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b> | <p><b>disable</b>—(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 <b>all</b>.</p> <p><b>file <i>filename</i></b>—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><b>files <i>number</i></b>—(Optional) Maximum number of trace files. When a trace file named <b>trace-file</b> reaches its maximum size, it is renamed <b>trace-file.0</b>, then <b>trace-file.1</b>, 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 <b>size</b> option.</p> <p><b>Range:</b> 2 through 1000 files</p> <p><b>Default:</b> 10 files</p> <p><b>flag <i>flag</i></b>—Tracing operation to perform. To specify more than one tracing operation, include multiple <b>flag</b> statements.</p> <p><b>RIP Tracing Options</b></p> <ul style="list-style-type: none"> <li><b>auth</b>—RIP authentication</li> </ul> |

- **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.

|                                 |                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | routing—To view this statement in the configuration.                                                               |
|                                 | routing-control—To add this statement to the configuration.                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Example: Tracing RIP Protocol Traffic on page 98</a></li></ul> |

## update-interval (Protocols RIP)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>update-interval seconds;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols <b>rip</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols <b>rip</b> group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols <b>rip</b> 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 <b>rip</b>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <b>rip</b> group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols <b>rip</b> group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols <b>rip</b>],</p> <p>[edit protocols <b>rip</b> group <i>group-name</i>],</p> <p>[edit protocols <b>rip</b> group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <b>rip</b>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <b>rip</b> group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols <b>rip</b> group <i>group-name</i> neighbor <i>neighbor-name</i>]</p> |
| <b>Release Information</b>      | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                  | <p><b>seconds</b>—Estimated time to wait before making updates to the routing table.</p> <p><b>Range:</b> 10 through 60 seconds</p> <p><b>Default:</b> 30 seconds</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Required Privilege Level</b> | <p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring RIP Timers on page 30</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |





## CHAPTER 15

# 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

---

|                                                   |                                                                                                                                                                                                                                                                    |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 161</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 161</a>                                                                                                                                                       |
| <b>Syntax</b>                                     | clear rip general-statistics<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                               |
| <b>Syntax (EX Series Switches and QFX Series)</b> | clear rip general-statistics                                                                                                                                                                                                                                       |
| <b>Release Information</b>                        | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 12.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                | Clear RIP general statistics.                                                                                                                                                                                                                                      |
| <b>Options</b>                                    | <b>none</b> —Clear RIP general statistics.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.                                                            |
| <b>Required Privilege Level</b>                   | clear                                                                                                                                                                                                                                                              |
| <b>Related Documentation</b>                      | <ul style="list-style-type: none"> <li>• <a href="#">show rip general-statistics on page 179</a></li> </ul>                                                                                                                                                        |
| <b>List of Sample Output</b>                      | <a href="#">clear rip general-statistics on page 161</a>                                                                                                                                                                                                           |
| <b>Output Fields</b>                              | 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

---

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 162</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 162</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax</b>                                     | <code>clear rip statistics</code><br><code>&lt;instance (all   <i>instance-name</i>)&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code><br><code>&lt;neighbor&gt;</code><br><code>&lt;peer (all   <i>address</i>)&gt;</code>                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (EX Series Switches and QFX Series)</b> | <code>clear rip statistics</code><br><code>&lt;instance (all   <i>instance-name</i>)&gt;</code><br><code>&lt;neighbor&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>                        | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 12.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                               |
| <b>Description</b>                                | Clear RIP statistics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                                    | <b>none</b> —Reset RIP counters for all neighbors for all routing instances.<br><br><b>instance (all   <i>instance-name</i>)</b> —(Optional) Clear RIP statistics for all instances or for the specified routing instance only.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.<br><br><b>neighbor</b> —(Optional) Clear RIP statistics for the specified neighbor only.<br><br><b>peer (all   <i>address</i>)</b> —(Optional) Clear RIP statistics for a single peer or all peers. |
| <b>Required Privilege Level</b>                   | clear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>                      | <ul style="list-style-type: none"><li>• <a href="#">show rip statistics on page 183</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>List of Sample Output</b>                      | <a href="#">clear rip statistics on page 162</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Output Fields</b>                              | 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 163](#)

[Syntax \(ACX Series Routers\) on page 163](#)  
[Syntax \(EX Series Switches\) on page 163](#)  
[Syntax \(MX Series Routers\) on page 164](#)  
[Syntax \(QFX Series\) on page 164](#)  
[Syntax \(Routing Matrix\) on page 164](#)  
[Syntax \(TX Matrix Routers\) on page 164](#)  
[Syntax \(TX Matrix Plus Routers\) on page 165](#)  
[Syntax \(MX Series Routers\) on page 165](#)  
[Syntax \(QFX Series\) on page 165](#)

### 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 | mountd-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  
| ppp | pppoe | redundancy-interface-process | remote-operations | routing <logical-system  
*logical-system-name*> | sampling | service-deployment | snmp | statistics-service>

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | <p>&lt;all-chassis   all-lcc   lcc <i>number</i>   scc&gt;</p> <p>&lt;gracefully   immediately   soft&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax (TX Matrix Plus Routers)</b> | <p>restart</p> <p>&lt;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 &lt;logical-system <i>logical-system-name</i>&gt;   sampling   service-deployment   snmp   statistics-service&gt;</p> <p>&lt;all-chassis   all-lcc   all-sfc   lcc <i>number</i>   sfc <i>number</i>&gt;</p> <p>&lt;gracefully   immediately   soft&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax (MX Series Routers)</b>      | <p>restart</p> <p>&lt;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   mobile-ip   mountd-service   mpls-traceroute   mspd   multicast-snooping   named-service   nfsd-service   packet-triggered-subscribers   peer-selection-service   pgcp-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 &lt;logical-system <i>logical-system-name</i>&gt;   sampling   sbc-configuration-process   sdk-service   service-deployment   services   services pgcp gateway <i>gateway-name</i>   snmp   soft   static-subscribers   statistics-service   subscriber-management   subscriber-management-helper   tunnel-oamd   usb-control   vrrp   web-management&gt;</p> <p>&lt;all-members&gt;</p> <p>&lt;gracefully   immediately   soft&gt;</p> <p>&lt;local&gt;</p> <p>&lt;member <i>member-id</i>&gt;</p> |
| <b>Syntax (QFX Series)</b>             | <p>restart</p> <p>&lt;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   <i>logical-system-name</i>&gt;   routing   sampling   secure-neighbor-discovery   service-deployment   snmp   usb-control   web-management&gt;</p> <p>&lt;gracefully   immediately   soft&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>             | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.  
Options added:

- **dynamic-flow-capture** in Junos OS Release 7.4.
- **dls** 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.

**datapath-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 interfaces on page 173](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### [restart interfaces](#)

```
user@host> restart interfaces
interfaces process terminated
interfaces process restarted
```

## show policy

---

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| List of Syntax              | <a href="#">Syntax on page 174</a><br><a href="#">Syntax (EX Series Switches) on page 174</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Syntax                      | <pre>show policy &lt;logical-system (all   <i>logical-system-name</i>)&gt; &lt;<i>policy-name</i>&gt; &lt;<i>statistics</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Syntax (EX Series Switches) | <pre>show policy &lt;<i>policy-name</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Release Information         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br><b>statistics</b> option introduced in Junos OS Release 16.1 for MX Series routers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Description                 | Display information about configured routing policies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Options                     | <p><b>none</b>—List the names of all configured routing policies.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b><i>policy-name</i></b>—(Optional) Show the contents of the specified policy.</p> <p><b>statistics</b>—(Optional) Use in conjunction with the <b>test policy</b> 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"><li>• <a href="#">show policy damping</a></li><li>• <a href="#">test policy on page 355</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| List of Sample Output       | <a href="#">show policy on page 175</a><br><a href="#">show policy <i>policy-name</i> on page 175</a><br><a href="#">show policy statistics <i>policy-name</i> on page 175</a><br><a href="#">show policy (Multicast Scoping) on page 176</a><br><a href="#">show policy (Route Filter and source Address Filter Lists) on page 176</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Output Fields               | <a href="#">Table 8 on page 175</a> lists the output fields for the <b>show policy</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



Table 8: 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 <b>unnamed</b> 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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <pre>show policy conditions &lt;condition-name&gt; &lt;detail&gt; &lt;dynamic&gt; &lt;logical-system (all   logical-system-name)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (EX Series Switches)</b> | <pre>show policy conditions &lt;condition-name&gt; &lt;detail&gt; &lt;dynamic&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>         | <p>Command introduced in Junos OS Release 9.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>                 | <p>Display all the configured conditions as well as the routing tables with which the configuration manager is interacting. If the <b>detail</b> keyword is included, the output also displays dependent routes for each condition.</p>                                                                                                                                                                                                                                                                            |
| <b>Options</b>                     | <p><b>none</b>—Display all configured conditions and associated routing tables.</p> <p><b>condition-name</b>—(Optional) Display information about the specified condition only.</p> <p><b>detail</b>—(Optional) Display the specified level of output.</p> <p><b>dynamic</b>—(Optional) Display information about the conditions in the dynamic database.</p> <p><b>logical-system (all   logical-system-name)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>       | <a href="#">show policy conditions detail on page 178</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Output Fields</b>               | <p><a href="#">Table 9 on page 177</a> lists the output fields for the <b>show policy conditions</b> command. Output fields are listed in the approximate order in which they appear.</p>                                                                                                                                                                                                                                                                                                                          |

**Table 9: show policy conditions Output Fields**

| Field Name              | Field Description                                                                                                                                  | Level of Output |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Condition</b>        | Name of configured condition.                                                                                                                      | All levels      |
| <b>event</b>            | Condition type. If the <b>if-route-exists</b> option is configured, the event type is:<br><b>Existence of a route in a specific routing table.</b> | All levels      |
| <b>Dependent routes</b> | List of routes dependent on the condition, along with the latest generation number.                                                                | <b>detail</b>   |
| <b>Condition tables</b> | List of routing tables associated with the condition, along with the latest generation number and number of dependencies.                          | All levels      |

Table 9: show policy conditions Output Fields (*continued*)

| Field Name                 | Field Description                                                         | Level of Output |
|----------------------------|---------------------------------------------------------------------------|-----------------|
| 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

|                                                   |                                                                                                                                                                                                                                                                    |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 179</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 179</a>                                                                                                                                                       |
| <b>Syntax</b>                                     | show rip general-statistics<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                |
| <b>Syntax (EX Series Switches and QFX Series)</b> | show rip general-statistics                                                                                                                                                                                                                                        |
| <b>Release Information</b>                        | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 12.1 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. |
| <b>Description</b>                                | Display brief RIP statistics.                                                                                                                                                                                                                                      |
| <b>Options</b>                                    | none—Display brief RIP statistics.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.                                                                    |
| <b>Required Privilege Level</b>                   | view                                                                                                                                                                                                                                                               |
| <b>Related Documentation</b>                      | <ul style="list-style-type: none"> <li>• <a href="#">clear rip general-statistics on page 161</a></li> </ul>                                                                                                                                                       |
| <b>List of Sample Output</b>                      | <a href="#">show rip general-statistics on page 179</a>                                                                                                                                                                                                            |
| <b>Output Fields</b>                              | Table 10 on page 179 lists the output fields for the <b>show rip general-statistics</b> command. Output fields are listed in the approximate order in which they appear.                                                                                           |

**Table 10: 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

---

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 181</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 181</a>                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax</b>                                     | <pre>show rip neighbor &lt;instance (all   <i>instance-name</i>)&gt; &lt;logical-system (all   <i>logical-system-name</i>)&gt; &lt;name&gt;</pre>                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax (EX Series Switches and QFX Series)</b> | <pre>show rip neighbor &lt;instance (all   <i>instance-name</i>)&gt; &lt;name&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>                        | <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>                                                                                                                                                                                                                         |
| <b>Description</b>                                | Display information about RIP neighbors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                                    | <p><b>none</b>—Display information about all RIP neighbors for all instances.</p> <p><b>instance (all   <i>instance-name</i>)</b>—(Optional) Display RIP neighbor information for all instances or for only the specified routing instance.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b>name</b>—(Optional) Display detailed information about only the specified RIP neighbor.</p> |
| <b>Required Privilege Level</b>                   | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>List of Sample Output</b>                      | <a href="#">show rip neighbor on page 182</a><br><a href="#">show rip neighbor (With Demand Circuits Configured) on page 182</a>                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Output Fields</b>                              | <p><a href="#">Table 11 on page 182</a> lists the output fields for the <b>show rip neighbor</b> command. Output fields are listed in the approximate order in which they appear.</p>                                                                                                                                                                                                                                                                                                                         |

Table 11: show rip neighbor Output Fields

| Field Name                 | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Neighbor</b>            | Name of the RIP neighbor.<br><br><b>NOTE:</b> 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.<br><br>If you configure demand circuits at the <b>[edit protocols rip group group-name neighbor neighbor-name]</b> hierarchy level, the output shows only the neighboring interface that you specifically configured as a demand circuit. If you configure demand circuits at the <b>[edit protocols rip group group-name]</b> 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. |
| <b>State</b>               | State of the connection: <b>Up</b> or <b>Dn</b> (Down).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Source Address</b>      | Address of the port on the local router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Destination Address</b> | Address of the port on the remote router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Send Mode</b>           | Send options: <b>broadcast</b> , <b>multicast</b> , <b>none</b> , or <b>version 1</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Receive Mode</b>        | Type of packets to accept: <b>both</b> , <b>none</b> , <b>version 1</b> , or <b>version 2</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>In Met</b>              | 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

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 183</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 183</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax</b>                                     | <pre>show rip statistics &lt;instance (all   <i>instance-name</i>)&gt; &lt;logical-system (all   <i>logical-system-name</i>)&gt; &lt;<i>name</i>&gt; &lt;peer (all   <i>address</i>)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (EX Series Switches and QFX Series)</b> | <pre>show rip statistics &lt;instance (all   <i>instance-name</i>)&gt; &lt;<i>name</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>                        | <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>                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                                | Display RIP statistics about messages sent and received on an interface, as well as information received from advertisements from other routing devices.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                                    | <p><b>none</b>—Display RIP statistics for all routing instances.</p> <p><b>instance (all   <i>instance-name</i>)</b>—(Optional) Display RIP statistics for all instances or for only the specified routing instance.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b><i>name</i></b>—(Optional) Display detailed information about only the specified RIP neighbor.</p> <p><b>peer (all   <i>address</i>)</b>—(Optional) Display RIP statistics for a single peer or all peers.</p> |
| <b>Required Privilege Level</b>                   | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>                      | <ul style="list-style-type: none"> <li>• <a href="#">clear rip statistics on page 162</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>                      | <a href="#">show rip statistics on page 184</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Output Fields</b>                              | <p><a href="#">Table 12 on page 184</a> lists the output fields for the <b>show rip statistics</b> command. Output fields are listed in the approximate order in which they appear.</p>                                                                                                                                                                                                                                                                                                                                                                                                                   |

Table 12: show rip statistics Output Fields

| Field Name               | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RIP info</b>          | <p>Information about RIP on the specified interface:</p> <ul style="list-style-type: none"> <li>• <b>port</b>—UDP port number used for RIP.</li> <li>• <b>update interval</b>—Interval between routing table updates, in seconds.</li> <li>• <b>holddown</b>—Hold-down interval, in seconds.</li> <li>• <b>timeout</b>—Timeout interval, in seconds.</li> <li>• <b>restart in progress</b>—Graceful restart status. Displayed when RIP is or has been in the process of graceful restart.</li> <li>• <b>restart time</b>—Estimated time for the graceful restart to finish, in seconds.</li> <li>• <b>restart will complete in</b>—Remaining time for the graceful restart to finish, in seconds.</li> <li>• <b>rts learned</b>—Number of routes learned through RIP.</li> <li>• <b>rts held down</b>—Number of routes held down by RIP.</li> <li>• <b>rqsts dropped</b>—Number of received request packets that were dropped.</li> <li>• <b>resps dropped</b>—Number of received response packets that were dropped.</li> </ul>                                                                                                                                                             |
| <b>logical-interface</b> | <p>Name of the logical interface and its statistics:</p> <ul style="list-style-type: none"> <li>• <b>routes learned</b>—Number of routes learned on the logical interface.</li> <li>• <b>routes advertised</b>—Number of routes advertised by the logical interface.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Counter</b>           | <p>List of counter types:</p> <ul style="list-style-type: none"> <li>• <b>Updates Sent</b>—Number of update messages sent.</li> <li>• <b>Triggered Updates Sent</b>—Number of triggered update messages sent.</li> <li>• <b>Responses Sent</b>—Number of response messages sent.</li> <li>• <b>Bad Messages</b>—Number of invalid messages received.</li> <li>• <b>RIPv1 Updates Received</b>—Number of RIPv1 update messages received.</li> <li>• <b>RIPv1 Bad Route Entries</b>—Number of RIPv1 invalid route entry messages received.</li> <li>• <b>RIPv1 Updates Ignored</b>—Number of RIPv1 update messages ignored.</li> <li>• <b>RIPv2 Updates Received</b>—Number of RIPv2 update messages received.</li> <li>• <b>RIPv2 Bad Route Entries</b>—Number of RIPv2 invalid route entry messages received.</li> <li>• <b>RIPv2 Updates Ignored</b>—Number of RIPv2 update messages that were ignored.</li> <li>• <b>Authentication Failures</b>—Number of received update messages that failed authentication.</li> <li>• <b>RIP Requests Received</b>—Number of RIP request messages received.</li> <li>• <b>RIP Requests Ignored</b>—Number of RIP request messages ignored.</li> </ul> |
| <b>Total</b>             | Total number of packets for the selected counter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Last 5 min</b>        | Number of packets for the selected counter in the most recent 5-minute period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Last minute</b>       | 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 186](#)  
                          [Syntax \(EX Series Switches\) on page 186](#)

**Syntax**    show route  
              <all>  
              <*destination-prefix*>  
              <logical-system (all | *logical-system-name*)>  
              <private>

**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.

**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 rpd client applications.

**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 190](#)
- [show route \(VPN\) on page 191](#)
- [show route \(with Destination Prefix\) on page 191](#)
- [show route destination-prefix detail on page 191](#)
- [show route extensive on page 191](#)
- [show route extensive \( ECMP\) on page 192](#)
- [show route \(Enhanced Subscriber Management\) on page 192](#)
- [show route \(IPv6 Flow Specification\) on page 192](#)
- [show route display-client-data detail on page 193](#)

**Output Fields** Table 13 on page 187 describes the output fields for the **show route** command. Output fields are listed in the approximate order in which they appear.

**Table 13: 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <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"> <li>• <b>active</b> (routes that are active).</li> <li>• <b>holddown</b> (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.</li> </ul> <p>However, if you have configured advertisement of multiple routes (with the <b>add-path</b> or <b>advertise-inactive</b> 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"> <li>• <b>hidden</b> (routes that are not used because of a routing policy).</li> </ul> |

Table 13: show route Output Fields (*continued*)

| Field Name                                  | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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"> <li>• <b>MPLS-label</b> (for example, 80001).</li> <li>• <b>interface-name</b> (for example, ge-1/0/2).</li> <li>• <b>neighbor-address:control-word-status:encapsulation type:vc-id:source</b> (Layer 2 circuit only. For example, 10.1.1.195:NoCtrlWord:1:1:Local/96): <ul style="list-style-type: none"> <li>• <b>neighbor-address</b>—Address of the neighbor.</li> <li>• <b>control-word-status</b>—Whether the use of the control word has been negotiated for this virtual circuit: <b>NoCtrlWord</b> or <b>CtrlWord</b>.</li> <li>• <b>encapsulation type</b>—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.</li> <li>• <b>vc-id</b>—Virtual circuit identifier.</li> <li>• <b>source</b>—Source of the advertisement: <b>Local</b> or <b>Remote</b>.</li> </ul> </li> </ul> |
| [ <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"> <li>• <b>+</b>—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table.</li> <li>• <b>-</b>—A hyphen indicates the last active route.</li> <li>• <b>*</b>—An asterisk indicates that the route is both the active and the last active route. An asterisk before a <b>to</b> line indicates the best subpath to the route.</li> </ul> <p>In every routing metric except for the BGP <b>LocalPref</b> attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the <b>LocalPref</b> value in the <b>Preference2</b> field. For example, if the <b>LocalPref</b> value for Route 1 is 100, the <b>Preference2</b> value is -101. If the <b>LocalPref</b> value for Route 2 is 155, the <b>Preference2</b> value is -156. Route 2 is preferred because it has a higher <b>LocalPref</b> value and a lower <b>Preference2</b> value.</p>                                                          |
| <i>weeks:days<br/>hours:minutes:seconds</i> | How long the route been known (for example, <b>2w4d 13:11:14</b> , or 2 weeks, 4 days, 13 hours, 11 minutes, and 14 seconds).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>metric</b>                               | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>localpref</b>                            | Local preference value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>from</b>                                 | Interface from which the route was received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Table 13: show route Output Fields (*continued*)

| Field Name              | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AS path</b>          | <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"> <li>• <b>I</b>—IGP.</li> <li>• <b>E</b>—EGP.</li> <li>• <b>?</b>—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li>• <b>[ ]</b>—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.</li> <li>• <b>{ }</b>—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.</li> <li>• <b>( )</b>—Parentheses enclose a confederation.</li> <li>• <b>( [ ] )</b>—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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> |
| <b>Route Labels</b>     | Stack of labels carried in the BGP route update.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>validation-state</b> | <p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> <li>• <b>Invalid</b>—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.</li> <li>• <b>Unknown</b>—Indicates that the prefix is not among the prefixes or prefix ranges in the database.</li> <li>• <b>Unverified</b>—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.</li> <li>• <b>Valid</b>—Indicates that the prefix and autonomous system pair are found in the database.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>to</b>               | <p>Next hop to the destination. An angle bracket (&gt;) indicates that the route is the selected route.</p> <p>If the destination is <b>Discard</b>, traffic is dropped.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 13: show route Output Fields (*continued*)

| Field Name             | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>via</b>             | <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 <b>Selected</b>. This field can also contain the following information:</p> <ul style="list-style-type: none"> <li>• <b>Weight</b>—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.</li> <li>• <b>Balance</b>—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.</li> <li>• <b>lsp-path-name</b>—Name of the LSP used to reach the next hop.</li> <li>• <b>label-action</b>—MPLS label and operation occurring at the next hop. The operation can be <b>pop</b> (where a label is removed from the top of the stack), <b>push</b> (where another label is added to the label stack), or <b>swap</b> (where a label is replaced by another label). For VPNs, expect to see multiple <b>push</b> 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).</li> </ul> |
| <b>Private unicast</b> | (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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>balance</b>         | 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
 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 (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 active-path

---

|                                    |                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 194</a><br><a href="#">Syntax (EX Series Switches) on page 194</a>                                                                                                                                                                                                                                                                                           |
| <b>Syntax</b>                      | <code>show route active-path</code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                |
| <b>Syntax (EX Series Switches)</b> | <code>show route active-path</code><br><code>&lt;brief   detail   extensive   terse&gt;</code>                                                                                                                                                                                                                                                                                          |
| <b>Release Information</b>         | Command introduced in Junos OS Release 8.0.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                       |
| <b>Description</b>                 | Display all active routes for destinations. An active route is a route that is selected as the best path. Inactive routes are not displayed.                                                                                                                                                                                                                                            |
| <b>Options</b>                     | <b>none</b> —Display all active routes.<br><br><b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b> .<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>List of Sample Output</b>       | <a href="#">show route active-path on page 194</a><br><a href="#">show route active-path brief on page 195</a><br><a href="#">show route active-path detail on page 195</a><br><a href="#">show route active-path extensive on page 196</a><br><a href="#">show route active-path terse on page 198</a>                                                                                 |
| <b>Output Fields</b>               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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 194](#).

### 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   |          |          | >1o0.0         |         |
| * | 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

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show route advertising-protocol <i>protocol neighbor-address</i><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>              | Display the routing information as it has been prepared for advertisement to a particular neighbor of a particular dynamic routing protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Options</b>                  | <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b><i>neighbor-address</i></b>—Address of the neighboring router to which the route entry is being transmitted.</p> <p><b><i>protocol</i></b>—Protocol transmitting the route:</p> <ul style="list-style-type: none"> <li>• <b>bgp</b>—Border Gateway Protocol</li> <li>• <b>dvmrp</b>—Distance Vector Multicast Routing Protocol</li> <li>• <b>msdp</b>—Multicast Source Discovery Protocol</li> <li>• <b>pim</b>—Protocol Independent Multicast</li> <li>• <b>rip</b>—Routing Information Protocol</li> <li>• <b>ripng</b>—Routing Information Protocol next generation</li> </ul> |
| <b>Additional Information</b>   | Routes displayed are routes that the routing table has exported into the routing protocol and that have been filtered by the associated protocol's <b>export</b> routing policy statements. Starting with Junos OS Release 13.3, you can display the routing instance table <b>foo</b> 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 <b>table</b> in the command, the output displays each VRF prefix twice.                                                                                                                                                                                                                                                                                                                                  |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Example: Configuring the MED Attribute That Determines the Exit Point in an AS</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>List of Sample Output</b>    | <a href="#">show route advertising-protocol bgp (Layer 3 VPN) on page 202</a><br><a href="#">show route advertising-protocol bgp detail on page 202</a><br><a href="#">show route advertising-protocol bgp detail (Labeled Unicast) on page 202</a><br><a href="#">show route advertising-protocol bgp detail (Layer 2 VPN) on page 203</a><br><a href="#">show route advertising-protocol bgp detail (Layer 3 VPN) on page 203</a>                                                                                                                                                                                                                                                                                                                                                                                                                    |

[show route advertising-protocol bgp extensive all \(Next Hop Self with RIB-out IP Address\)](#) on page 203

**Output Fields** [Table 14 on page 200](#) lists the output fields for the **show route advertising-protocol** command. Output fields are listed in the approximate order in which they appear.

**Table 14: 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"> <li>• <b>active</b> (routes that are active)</li> <li>• <b>holddown</b> (routes that are in the pending state before being declared inactive)</li> <li>• <b>hidden</b> (routes that are not used because of a routing policy)</li> </ul>                                                               | All levels              |
| <b>Prefix</b>                                | Destination prefix.                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>brief none</b>       |
| <i>destination-prefix (entry, announced)</i> | Destination prefix. The <b>entry</b> value is the number of routes for this destination, and the <b>announced</b> value is the number of routes being announced for this destination.                                                                                                                                                                                                                                               | <b>detail extensive</b> |
| <b>BGP group and type</b>                    | BGP group name and type ( <b>Internal</b> or <b>External</b> ).                                                                                                                                                                                                                                                                                                                                                                     | <b>detail extensive</b> |
| <b>Route Distinguisher</b>                   | Unique 64-bit prefix augmenting each IP subnet.                                                                                                                                                                                                                                                                                                                                                                                     | <b>detail extensive</b> |
| <b>Advertised Label</b>                      | 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. | <b>detail extensive</b> |
| <b>Label-Base, range</b>                     | 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.                                                                                                                                                                                                                                                                              | <b>detail extensive</b> |
| <b>VPN Label</b>                             | 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.                                                                                                                                                                           | <b>detail extensive</b> |
| <b>Nexthop</b>                               | Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.<br><br>If the next-hop advertisement to the peer is <b>Self</b> , and the RIB-out next hop is a specific IP address, the RIB-out IP address is included in the extensive output. See <a href="#">show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address)</a> on page 203.                       | All levels              |

Table 14: show route advertising-protocol Output Fields (*continued*)

| Field Name                  | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Level of Output                |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>MED</b>                  | Multiple exit discriminator value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>brief</b>                   |
| <b>Lclpref or Localpref</b> | Local preference value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | All levels                     |
| <b>Queued</b>               | 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 <b>brief</b> |
| <b>AS path</b>              | <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"> <li>• <b>I</b>—IGP.</li> <li>• <b>E</b>—EGP.</li> <li>• <b>?</b>—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li>• <b>[ ]</b>—Brackets enclose the local AS number associated with the AS path if configured on the router, or if AS path prepending is configured.</li> <li>• <b>{ }</b>—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.</li> <li>• <b>( )</b>—Parentheses enclose a confederation.</li> <li>• <b>( [ ] )</b>—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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                     |
| <b>Route Labels</b>         | Stack of labels carried in the BGP route update.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail extensive</b>        |
| <b>Cluster list</b>         | (For route reflected output only) Cluster ID sent by the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>detail extensive</b>        |
| <b>Originator ID</b>        | (For route reflected output only) Address of routing device that originally sent the route to the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>detail extensive</b>        |
| <b>Communities</b>          | Community path attribute for the route. See the output field table for the <a href="#">show route detail</a> command for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>detail extensive</b>        |
| <b>AIGP</b>                 | Accumulated interior gateway protocol (AIGP) BGP attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>detail extensive</b>        |
| <b>Attrset AS</b>           | Number, local preference, and path of the autonomous system (AS) that originated the route. These values are stored in the <b>Attrset</b> attribute at the originating router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>detail extensive</b>        |
| <b>Layer2-info:encaps</b>   | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>detail extensive</b>        |
| <b>control flags</b>        | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail extensive</b>        |
| <b>mtu</b>                  | Maximum transmission unit (MTU) of the Layer 2 circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>detail extensive</b>        |

## 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 (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.12vpn.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              | <a href="#">Syntax on page 204</a><br><a href="#">Syntax (EX Series Switches) on page 204</a>                                                                                                                                                                                                                                                 |
| Syntax                      | show route all<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                        |
| Syntax (EX Series Switches) | show route all                                                                                                                                                                                                                                                                                                                                |
| Release Information         | Command introduced before Junos OS Release 7.4.<br>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                     | <b>none</b> —Display information about all routes in all routing tables, including private, or internal, tables.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(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"><li>• <a href="#">show route brief on page 209</a></li><li>• <a href="#">show route detail on page 211</a></li></ul>                                                                                                                                                                                        |
| List of Sample Output       | <a href="#">show route all on page 204</a>                                                                                                                                                                                                                                                                                                    |
| Output Fields               | In Junos OS Release 9.5 and later, only the output fields for the <b>show route all</b> command display all routing tables, including private, or hidden, routing tables. The output field table of the <a href="#">show route</a> 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              | <a href="#">Syntax on page 206</a><br><a href="#">Syntax (EX Series Switches) on page 206</a>                                                                                                                                                                                                                                                                                                                    |
| Syntax                      | <code>show route best <i>destination-prefix</i></code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                      |
| Syntax (EX Series Switches) | <code>show route best <i>destination-prefix</i></code><br><code>&lt;brief   detail   extensive   terse&gt;</code>                                                                                                                                                                                                                                                                                                |
| Release Information         | Command introduced before Junos OS Release 7.4.<br>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                     | <b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b> .<br><br><b><i>destination-prefix</i></b> —Address or range of addresses.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(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"><li>• <a href="#">show route brief on page 209</a></li><li>• <a href="#">show route detail on page 211</a></li></ul>                                                                                                                                                                                                                                                           |
| List of Sample Output       | <a href="#">show route best on page 206</a><br><a href="#">show route best detail on page 207</a><br><a href="#">show route best extensive on page 208</a><br><a href="#">show route best terse on page 208</a>                                                                                                                                                                                                  |
| Output Fields               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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 207](#).

### 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 >fxp2.0
 D 0 >fxp1.0
```

## show route brief

|                                    |                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 209</a><br><a href="#">Syntax (EX Series Switches) on page 209</a>                                                                                                                                                                                                                                            |
| <b>Syntax</b>                      | show route brief<br><destination-prefix><br><logical-system (all   logical-system-name)>                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switches)</b> | show route brief<br><destination-prefix>                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                    |
| <b>Description</b>                 | Display brief information about the active entries in the routing tables.                                                                                                                                                                                                                                                                |
| <b>Options</b>                     | <b>none</b> —Display all active entries in the routing table.<br><br><b>destination-prefix</b> —(Optional) Display active entries for the specified address or range of addresses.<br><br><b>logical-system (all   logical-system-name)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>       | <ul style="list-style-type: none"> <li>• <a href="#">show route all on page 204</a></li> <li>• <a href="#">show route best on page 206</a></li> </ul>                                                                                                                                                                                    |
| <b>List of Sample Output</b>       | <a href="#">show route brief on page 209</a>                                                                                                                                                                                                                                                                                             |
| <b>Output Fields</b>               | For information about output fields, see the Output Field table of the <a href="#">show route</a> 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 lo0.0
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

|                                    |                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 211</a><br><a href="#">Syntax (EX Series Switches) on page 211</a>                                                                                                                                                                                                                                                               |
| <b>Syntax</b>                      | show route detail<br><destination-prefix><br><logical-system (all   logical-system-name)>                                                                                                                                                                                                                                                                   |
| <b>Syntax (EX Series Switches)</b> | show route detail<br><destination-prefix>                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                   |
| <b>Description</b>                 | Display detailed information about the active entries in the routing tables.                                                                                                                                                                                                                                                                                |
| <b>Options</b>                     | <p><b>none</b>—Display all active entries in the routing table on all systems.</p> <p><b>destination-prefix</b>—(Optional) Display active entries for the specified address or range of addresses.</p> <p><b>logical-system (all   logical-system-name)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                        |
| <b>List of Sample Output</b>       | <a href="#">show route detail on page 222</a><br><a href="#">show route detail (with BGP Multipath) on page 228</a><br><a href="#">show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 229</a><br><a href="#">show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 229</a>          |
| <b>Output Fields</b>               | <a href="#">Table 15 on page 211</a> describes the output fields for the <b>show route detail</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                          |

**Table 15: 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.                                                                                                                                                                                                                                                                                         |
| <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"> <li><b>active</b> (routes that are active)</li> <li><b>holddown</b> (routes that are in the pending state before being declared inactive)</li> <li><b>hidden</b> (routes that are not used because of a routing policy)</li> </ul> |

Table 15: show route detail Output Fields (*continued*)

| Field Name                                                   | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>route-destination</i></b><br><b>(entry, announced)</b> | <p>Route destination (for example:10.0.0.1/24). The <b>entry</b> value is the number of routes for this destination, and the <b>announced</b> 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"> <li>• <b><i>MPLS-label</i></b> (for example, 80001).</li> <li>• <b><i>interface-name</i></b> (for example, ge-1/0/2).</li> <li>• <b><i>neighbor-address:control-word-status:encapsulation type:vc-id:source</i></b> (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> <li>• <b><i>neighbor-address</i></b>—Address of the neighbor.</li> <li>• <b><i>control-word-status</i></b>—Whether the use of the control word has been negotiated for this virtual circuit: <b>NoCtrlWord</b> or <b>CtrlWord</b>.</li> <li>• <b><i>encapsulation type</i></b>—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.</li> <li>• <b><i>vc-id</i></b>—Virtual circuit identifier.</li> <li>• <b><i>source</i></b>—Source of the advertisement: <b>Local</b> or <b>Remote</b>.</li> <li>• <b><i>source</i></b>—Source of the advertisement: <b>Local</b> or <b>Remote</b>.</li> </ul> </li> </ul> |
| <b>label stacking</b>                                        | <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"> <li>• <b>S=0 route</b> 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).</li> <li>• If there is no <b>S=</b> information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 15: show route detail Output Fields (*continued*)

| Field Name                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>[protocol, preference]</b> | <p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> <li>• <b>+</b>—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table.</li> <li>• <b>-</b>—A hyphen indicates the last active route.</li> <li>• <b>*</b>—An asterisk indicates that the route is both the active and the last active route. An asterisk before a <b>to</b> line indicates the best subpath to the route.</li> </ul> <p>In every routing metric except for the BGP <b>LocalPref</b> attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the <b>LocalPref</b> value in the <b>Preference2</b> field. For example, if the <b>LocalPref</b> value for Route 1 is 100, the <b>Preference2</b> value is -101. If the <b>LocalPref</b> value for Route 2 is 155, the <b>Preference2</b> value is -156. Route 2 is preferred because it has a higher <b>LocalPref</b> value.</p> <p><b>Preference2</b> values are signed integers, that is, <b>Preference2</b> values can be either positive or negative values. However, Junos OS evaluates <b>Preference2</b> values as unsigned integers that are represented by positive values. Based on the <b>Preference2</b> values, Junos OS evaluates a preferred route differently in the following scenarios:</p> <ul style="list-style-type: none"> <li>• <b>Both Signed Preference2 values</b> <ul style="list-style-type: none"> <li>• Route A = -101</li> <li>• Route B = -156</li> </ul> <p>Where both the <b>Preference2</b> values are signed, Junos OS evaluates only the unsigned value of <b>Preference2</b> and Route A, which has a lower <b>Preference2</b> value is preferred.</p> </li> <li>• <b>Unsigned Preference2 values</b> <p>Now consider both unsigned <b>Preference2</b> values:</p> <ul style="list-style-type: none"> <li>• Route A = 4294967096</li> <li>• Route B = 200</li> </ul> <p>Here, Junos OS considers the lesser <b>Preference2</b> value and Route B with a <b>Preference2</b> value of 200 is preferred because it is less than 4294967096.</p> </li> <li>• <b>Combination of signed and unsigned Preference2 values</b> <p>When <b>Preference2</b> values of two routes are compared, and for one route the <b>Preference2</b> is a signed value, and for the other route it is an unsigned value, Junos OS prefers the route with the positive <b>Preference2</b> value over the negative <b>Preference2</b> value. For example, consider the following signed and unsigned <b>Preference2</b> values:</p> <ul style="list-style-type: none"> <li>• Route A = -200</li> <li>• Route B = 200</li> </ul> <p>In this case, Route B with a <b>Preference2</b> value of 200 is preferred although this value is greater than -200, because Junos OS evaluates only the unsigned value of the <b>Preference2</b> value.</p> </li> </ul> |
| <b>Level</b>                  | (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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Route Distinguisher</b>    | IP subnet augmented with a 64-bit prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>PMSI</b>                   | Provider multicast service interface (MVPN routing table).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 15: show route detail Output Fields (*continued*)

| Field Name                                           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Next-hop type</b>                                 | Type of next hop. For a description of possible values for this field, see <a href="#">Table 16 on page 217</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Next-hop reference count</b>                      | Number of references made to the next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Flood nexthop branches exceed maximum message</b> | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Source</b>                                        | IP address of the route source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Next hop</b>                                      | Network layer address of the directly reachable neighboring system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>via</b>                                           | <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 <b>Selected</b>. This field can also contain the following information:</p> <ul style="list-style-type: none"> <li>• <b>Weight</b>—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.</li> <li>• <b>Balance</b>—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.</li> </ul> |
| <b>Label-switched-path<br/>lsp-path-name</b>         | Name of the LSP used to reach the next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Label operation</b>                               | MPLS label and operation occurring at this routing device. The operation can be <b>pop</b> (where a label is removed from the top of the stack), <b>push</b> (where another label is added to the label stack), or <b>swap</b> (where a label is replaced by another label).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Interface</b>                                     | (Local only) Local interface name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Protocol next hop</b>                             | Network layer address of the remote routing device that advertised the prefix. This address is used to derive a forwarding next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Indirect next hop</b>                             | Index designation used to specify the mapping between protocol next hops, tags, kernel export policy, and the forwarding next hops.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>State</b>                                         | State of the route (a route can be in more than one state). See <a href="#">Table 17 on page 219</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Local AS</b>                                      | AS number of the local routing device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Age</b>                                           | How long the route has been known.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>AIGP</b>                                          | Accumulated interior gateway protocol (AIGP) BGP attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



Table 15: show route detail Output Fields (*continued*)

| Field Name               | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Metric</b>            | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>MED-plus-IGP</b>      | Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>TTL-Action</b>        | 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.<br><br>For sample output, see <a href="#">show route table</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Task</b>              | Name of the protocol that has added the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Announcement bits</b> | 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, <b>n-Resolve inet</b> indicates that the specified route is used for route resolution for next hops found in the routing table.<br><br><ul style="list-style-type: none"> <li><b>n</b>—An index used by Juniper Networks customer support only.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>AS path</b>           | <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"> <li><b>I</b>—IGP.</li> <li><b>E</b>—EGP.</li> <li><b>Recorded</b>—The AS path is recorded by the sample process (sampled).</li> <li><b>?</b>—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li><b>[ ]</b>—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.</li> <li><b>[ ]</b>—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.</li> <li><b>{ }</b>—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.</li> <li><b>( )</b>—Parentheses enclose a confederation.</li> <li><b>( [ ] )</b>—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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 15: show route detail Output Fields (*continued*)

| Field Name              | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>validation-state</b> | <p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> <li>• <b>Invalid</b>—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.</li> <li>• <b>Unknown</b>—Indicates that the prefix is not among the prefixes or prefix ranges in the database.</li> <li>• <b>Unverified</b>—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.</li> <li>• <b>Valid</b>—Indicates that the prefix and autonomous system pair are found in the database.</li> </ul> |
| 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 <a href="#">Table 18 on page 221</a> for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Layer2-info: encaps     | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| control flags           | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| mtu                     | Maximum transmission unit (MTU) information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Table 15: show route detail Output Fields (*continued*)

| Field Name                                 | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Label-Base, range</b>                   | 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.                                                                                                                                                                                                                                                                                                               |
| <b>status vector</b>                       | Layer 2 VPN and VPLS network layer reachability information (NLRI).                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Accepted Multipath</b>                  | Current active path when BGP multipath is configured.                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Accepted LongLivedStale</b>             | 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.                                                                                                                                                                  |
| <b>Accepted LongLivedStaleImport</b>       | <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> |
| <b>ImportAccepted LongLivedStaleImport</b> | <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>                                                                                                                                                                      |
| <b>Accepted MultipathContrib</b>           | Path currently contributing to BGP multipath.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Localpref</b>                           | Local preference value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Router ID</b>                           | BGP router ID as advertised by the neighbor in the open message.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Primary Routing Table</b>               | In a routing table group, the name of the primary routing table in which the route resides.                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Secondary Tables</b>                    | In a routing table group, the name of one or more secondary tables in which the route resides.                                                                                                                                                                                                                                                                                                                                                                                       |

[Table 16 on page 217](#) describes all possible values for the Next-hop Types output field.

Table 16: Next-hop Types Output Field Values

| Next-Hop Type            | Description         |
|--------------------------|---------------------|
| <b>Broadcast (bcast)</b> | Broadcast next hop. |
| <b>Deny</b>              | Deny next hop.      |
| <b>Discard</b>           | Discard next hop.   |

Table 16: Next-hop Types Output Field Values (*continued*)

| Next-Hop Type                   | Description                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flood</b>                    | 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.                                                                                                                             |
| <b>Hold</b>                     | Next hop is waiting to be resolved into a unicast or multicast type.                                                                                                                                                                                                                                                                                                                                       |
| <b>Indexed (idxd)</b>           | Indexed next hop.                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Indirect (indr)</b>          | 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.                                                                                                                                                                               |
| <b>Interface</b>                | 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.                                                                                                                                                                                                                                               |
| <b>Local (locl)</b>             | Local address on an interface. This next-hop type causes packets with this destination address to be received locally.                                                                                                                                                                                                                                                                                     |
| <b>Multicast (mcst)</b>         | Wire multicast next hop (limited to the LAN).                                                                                                                                                                                                                                                                                                                                                              |
| <b>Multicast discard (mdsc)</b> | Multicast discard.                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Multicast group (mgrp)</b>   | Multicast group member.                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Receive (recv)</b>           | Receive.                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Reject (rjct)</b>            | Discard. An ICMP unreachable message was sent.                                                                                                                                                                                                                                                                                                                                                             |
| <b>Resolve (rslv)</b>           | Resolving next hop.                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Routed multicast (mcrt)</b>  | Regular multicast next hop.                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Router</b>                   | <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"> <li>• Must not be a direct or local subnet for the routing device.</li> <li>• Must have a next hop that is directly connected to the routing device.</li> </ul> |
| <b>Table</b>                    | Routing table next hop.                                                                                                                                                                                                                                                                                                                                                                                    |

Table 16: 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 17 on page 219 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 17: 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 17: State Output Field Values (*continued*)

| Value                                                    | Description                                                                   |
|----------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Int</b>                                               | Interior route.                                                               |
| <b>Int Ext</b>                                           | BGP route received from an internal BGP peer or a BGP confederation peer.     |
| <b>Interior &gt; Exterior &gt; Exterior via Interior</b> | Direct, static, IGP, or EBGp path is available.                               |
| <b>Local Preference</b>                                  | Path with a higher local preference value is available.                       |
| <b>Martian</b>                                           | Route is a martian (ignored because it is obviously invalid).                 |
| <b>MartianOK</b>                                         | Route exempt from martian filtering.                                          |
| <b>Next hop address</b>                                  | Path with lower metric next hop is available.                                 |
| <b>No difference</b>                                     | Path from neighbor with lower IP address is available.                        |
| <b>NoReadvrt</b>                                         | Route not to be advertised.                                                   |
| <b>NotBest</b>                                           | Route not chosen because it does not have the lowest MED.                     |
| <b>Not Best in its group</b>                             | Incoming BGP AS is not the best of a group (only one AS can be the best).     |
| <b>NotInstall</b>                                        | Route not to be installed in the forwarding table.                            |
| <b>Number of gateways</b>                                | Path with a greater number of next hops is available.                         |
| <b>Origin</b>                                            | Path with a lower origin code is available.                                   |
| <b>Pending</b>                                           | Route pending because of a hold-down configured on another route.             |
| <b>Programmed</b>                                        | Route installed programmatically by on-box or off-box applications using API. |
| <b>Release</b>                                           | Route scheduled for release.                                                  |
| <b>RIB preference</b>                                    | Route from a higher-numbered routing table is available.                      |
| <b>Route Distinguisher</b>                               | 64-bit prefix added to IP subnets to make them unique.                        |
| <b>Route Metric or MED comparison</b>                    | Route with a lower metric or MED is available.                                |
| <b>Route Preference</b>                                  | Route with lower preference value is available                                |
| <b>Router ID</b>                                         | Path through a neighbor with lower ID is available.                           |

Table 17: State Output Field Values (*continued*)

| Value                | Description                                                                                                                                                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Secondary</b>     | Route not a primary route.                                                                                                                                                                                                        |
| <b>Unusable path</b> | Path is not usable because of one of the following conditions: <ul style="list-style-type: none"> <li>• The route is damped.</li> <li>• The route is rejected by an import policy.</li> <li>• The route is unresolved.</li> </ul> |
| <b>Update source</b> | Last tiebreaker is the lowest IP address value.                                                                                                                                                                                   |

Table 18 on page 221 describes the possible values for the Communities output field.

Table 18: 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 <b>0</b> . 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.                                                  |
| <b>bandwidth: local AS number:link-bandwidth-number</b> | 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.                   |
| <b>domain-id</b>                                        | Unique configurable number that identifies the OSPF domain.                                                                                                                                                                                                                                             |
| <b>domain-id-vendor</b>                                 | Unique configurable number that further identifies the OSPF domain.                                                                                                                                                                                                                                     |
| <i>link-bandwidth-number</i>                            | Link-bandwidth number: from <b>0</b> through <b>4,294,967,295</b> (bytes per second).                                                                                                                                                                                                                   |
| <i>local AS number</i>                                  | Local AS number: from <b>1</b> through <b>65,535</b> .                                                                                                                                                                                                                                                  |
| <i>options</i>                                          | 1 byte. Currently this is only used if the route type is <b>5</b> or <b>7</b> . Setting the least significant bit in the field indicates that the route carries a type 2 metric.                                                                                                                        |
| <b>origin</b>                                           | (Used with VPNs) Identifies where the route came from.                                                                                                                                                                                                                                                  |
| <i>ospf-route-type</i>                                  | 1 byte, encoded as <b>1</b> or <b>2</b> for intra-area routes (depending on whether the route came from a type 1 or a type 2 LSA); <b>3</b> for summary routes; <b>5</b> for external routes (area number must be <b>0</b> ); <b>7</b> for NSSA routes; or <b>129</b> for sham link endpoint addresses. |
| <b>route-type-vendor</b>                                | Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute <b>0x8000</b> . The format is <i>area-number:ospf-route-type:options</i> .                                                                                            |
| <b>rte-type</b>                                         | Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute <b>0x0306</b> . The format is <i>area-number:ospf-route-type:options</i> .                                                                                            |

Table 18: Communities Output Field Values (*continued*)

| Value                                | Description                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>target</b>                        | Defines which VPN the route participates in; <b>target</b> has the format <b>32-bit IP address:16-bit number</b> . For example, 10.19.0.0:100.    |
| <b>unknown IANA</b>                  | 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. |
| <b>unknown OSPF vendor community</b> | 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-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: 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: 0xfffe
 ge-1/2/19.0, 1.3.6.1, Label: 301584, weight: 0xfffe
```



## show route exact

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 231</a><br><a href="#">Syntax (EX Series Switches) on page 231</a>                                                                                                                                                                                                                                                                                                             |
| <b>Syntax</b>                      | <b>show route exact</b> <i>destination-prefix</i><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                         |
| <b>Syntax (EX Series Switches)</b> | <b>show route exact</b> <i>destination-prefix</i><br><brief   detail   extensive   terse>                                                                                                                                                                                                                                                                                                                 |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                 | Display only the routes that exactly match the specified address or range of addresses.                                                                                                                                                                                                                                                                                                                   |
| <b>Options</b>                     | <b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b> .<br><br><b>destination-prefix</b> —Address or range of addresses.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>       | <a href="#">show route exact on page 231</a><br><a href="#">show route exact detail on page 231</a><br><a href="#">show route exact extensive on page 232</a><br><a href="#">show route exact terse on page 232</a>                                                                                                                                                                                       |
| <b>Output Fields</b>               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 233</a><br><a href="#">Syntax (EX Series Switches) on page 233</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax</b>                      | <pre>show route export &lt;brief   detail&gt; &lt;instance &lt;instance-name&gt;   routing-table-name&gt; &lt;logical-system (all   logical-system-name)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (EX Series Switches)</b> | <pre>show route export &lt;brief   detail&gt; &lt;instance &lt;instance-name&gt;   routing-table-name&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>         | <p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>                 | Display policy-based route export information. Policy-based export simplifies the process of exchanging route information between routing instances.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                     | <p><b>none</b>—(Same as <b>brief</b>.) Display standard information about policy-based export for all instances and routing tables on all systems.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p><b>instance &lt;instance-name&gt;</b>—(Optional) Display a particular routing instance for which policy-based export is currently enabled.</p> <p><b>logical-system (all   logical-system-name)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b>routing-table-name</b>—(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 <b>show route export inet</b> command).</p> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>List of Sample Output</b>       | <a href="#">show route export on page 234</a><br><a href="#">show route export detail on page 234</a><br><a href="#">show route export instance detail on page 234</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Output Fields</b>               | <a href="#">Table 19 on page 233</a> lists the output fields for the <b>show route export</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Table 19: 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. | <b>brief</b> none |

Table 19: show route export Output Fields (*continued*)

| Field Name    | Field Description                                                                                                                                                                                                                                                                                                                                                           | Level of Output   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Export        | Whether the table is currently exporting routes to other tables: <b>Y</b> or <b>N</b> (Yes or No).                                                                                                                                                                                                                                                                          | <b>brief</b> none |
| Import        | Tables currently importing routes from the originator table. (Not displayed for tables that are not exporting any routes.)                                                                                                                                                                                                                                                  | <b>detail</b>     |
| Flags         | ( <b>instance</b> keyword only) Flags for this feature on this instance: <ul style="list-style-type: none"> <li><b>config auto-policy</b>—The policy was deduced from the configured IGP export policies.</li> <li><b>cleanup</b>—Configuration information for this instance is no longer valid.</li> <li><b>config</b>—The instance was explicitly configured.</li> </ul> | <b>detail</b>     |
| Options       | ( <b>instance</b> keyword only) Configured option displays the type of routing tables the feature handles: <ul style="list-style-type: none"> <li><b>unicast</b>—Indicates <i>instance.inet.0</i>.</li> <li><b>multicast</b>—Indicates <i>instance.inet.2</i>.</li> <li><b>unicast multicast</b>—Indicates <i>instance.inet.0</i> and <i>instance.inet.2</i>.</li> </ul>    | <b>detail</b>     |
| Import policy | ( <b>instance</b> keyword only) Policy that <b>route export</b> uses to construct the import-export matrix. Not displayed if the instance type is <b>vrf</b> .                                                                                                                                                                                                              | <b>detail</b>     |
| Instance      | ( <b>instance</b> keyword only) Name of the routing instance.                                                                                                                                                                                                                                                                                                               | <b>detail</b>     |
| Type          | ( <b>instance</b> keyword only) Type of routing instance: <b>forwarding</b> , <b>non-forwarding</b> , or <b>vrf</b> .                                                                                                                                                                                                                                                       | <b>detail</b>     |

## 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  
Instance: red

Type: non-forwarding  
Type: non-forwarding

## show route extensive

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 236</a><br><a href="#">Syntax (EX Series Switches) on page 236</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Syntax</b>                      | show route extensive<br><destination-prefix><br><logical-system (all   logical-system-name)>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (EX Series Switches)</b> | show route extensive<br><destination-prefix>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                 | Display extensive information about the active entries in the routing tables.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                     | <b>none</b> —Display all active entries in the routing table.<br><br><b>destination-prefix</b> —(Optional) Display active entries for the specified address or range of addresses.<br><br><b>logical-system (all   logical-system-name)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.                                                                                                                                                                                                                                                                                  |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>       | <a href="#">show route extensive on page 243</a><br><a href="#">show route extensive (Access Route) on page 250</a><br><a href="#">show route extensive (BGP PIC Edge) on page 250</a><br><a href="#">show route extensive (FRR and LFA) on page 251</a><br><a href="#">show route extensive (IS-IS) on page 252</a><br><a href="#">show route extensive (Route Reflector) on page 252</a><br><a href="#">show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 252</a><br><a href="#">show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 253</a> |
| <b>Output Fields</b>               | <a href="#">Table 20 on page 236</a> describes the output fields for the <b>show route extensive</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 20: 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 20: 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"> <li>• <b>active</b> (routes that are active).</li> <li>• <b>holddown</b> (routes that are in the pending state before being declared inactive).</li> <li>• <b>hidden</b> (routes that are not used because of a routing policy).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>route-destination</i><br>(entry, announced) | <p>Route destination (for example: 10.0.0.1/24). The <b>entry</b> value is the number of route for this destination, and the <b>announced</b> 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"> <li>• <b>MPLS-label</b> (for example, 80001).</li> <li>• <b>interface-name</b> (for example, ge-1/0/2).</li> <li>• <b>neighbor-address:control-word-status:encapsulation type:vc-id:source</b> (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> <li>• <b>neighbor-address</b>—Address of the neighbor.</li> <li>• <b>control-word-status</b>—Whether the use of the control word has been negotiated for this virtual circuit: <b>NoCtrlWord</b> or <b>CtrlWord</b>.</li> <li>• <b>encapsulation type</b>—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.</li> <li>• <b>vc-id</b>—Virtual circuit identifier.</li> <li>• <b>source</b>—Source of the advertisement: <b>Local</b> or <b>Remote</b>.</li> </ul> </li> </ul> |
| <b>TSI</b>                                     | Protocol header information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>label stacking</b>                          | <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"> <li>• <b>S=0 route</b> 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).</li> <li>• If there is no <b>S=</b> information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>[protocol, preference]</b>                  | <p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> <li>• <b>+—</b>A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table.</li> <li>• <b>—</b>A hyphen indicates the last active route.</li> <li>• <b>*—</b>An asterisk indicates that the route is both the active and the last active route. An asterisk before a <b>to</b> line indicates the best subpath to the route.</li> </ul> <p>In every routing metric except for the BGP <b>LocalPref</b> attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the <b>LocalPref</b> value in the <b>Preference2</b> field. For example, if the <b>LocalPref</b> value for Route 1 is 100, the <b>Preference2</b> value is -101. If the <b>LocalPref</b> value for Route 2 is 155, the <b>Preference2</b> value is -156. Route 2 is preferred because it has a higher <b>LocalPref</b> value and a lower <b>Preference2</b> value.</p>                                                                                                                                                                                                                             |

Table 20: show route extensive Output Fields (*continued*)

| Field Name                                           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Level</b>                                         | (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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Route Distinguisher</b>                           | IP subnet augmented with a 64-bit prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PMSI</b>                                          | Provider multicast service interface (MVPN routing table).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Next-hop type</b>                                 | Type of next hop. For a description of possible values for this field, see the Output Field table in the <a href="#">show route detail</a> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Next-hop reference count</b>                      | Number of references made to the next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Flood nexthop branches exceed maximum message</b> | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Source</b>                                        | IP address of the route source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Next hop</b>                                      | Network layer address of the directly reachable neighboring system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>via</b>                                           | <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 <b>Selected</b>. This field can also contain the following information:</p> <ul style="list-style-type: none"> <li>• <b>Weight</b>—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.</li> <li>• <b>Balance</b>—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.</li> </ul> |
| <b>Label-switched-path<br/>lsp-path-name</b>         | Name of the LSP used to reach the next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Label operation</b>                               | MPLS label and operation occurring at this routing device. The operation can be <b>pop</b> (where a label is removed from the top of the stack), <b>push</b> (where another label is added to the label stack), or <b>swap</b> (where a label is replaced by another label).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Offset</b>                                        | Whether the metric has been increased or decreased by an offset value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Interface</b>                                     | (Local only) Local interface name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Protocol next hop</b>                             | Network layer address of the remote routing device that advertised the prefix. This address is used to recursively derive a forwarding next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



Table 20: show route extensive Output Fields (*continued*)

| Field Name                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>label-operation</i></b> | MPLS label and operation occurring at this routing device. The operation can be <b>pop</b> (where a label is removed from the top of the stack), <b>push</b> (where another label is added to the label stack), or <b>swap</b> (where a label is replaced by another label).                                                                                                                                                                                                                                                 |
| <b>Indirect next hops</b>     | <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 <b>Indirect next hop: weight</b> 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"> <li>• 0x1 indicates active next hops.</li> <li>• 0x4000 indicates passive next hops.</li> </ul> |
| <b>State</b>                  | State of the route (a route can be in more than one state). See the Output Field table in the <a href="#">show route detail</a> command.                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Session ID</b>             | The BFD session ID number that represents the protection using MPLS fast reroute (FRR) and loop-free alternate (LFA).                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Weight</b>                 | <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 <a href="#">show route table</a>.</p>                                                                                                                                                                                                                                                                                                                                     |

Table 20: 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"> <li>• <b>Active preferred</b>—Currently active route was selected over this route.</li> <li>• <b>Always compare MED</b>—Path with a lower multiple exit discriminator (MED) is available.</li> <li>• <b>AS path</b>—Shorter AS path is available.</li> <li>• <b>Cisco Non-deterministic MED selection</b>—Cisco nondeterministic MED is enabled and a path with a lower MED is available.</li> <li>• <b>Cluster list length</b>—Path with a shorter cluster list length is available.</li> <li>• <b>Forwarding use only</b>—Path is only available for forwarding purposes.</li> <li>• <b>IGP metric</b>—Path through the next hop with a lower IGP metric is available.</li> <li>• <b>IGP metric type</b>—Path with a lower OSPF link-state advertisement type is available.</li> <li>• <b>Interior &gt; Exterior &gt; Exterior via Interior</b>—Direct, static, IGP, or EBGP path is available.</li> <li>• <b>Local preference</b>—Path with a higher local preference value is available.</li> <li>• <b>Next hop address</b>—Path with a lower metric next hop is available.</li> <li>• <b>No difference</b>—Path from a neighbor with a lower IP address is available.</li> <li>• <b>Not Best in its group</b>—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).</li> <li>• <b>Number of gateways</b>—Path with a higher number of next hops is available.</li> <li>• <b>Origin</b>—Path with a lower origin code is available.</li> <li>• <b>OSPF version</b>—Path does not support the indicated OSPF version.</li> <li>• <b>RIB preference</b>—Route from a higher-numbered routing table is available.</li> <li>• <b>Route distinguisher</b>—64-bit prefix added to IP subnets to make them unique.</li> <li>• <b>Route metric or MED comparison</b>—Route with a lower metric or MED is available.</li> <li>• <b>Route preference</b>—Route with a lower preference value is available.</li> <li>• <b>Router ID</b>—Path through a neighbor with a lower ID is available.</li> <li>• <b>Unusable path</b>—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.</li> <li>• <b>Update source</b>—Last tiebreaker is the lowest IP address value.</li> </ul> |
| 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 <a href="#">show route table</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 20: show route extensive Output Fields (*continued*)

| Field Name                           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Task</b>                          | Name of the protocol that has added the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Announcement bits</b>             | List of protocols that announce this route. <b>n-Resolve inet</b> indicates that the route is used for route resolution for next hops found in the routing table. <b>n</b> is an index used by Juniper Networks customer support only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>AS path</b>                       | <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"> <li>• <b>I</b>—IGP.</li> <li>• <b>E</b>—EGP.</li> <li>• <b>Recorded</b>—The AS path is recorded by the sample process (sampled).</li> <li>• <b>?</b>—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li>• <b>[ ]</b>—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.</li> <li>• <b>{ }</b>—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.</li> <li>• <b>( )</b>—Parentheses enclose a confederation.</li> <li>• <b>( [ ] )</b>—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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> |
| <b>validation-state</b>              | <p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> <li>• <b>Invalid</b>—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.</li> <li>• <b>Unknown</b>—Indicates that the prefix is not among the prefixes or prefix ranges in the database.</li> <li>• <b>Unverified</b>—Indicates that origin validation is not enabled for the BGP peers.</li> <li>• <b>Valid</b>—Indicates that the prefix and autonomous system pair are found in the database.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>FECs bound to route</b>           | Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>AS path: I &lt;Originator&gt;</b> | (For route reflected output only) Originator ID attribute set by the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table 20: show route extensive Output Fields (*continued*)

| Field Name              | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>route status</b>     | <p>Indicates the status of a BGP route:</p> <ul style="list-style-type: none"> <li>• <b>Accepted</b>—The specified BGP route is imported by the default BGP policy.</li> <li>• <b>Import</b>—The route is imported into a Layer 3 VPN routing instance.</li> <li>• <b>Import-Protect</b>—A remote instance egress that is protected.</li> <li>• <b>Multipath</b>—A BGP multipath active route.</li> <li>• <b>MultipathContrib</b>—The route is not active but contributes to the BGP multipath.</li> <li>• <b>Protect</b>—An egress route that is protected.</li> <li>• <b>Stale</b>—A route that is marked stale due to graceful restart.</li> </ul> |
| 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 <a href="#">show route detail</a> command for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Layer2-info: encaps     | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| control flags           | Control flags: <b>none</b> 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 20: show route extensive Output Fields (*continued*)

| Field Name                   | Field Description                                                                                                                                                                                                                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>status vector</b>         | Layer 2 VPN and VPLS network layer reachability information (NLRI).                                                                                                                                                                                                                                              |
| <b>Localpref</b>             | Local preference value included in the route.                                                                                                                                                                                                                                                                    |
| <b>Router ID</b>             | BGP router ID as advertised by the neighbor in the open message.                                                                                                                                                                                                                                                 |
| <b>Primary Routing Table</b> | In a routing table group, the name of the primary routing table in which the route resides.                                                                                                                                                                                                                      |
| <b>Secondary Tables</b>      | In a routing table group, the name of one or more secondary tables in which the route resides.                                                                                                                                                                                                                   |
| <b>Originating RIB</b>       | 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. |
| <b>Node path count</b>       | Number of nodes in the path.                                                                                                                                                                                                                                                                                     |
| <b>Forwarding nexthops</b>   | 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                                | <a href="#">Syntax on page 254</a><br><a href="#">Syntax (MX Series Routers) on page 254</a><br><a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 254</a>                                                                                                                                                                                                                                                                                                                                                               |
| Syntax                                        | <pre>show route forwarding-table &lt;detail   extensive   summary&gt; &lt;all&gt; &lt;ccc interface-name&gt; &lt;destination destination-prefix&gt; &lt;family family   matching matching&gt; &lt;interface-name interface-name&gt; &lt;label name&gt; &lt;matching matching&gt; &lt;multicast&gt; &lt;table (default   logical-system-name/routing-instance-name   routing-instance-name)&gt; &lt;vlan (all   vlan-name)&gt; &lt;vpn vpn&gt;</pre>                                                                                     |
| Syntax (MX Series Routers)                    | <pre>show route forwarding-table &lt;detail   extensive   summary&gt; &lt;all&gt; &lt;bridge-domain (all   domain-name)&gt; &lt;ccc interface-name&gt; &lt;destination destination-prefix&gt; &lt;family family   matching matching&gt; &lt;interface-name interface-name&gt; &lt;label name&gt; &lt;learning-vlan-id learning-vlan-id&gt; &lt;matching matching&gt; &lt;multicast&gt; &lt;table (default   logical-system-name/routing-instance-name   routing-instance-name)&gt; &lt;vlan (all   vlan-name)&gt; &lt;vpn vpn&gt;</pre> |
| Syntax (TX Matrix and TX Matrix Plus Routers) | <pre>show route forwarding-table &lt;detail   extensive   summary&gt; &lt;all&gt; &lt;ccc interface-name&gt; &lt;destination destination-prefix&gt; &lt;family family   matching matching&gt; &lt;interface-name interface-name&gt; &lt;matching matching&gt; &lt;label name&gt; &lt;lcc number&gt; &lt;multicast&gt; &lt;table routing-instance-name&gt; &lt;vpn vpn&gt;</pre>                                                                                                                                                         |
| Release Information                           | Command introduced before Junos OS Release 7.4.<br>Option <b>bridge-domain</b> introduced in Junos OS Release 7.5<br>Option <b>learning-vlan-id</b> 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: **fibre-channel**, **fmembers**, **inet**, **inet6**, **iso**, **mpls**, **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** (*default* | *logical-system-name/routing-instance-name* | *routing-instance-name*)—(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 259](#)  
[show route forwarding-table detail on page 260](#)  
[show route forwarding-table destination extensive \(Weights and Balances\) on page 261](#)  
[show route forwarding-table extensive on page 261](#)  
[show route forwarding-table extensive \(RPF\) on page 263](#)  
[show route forwarding-table family mpls on page 263](#)  
[show route forwarding-table family mpls ccc ge-0/0/1.1004 on page 263](#)  
[show route forwarding-table family vpls on page 264](#)  
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled\) on page 264](#)  
[show route forwarding-table vpls \(Broadcast, unknown unicast, and multicast \(BUM\) hashing is enabled with MAC Statistics\) on page 264](#)  
[show route forwarding-table family vpls extensive on page 264](#)  
[show route forwarding-table table default on page 266](#)

[show route forwarding-table table](#)  
[logical-system-name/routing-instance-name](#) on page 267  
[show route forwarding-table vpn](#) on page 267

**Output Fields** Table 21 on page 257 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 21: 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 <b>table</b> <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              |
| Address family          | Address family (for example, IP, IPv6, ISO, MPLS, and VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | All levels              |
| Destination             | Destination of the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>detail extensive</b> |
| Route Type (Type)       | How the route was placed into the forwarding table. When the <b>detail</b> keyword is used, the route type might be abbreviated (as shown in parentheses): <ul style="list-style-type: none"> <li>• <b>cloned (clon)</b>—(TCP or multicast only) Cloned route.</li> <li>• <b>destination (dest)</b>—Remote addresses directly reachable through an interface.</li> <li>• <b>destination down (iddn)</b>—Destination route for which the interface is unreachable.</li> <li>• <b>interface cloned (ifcl)</b>—Cloned route for which the interface is unreachable.</li> <li>• <b>route down (ifdn)</b>—Interface route for which the interface is unreachable.</li> <li>• <b>ignore (ignr)</b>—Ignore this route.</li> <li>• <b>interface (intf)</b>—Installed as a result of configuring an interface.</li> <li>• <b>permanent (perm)</b>—Routes installed by the kernel when the routing table is initialized.</li> <li>• <b>user</b>—Routes installed by the routing protocol process or as a result of the configuration.</li> </ul> | All levels              |
| Route Reference (RtRef) | Number of routes to reference.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>detail extensive</b> |

Table 21: show route forwarding-table Output Fields (*continued*)

| Field Name                 | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Level of Output       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Flags                      | Route type flags: <ul style="list-style-type: none"> <li>• <b>none</b>—No flags are enabled.</li> <li>• <b>accounting</b>—Route has accounting enabled.</li> <li>• <b>cached</b>—Cache route.</li> <li>• <b>incoming-iface <i>interface-number</i></b>—Check against incoming interface.</li> <li>• <b>prefix load balance</b>—Load balancing is enabled for this prefix.</li> <li>• <b>rt nh decoupled</b>—Route has been decoupled from the next hop to the destination.</li> <li>• <b>sent to PFE</b>—Route has been sent to the Packet Forwarding Engine.</li> <li>• <b>static</b>—Static route.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | extensive             |
| Next hop                   | IP address of the next hop to the destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | detail extensive      |
| Next hop Type (Type)       | Next-hop type. When the <b>detail</b> keyword is used, the next-hop type might be abbreviated (as indicated in parentheses): <ul style="list-style-type: none"> <li>• <b>broadcast (bcst)</b>—Broadcast.</li> <li>• <b>deny</b>—Deny.</li> <li>• <b>discard (dscd)</b>—Discard.</li> <li>• <b>hold</b>—Next hop is waiting to be resolved into a unicast or multicast type.</li> <li>• <b>indexed (idxd)</b>—Indexed next hop.</li> <li>• <b>indirect (indr)</b>—Indirect next hop.</li> <li>• <b>local (locl)</b>—Local address on an interface.</li> <li>• <b>routed multicast (mcr)</b>—Regular multicast next hop.</li> <li>• <b>multicast (mcst)</b>—Wire multicast next hop (limited to the LAN).</li> <li>• <b>multicast discard (mdsc)</b>—Multicast discard.</li> <li>• <b>multicast group (mgrp)</b>—Multicast group member.</li> <li>• <b>receive (rcv)</b>—Receive.</li> <li>• <b>reject (rjct)</b>—Discard. An ICMP unreachable message was sent.</li> <li>• <b>resolve (rslv)</b>—Resolving the next hop.</li> <li>• <b>unicast (ucst)</b>—Unicast.</li> <li>• <b>unilist (ulst)</b>—List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.</li> </ul> | 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 |

Table 21: show route forwarding-table Output Fields (*continued*)

| Field Name    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                 | Level of Output |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 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 <b>Balance</b> 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 <b>rpf-check</b> 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
10.206.0.0/16 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 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: unilist 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 Route interface-index: 0
Flags: sent to PFE
Nexthop: 00:00:5E:00:53:1b
Next-hop type: unicast Index: 132 Reference: 4
Next-hop interface: fxp0.0

Destination: default
Route type: permanent
Route reference: 0 Route interface-index: 0
Flags: none
Next-hop type: reject Index: 14 Reference: 1

Destination: 127.0.0.1/32
Route type: interface
Route reference: 0 Route interface-index: 0
Flags: sent to PFE
Nexthop: 127.0.0.1
Next-hop type: local 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
Nexthop: 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
```

```
Route interface-index: 67
```

```
Flags: sent to PFE
```

```
Nexthop: 192.0.2.3
```

```
Next-hop type: broadcast
```

```
Index: 328
```

```
Reference: 1
```

```
Next-hop interface: so-1/1/0.0
```

```
RPF interface: so-1/1/0.0
```

**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 Type Index NhRef Netif
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
 indr 351 4
 Push 800000, Push 100002(top)
so-0/0/0.0
00:00:5E:00:53:1f/48 <<<<<Local CE
 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
 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
 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             | Route interface-index: 72 |              |
| Flags: sent to PFE             |                           |              |
| Next-hop type: flood           | Index: 289                | Reference: 1 |
| Next-hop type: unicast         | Index: 291                | Reference: 3 |
| Next-hop interface: fe-0/1/3.0 |                           |              |
| Next-hop type: unicast         | Index: 290                | Reference: 3 |
| Next-hop interface: fe-0/1/2.0 |                           |              |

|                        |                          |              |
|------------------------|--------------------------|--------------|
| Destination: default   |                          |              |
| Route type: permanent  |                          |              |
| Route reference: 0     | Route interface-index: 0 |              |
| Flags: none            |                          |              |
| Next-hop type: discard | Index: 341               | Reference: 1 |

|                                |                           |              |
|--------------------------------|---------------------------|--------------|
| Destination: fe-0/1/2.0        |                           |              |
| Route type: dynamic            |                           |              |
| Route reference: 0             | Route interface-index: 69 |              |
| Flags: sent to PFE             |                           |              |
| Next-hop type: flood           | Index: 293                | 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: 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     |                 | rjct | 36    | 2     |            |
| 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      | loc1 | 687   | 2     |            |
| 10.0.60.14/32  | dest | 0     | 10.0.60.14      | loc1 | 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       | loc1 | 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      | loc1 | 683   | 2     |            |
| 10.0.90.14/32  | dest | 0     | 10.0.90.14      | loc1 | 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
 ucst 789 1 ge-1/2/0.3
172.16.2.255/32 dest 0 172.16.2.255 bcst 768 1 ge-1/2/0.3
172.16.233.0/4 perm 1 mdsc 562 1
172.16.233.1/32 perm 0 172.16.233.1 mcst 558 1
255.255.255.255/32 perm 0 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 locl 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

|                                 |                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | show route hidden<br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                            |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Display only hidden route information. A hidden route is unusable, even if it is the best path.                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b>.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Understanding Hidden Routes</i></li> </ul>                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>    | <a href="#">show route hidden on page 269</a><br><a href="#">show route hidden detail on page 270</a><br><a href="#">show route hidden extensive on page 270</a><br><a href="#">show route hidden terse on page 270</a>                                                                                                                      |
| <b>Output Fields</b>            | For information about output fields, see the output field table for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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
 Unusable
10.12.1.0/24 [BGP/170] 03:44:10, localpref 100, from 10.4.4.4
 AS path: 100 I
 Unusable

```

```

10.12.80.4/30 [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 270](#).

### 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 >100.0

```



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              | <a href="#">Syntax on page 272</a><br><a href="#">Syntax (EX Series Switches) on page 272</a>                                                                                                                                                                                                                                                                                             |
| Syntax                      | <code>show route inactive-path</code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                |
| Syntax (EX Series Switches) | <code>show route inactive-path</code><br><code>&lt;brief   detail   extensive   terse&gt;</code>                                                                                                                                                                                                                                                                                          |
| Release Information         | Command introduced before Junos OS Release 7.4.<br>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                     | <b>none</b> —Display all inactive routes.<br><br><b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b> .<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(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"><li>• <a href="#">show route active-path on page 194</a></li></ul>                                                                                                                                                                                                                                                                                      |
| List of Sample Output       | <a href="#">show route inactive-path on page 272</a><br><a href="#">show route inactive-path detail on page 273</a><br><a href="#">show route inactive-path extensive on page 274</a><br><a href="#">show route inactive-path terse on page 274</a>                                                                                                                                       |
| Output Fields               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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 273](#).

### 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   |          |          | >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

---

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                             | <a href="#">Syntax on page 276</a><br><a href="#">Syntax (EX Series Switches and QFX Series) on page 276</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax</b>                                     | <code>show route instance</code><br><code>&lt;brief   detail   summary&gt;</code><br><code>&lt;instance-name&gt;</code><br><code>&lt;logical-system (all   logical-system-name)&gt;</code><br><code>&lt;operational&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax (EX Series Switches and QFX Series)</b> | <code>show route instance</code><br><code>&lt;brief   detail   summary&gt;</code><br><code>&lt;instance-name&gt;</code><br><code>&lt;operational&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Release Information</b>                        | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Command introduced in Junos OS Release 11.3 for the QFX Series.<br>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b>                                | Display routing instance information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Options</b>                                    | <p><b>none</b>—(Same as <b>brief</b>) Display standard information about all routing instances.</p> <p><b>brief   detail   summary</b>—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b>. (These options are not available with the <b>operational</b> keyword.)</p> <p><b>instance-name</b>—(Optional) Display information for all routing instances whose name begins with this string (for example, <b>cust1</b>, <b>cust11</b>, and <b>cust111</b> are all displayed when you run the <b>show route instance cust1</b> command).</p> <p><b>logical-system (all   logical-system-name)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b>operational</b>—(Optional) Display operational routing instances.</p> |
| <b>Required Privilege Level</b>                   | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>                      | <ul style="list-style-type: none"><li>• <i>Example: Transporting IPv6 Traffic Across IPv4 Using Filter-Based Tunneling</i></li><li>• <i>Example: Configuring the Helper Capability Mode for OSPFv3 Graceful Restart</i></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>                      | <a href="#">show route instance on page 278</a><br><a href="#">show route instance detail (Graceful Restart Complete) on page 278</a><br><a href="#">show route instance detail (Graceful Restart Incomplete) on page 280</a><br><a href="#">show route instance detail (VPLS Routing Instance) on page 281</a><br><a href="#">show route instance operational on page 282</a><br><a href="#">show route instance summary on page 282</a>                                                                                                                                                                                                                                                                                                                                                                                                              |

**Output Fields** Table 22 on page 277 lists the output fields for the **show route instance** command. Output fields are listed in the approximate order in which they appear.

**Table 22: 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    | ( <b>operational</b> keyword only) Names of all operational routing instances.                                                                                                                                                                                     | —                         |
| Type                             | Type of routing instance: <b>forwarding</b> , <b>l2vpn</b> , <b>no-forwarding</b> , <b>vpls</b> , <b>virtual-router</b> , or <b>vrf</b> .                                                                                                                          | All levels                |
| State                            | State of the routing instance: <b>active</b> or <b>inactive</b> .                                                                                                                                                                                                  | <b>brief detail none</b>  |
| Interfaces                       | Name of interfaces belonging to this routing instance.                                                                                                                                                                                                             | <b>brief detail none</b>  |
| Restart State                    | Status of graceful restart for this instance: <b>Pending</b> or <b>Complete</b> .                                                                                                                                                                                  | <b>detail</b>             |
| Path selection timeout           | Maximum amount of time, in seconds, remaining until graceful restart is declared complete. The default is <b>300</b> .                                                                                                                                             | <b>detail</b>             |
| Tables                           | Tables (and number of routes) associated with this routing instance.                                                                                                                                                                                               | <b>brief detail none</b>  |
| Route-distinguisher              | Unique route distinguisher associated with this routing instance.                                                                                                                                                                                                  | <b>detail</b>             |
| Vrf-import                       | VPN routing and forwarding instance import policy name.                                                                                                                                                                                                            | <b>detail</b>             |
| Vrf-export                       | VPN routing and forwarding instance export policy name.                                                                                                                                                                                                            | <b>detail</b>             |
| Vrf-import-target                | VPN routing and forwarding instance import target community name.                                                                                                                                                                                                  | <b>detail</b>             |
| Vrf-export-target                | VPN routing and forwarding instance export target community name.                                                                                                                                                                                                  | <b>detail</b>             |
| Vrf-edge-protection-id           | Context identifier configured for edge-protection.                                                                                                                                                                                                                 | <b>detail</b>             |
| Fast-reroute-priority            | Fast reroute priority setting for a VPLS routing instance: <b>high</b> , <b>medium</b> , or <b>low</b> . The default is <b>low</b> .                                                                                                                               | <b>detail</b>             |
| Restart State                    | Restart state: <ul style="list-style-type: none"> <li><b>Pending:protocol-name</b>—List of protocols that have not yet completed graceful restart for this routing table.</li> <li><b>Complete</b>—All protocols have restarted for this routing table.</li> </ul> | <b>detail</b>             |
| Primary rib                      | Primary table for this routing instance.                                                                                                                                                                                                                           | <b>brief none summary</b> |
| 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

```

```

1si.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                  |
|          |            | LDP.inet6.0      | 0/0/0                  |
|          |            | LDP.l2circuit.0  | 0/0/0                  |
| OSPF     | vrf        | OSPF.inet.0      | 7/0/0                  |
|          |            | OSPF.iso.0       | 0/0/0                  |
|          |            | OSPF.inet6.0     | 0/0/0                  |
| RIP      | vrf        | RIP.inet.0       | 6/0/0                  |
|          |            | RIP.iso.0        | 0/0/0                  |
|          |            | RIP.inet6.0      | 0/0/0                  |
| STATIC   | vrf        | STATIC.inet.0    | 4/0/0                  |

|                |       |
|----------------|-------|
| STATIC.iso.0   | 0/0/0 |
| STATIC.inet6.0 | 0/0/0 |

## show route next-hop

|                                    |                                                                                                                                                                                                                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 284</a><br><a href="#">Syntax (EX Series Switches) on page 284</a>                                                                                                                                                                                                              |
| <b>Syntax</b>                      | <b>show route next-hop</b> <i>next-hop</i><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                 |
| <b>Syntax (EX Series Switches)</b> | <b>show route next-hop</b> <i>next-hop</i><br><brief   detail   extensive   terse>                                                                                                                                                                                                                         |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                      |
| <b>Description</b>                 | Display the entries in the routing table that are being sent to the specified next-hop address.                                                                                                                                                                                                            |
| <b>Options</b>                     | <b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.<br><br><b><i>next-hop</i></b> —Next-hop address. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>       | <a href="#">show route next-hop on page 284</a><br><a href="#">show route next-hop detail on page 285</a><br><a href="#">show route next-hop extensive on page 287</a><br><a href="#">show route next-hop terse on page 288</a>                                                                            |
| <b>Output Fields</b>               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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-kerne1 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-kerne1 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 5 >192.168.71.254
* 10.209.0.0/16 S 5 5 >192.168.71.254
* 172.16.0.0/12 S 5 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              | <a href="#">Syntax on page 290</a><br><a href="#">Syntax (EX Series Switches) on page 290</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Syntax                      | <code>show route output (address <i>ip-address</i>   interface <i>interface-name</i>)</code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                |
| Syntax (EX Series Switches) | <code>show route output (address <i>ip-address</i>   interface <i>interface-name</i>)</code><br><code>&lt;brief   detail   extensive   terse&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Release Information         | Command introduced before Junos OS Release 7.4.<br>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 <b>show route advertising-protocol bgp</b> and <b>show route receive-protocol bgp</b> commands instead.</p>                                                                                                                                                                                                                      |
| Options                     | <p><b>address <i>ip-address</i></b>—Display entries in the routing table that are to be sent out the interface with the specified IP address.</p> <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b>.</p> <p><b>interface <i>interface-name</i></b>—Display entries in the routing table that are to be sent out the interface with the specified name.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| Required Privilege Level    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| List of Sample Output       | <a href="#">show route output address on page 291</a><br><a href="#">show route output address detail on page 291</a><br><a href="#">show route output address extensive on page 292</a><br><a href="#">show route output address terse on page 292</a><br><a href="#">show route output interface on page 292</a><br><a href="#">show route output interface detail on page 293</a><br><a href="#">show route output interface extensive on page 293</a><br><a href="#">show route output interface terse on page 293</a>                                                                                                                       |
| Output Fields               | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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 291](#).

### 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 >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 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 293](#).

### 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
 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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 295</a><br><a href="#">Syntax (EX Series Switches) on page 295</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Syntax</b>                      | <pre>show route protocol <i>protocol</i> &lt;brief   detail   extensive   terse&gt; &lt;logical-system (all   <i>logical-system-name</i>)&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax (EX Series Switches)</b> | <pre>show route protocol <i>protocol</i> &lt;brief   detail   extensive   terse&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Release Information</b>         | <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><b>ospf2</b> and <b>ospf3</b> options introduced in Junos OS Release 9.2.</p> <p><b>ospf2</b> and <b>ospf3</b> options introduced in Junos OS Release 9.2 for EX Series switches.</p> <p><b>flow</b> option introduced in Junos OS Release 10.0.</p> <p><b>flow</b> option introduced in Junos OS Release 10.0 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Description</b>                 | Display the route entries in the routing table that were learned from a particular protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Options</b>                     | <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output. If you do not specify a level of output, the system defaults to <b>brief</b>.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b><i>protocol</i></b>—Protocol from which the route was learned:</p> <ul style="list-style-type: none"> <li>• <b>access</b>—Access route for use by DHCP application</li> <li>• <b>access-internal</b>—Access-internal route for use by DHCP application</li> <li>• <b>aggregate</b>—Locally generated aggregate route</li> <li>• <b>arp</b>—Route learned through the Address Resolution Protocol</li> <li>• <b>atmvpn</b>—Asynchronous Transfer Mode virtual private network</li> <li>• <b>bgp</b>—Border Gateway Protocol</li> <li>• <b>ccc</b>—Circuit cross-connect</li> <li>• <b>direct</b>—Directly connected route</li> <li>• <b>dvmrp</b>—Distance Vector Multicast Routing Protocol</li> <li>• <b>esis</b>—End System-to-Intermediate System</li> <li>• <b>flow</b>—Locally defined flow-specification route</li> <li>• <b>frr</b>—Precomputed protection route or backup route used when a link goes down</li> <li>• <b>isis</b>—Intermediate System-to-Intermediate System</li> <li>• <b>ldp</b>—Label Distribution Protocol</li> <li>• <b>l2circuit</b>—Layer 2 circuit</li> </ul> |

- **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.

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>    | <a href="#">show route protocol access on page 297</a><br><a href="#">show route protocol access-internal extensive on page 297</a><br><a href="#">show route protocol arp on page 297</a><br><a href="#">show route protocol bgp on page 298</a><br><a href="#">show route protocol bgp detail on page 298</a><br><a href="#">show route protocol bgp detail (Labeled Unicast) on page 298</a><br><a href="#">show route protocol bgp extensive on page 299</a><br><a href="#">show route protocol bgp terse on page 300</a><br><a href="#">show route protocol direct on page 300</a><br><a href="#">show route protocol frr on page 300</a><br><a href="#">show route protocol l2circuit detail on page 301</a><br><a href="#">show route protocol l2vpn extensive on page 302</a><br><a href="#">show route protocol ldp on page 302</a><br><a href="#">show route protocol ldp extensive on page 303</a><br><a href="#">show route protocol ospf (Layer 3 VPN) on page 304</a><br><a href="#">show route protocol ospf detail on page 304</a><br><a href="#">show route protocol rip on page 305</a> |

[show route protocol rip detail on page 305](#)  
[show route protocol ripng table inet6 on page 305](#)  
[show route protocol static detail on page 306](#)

**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 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: 12 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-kerne1 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
 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::4/128 * [RIPng/100] 02:13:33, metric 2
 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::5/128 * [RIPng/100] 02:13:33, metric 2
 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
```

```
1111::6/128 *[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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>              | <a href="#">Syntax on page 307</a><br><a href="#">Syntax (EX Series Switches) on page 307</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax</b>                      | show route receive-protocol <i>protocol neighbor-address</i><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Syntax (EX Series Switches)</b> | show route receive-protocol <i>protocol neighbor-address</i><br><brief   detail   extensive   terse>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>         | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>                 | Display the routing information as it was received through a particular neighbor using a particular dynamic routing protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                     | <p><b>brief   detail   extensive   terse</b>—(Optional) Display the specified level of output.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p><b><i>protocol neighbor-address</i></b>—Protocol transmitting the route (<b>bgp</b>, <b>dvmrp</b>, <b>msdp</b>, <b>pim</b>, <b>rip</b>, or <b>ripng</b>) and address of the neighboring router from which the route entry was received.</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Additional Information</b>      | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>       | <a href="#">show route receive-protocol bgp on page 310</a><br><a href="#">show route receive-protocol bgp extensive on page 310</a><br><a href="#">show route receive-protocol bgp table extensive on page 310</a><br><a href="#">show route receive-protocol bgp logical-system extensive on page 311</a><br><a href="#">show route receive-protocol bgp detail (Layer 2 VPN) on page 312</a><br><a href="#">show route receive-protocol bgp extensive (Layer 2 VPN) on page 312</a><br><a href="#">show route receive-protocol bgp (Layer 3 VPN) on page 313</a><br><a href="#">show route receive-protocol bgp detail (Layer 3 VPN) on page 313</a><br><a href="#">show route receive-protocol bgp detail (Long-Lived Graceful Restart) on page 314</a><br><a href="#">show route receive-protocol bgp detail (Labeled Unicast) on page 314</a><br><a href="#">show route receive-protocol bgp extensive (Layer 3 VPN) on page 315</a> |
| <b>Output Fields</b>               | <a href="#">Table 23 on page 308</a> describes the output fields for the <b>show route receive-protocol</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 23: 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"> <li>• <b>active</b></li> <li>• <b>holddown</b> (routes that are in pending state before being declared inactive)</li> <li>• <b>hidden</b> (routes that are not used because of a routing policy)</li> </ul>                                                                                                                                      | All levels              |
| Prefix                                          | Destination prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | none <b>brief</b>       |
| MED                                             | Multiple exit discriminator value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                      | none <b>brief</b>       |
| <i>destination-prefix</i><br>(entry, announced) | Destination prefix. The <b>entry</b> value is the number of routes for this destination, and the <b>announced</b> value is the number of routes being announced for this destination.                                                                                                                                                                                                                                                                                         | <b>detail extensive</b> |
| <b>Accepted LongLivedStale</b>                  | 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.                                                                                                                                                           | <b>detail extensive</b> |
| <b>Accepted LongLivedStaleImport</b>            | 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.<br><br>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 | <b>detail extensive</b> |
| <b>ImportAccepted LongLivedStaleImport</b>      | 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<br><br>The LongLivedStaleImport flag indicates that the route was marked LLGR-stale when it was received from a peer, or by import policy.                                                                                                                                                                      | <b>detail extensive</b> |
| <b>Route Distinguisher</b>                      | 64-bit prefix added to IP subnets to make them unique.                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>detail extensive</b> |
| <b>Label-Base, range</b>                        | 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.                                                                                                                                                                                                                                                                                                        | <b>detail extensive</b> |
| <b>VPN Label</b>                                | 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.                                                                                                                                                                                                                                                                         | <b>detail extensive</b> |

Table 23: show route receive-protocol Output Fields (*continued*)

| Field Name                  | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Level of Output  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Next hop</b>             | Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | All levels       |
| <b>Localpref or Lclpref</b> | Local preference value included in the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | All levels       |
| <b>AS path</b>              | <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"> <li>• I—IGP.</li> <li>• E—EGP.</li> <li>• ?—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li>• [ ]—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.</li> <li>• [ ]—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.</li> <li>• { }—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.</li> <li>• ( )—Parentheses enclose a confederation.</li> <li>• ( [ ] )—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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       |
| <b>Route Labels</b>         | Stack of labels carried in the BGP route update.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | detail extensive |
| <b>Cluster list</b>         | (For route reflected output only) Cluster ID sent by the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | detail extensive |
| <b>Originator ID</b>        | (For route reflected output only) Address of routing device that originally sent the route to the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | detail extensive |
| <b>Communities</b>          | Community path attribute for the route. See the Output Field table in the <a href="#">show route detail</a> command for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | detail extensive |
| <b>AIGP</b>                 | Accumulated interior gateway protocol (AIGP) BGP attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | detail extensive |
| <b>Attrset AS</b>           | Number, local preference, and path of the AS that originated the route. These values are stored in the <b>Attrset</b> attribute at the originating routing device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | detail extensive |
| <b>Layer2-info: encaps</b>  | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | detail extensive |
| <b>control flags</b>        | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | detail extensive |

Table 23: show route receive-protocol Output Fields (*continued*)

| Field Name | Field Description                                       | Level of Output  |
|------------|---------------------------------------------------------|------------------|
| 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.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 (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.l3vpn.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 table

---

|                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                      | <a href="#">Syntax on page 316</a><br><a href="#">Syntax (EX Series Switches and QFX Series Switches) on page 316</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax</b>                                              | <code>show route table <i>routing-table-name</i></code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (EX Series Switches and QFX Series Switches)</b> | <code>show route table <i>routing-table-name</i></code><br><code>&lt;brief   detail   extensive   terse&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Release Information</b>                                 | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.<br>Statement introduced in Junos OS Release 14.1X53-D15 for QFX Series switches.<br>Show route table evpn statement introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>                                         | Display the route entries in a particular routing table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                                             | <b>brief   detail   extensive   terse</b> —(Optional) Display the specified level of output.<br><br><b>logical-system (all   <i>logical-system-name</i>)</b> —(Optional) Perform this operation on all logical systems or on a particular logical system.<br><br><b><i>routing-table-name</i></b> —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 <b>show route table inet</b> command).                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Required Privilege Level</b>                            | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>                               | <ul style="list-style-type: none"><li>• <a href="#">show route summary</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>List of Sample Output</b>                               | <a href="#">show route table bgp.l2.vpn on page 327</a><br><a href="#">show route table bgp.l3vpn.0 on page 327</a><br><a href="#">show route table bgp.l3vpn.0 detail on page 327</a><br><a href="#">show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured) on page 328</a><br><a href="#">show route table bgp.evpn.0 on page 329</a><br><a href="#">show route table evpna.evpn.0 on page 329</a><br><a href="#">show route table inet.0 on page 329</a><br><a href="#">show route table inet.3 on page 330</a><br><a href="#">show route table inet.3 protocol ospf on page 330</a><br><a href="#">show route table inet6.0 on page 330</a><br><a href="#">show route table inet6.3 on page 331</a><br><a href="#">show route table inetflow detail on page 331</a><br><a href="#">show route table l2circuit.0 on page 331</a><br><a href="#">show route table mpls on page 332</a> |

[show route table mpls extensive on page 332](#)  
[show route table mpls.0 on page 332](#)  
[show route table mpls.0 detail \(PTX Series\) on page 333](#)  
[show route table mpls.0 ccc ge-0/0/1.1004 detail on page 334](#)  
[show route table mpls.0 protocol evpn on page 335](#)  
[show route table mpls.0 protocol ospf on page 341](#)  
[show route table mpls.0 extensive \(PTX Series\) on page 341](#)  
[show route table mpls.0 \(RSVP Route—Transit LSP\) on page 342](#)  
[show route table vpls\\_1 detail on page 342](#)  
[show route table vpn-a on page 342](#)  
[show route table vpn-a.mdt.0 on page 343](#)  
[show route table VPN-A detail on page 343](#)  
[show route table VPN-AB.inet.0 on page 343](#)  
[show route table VPN\\_blue.mvpn-inet6.0 on page 344](#)  
[show route table vrf1.mvpn.0 extensive on page 344](#)  
[show route table inetflow detail on page 345](#)  
[show route table bgp.evpn.0 extensive |no-more \(EVPN\) on page 348](#)

**Output Fields** [Table 13 on page 187](#) describes the output fields for the **show route table** command. Output fields are listed in the approximate order in which they appear.

**Table 24: 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"> <li>• <b>Pending:protocol-name</b>—List of protocols that have not yet completed graceful restart for this routing table.</li> <li>• <b>Complete</b>—All protocols have restarted for this routing table.</li> </ul> <p>For example, if the output shows-</p> <ul style="list-style-type: none"> <li>• LDP.inet.0 : 5 routes (4 active, 1 holddown, 0 hidden)<br/>Restart Pending: OSPF LDP VPN</li> </ul> <p>This indicates that <b>OSPF</b>, <b>LDP</b>, and <b>VPN</b> protocols did not restart for the <b>LDP.inet.0</b> routing table.</p> <ul style="list-style-type: none"> <li>• vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)<br/>Restart Complete</li> </ul> <p>This indicates that all protocols have restarted for the <b>vpls_1.l2vpn.0</b> routing table.</p> |
| <i>number destinations</i> | Number of destinations for which there are routes in the routing table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <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"> <li>• <b>active</b> (routes that are active)</li> <li>• <b>holddown</b> (routes that are in the pending state before being declared inactive)</li> <li>• <b>hidden</b> (routes that are not used because of a routing policy)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 24: show route table Output Fields (*continued*)

| Field Name                                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>route-destination</i><br>(entry, announced) | <p>Route destination (for example:10.0.0.1/24). The <b>entry</b> value is the number of routes for this destination, and the <b>announced</b> 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"> <li>• <b>MPLS-label</b> (for example, 80001).</li> <li>• <b>interface-name</b> (for example, ge-1/0/2).</li> <li>• <b>neighbor-address:control-word-status:encapsulation type:vc-id:source</b> (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> <li>• <b>neighbor-address</b>—Address of the neighbor.</li> <li>• <b>control-word-status</b>—Whether the use of the control word has been negotiated for this virtual circuit: <b>NoCtrlWord</b> or <b>CtrlWord</b>.</li> <li>• <b>encapsulation type</b>—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.</li> <li>• <b>vc-id</b>—Virtual circuit identifier.</li> <li>• <b>source</b>—Source of the advertisement: <b>Local</b> or <b>Remote</b>.</li> </ul> </li> <li>• <b>inclusive multicast Ethernet tag route</b>—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"> <li>• <b>route distinguisher</b>—(8 octets) Route distinguisher (RD) must be the RD of the EVPN instance (EVI) that is advertising the NLRI.</li> <li>• <b>Ethernet tag ID</b>—(4 octets) Identifier of the Ethernet tag. Can set to 0 or to a valid Ethernet tag value.</li> <li>• <b>IP address length</b>—(1 octet) Length of IP address in bits.</li> <li>• <b>originating router's IP address</b>—(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.</li> </ul> </li> </ul> |
| 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"> <li>• <b>S=0 route</b> 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).</li> <li>• If there is no <b>S=</b> information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| [ <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"> <li>• <b>+</b>—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table.</li> <li>• <b>-</b>—A hyphen indicates the last active route.</li> <li>• <b>*</b>—An asterisk indicates that the route is both the active and the last active route. An asterisk before a <b>to</b> line indicates the best subpath to the route.</li> </ul> <p>In every routing metric except for the BGP <b>LocalPref</b> attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the <b>LocalPref</b> value in the <b>Preference2</b> field. For example, if the <b>LocalPref</b> value for Route 1 is 100, the <b>Preference2</b> value is -101. If the <b>LocalPref</b> value for Route 2 is 155, the <b>Preference2</b> value is -156. Route 2 is preferred because it has a higher <b>LocalPref</b> value and a lower <b>Preference2</b> value.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



Table 24: show route table Output Fields (*continued*)

| Field Name                                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 <a href="#">Table 16 on page 217</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 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 <b>Selected</b>. This field can also contain the following information:</p> <ul style="list-style-type: none"> <li>• <b>Weight</b>—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.</li> <li>• <b>Balance</b>—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.</li> </ul> |
| Label-switched-path <i>lsp-path-name</i>      | 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 <b>pop</b> (where a label is removed from the top of the stack), <b>push</b> (where another label is added to the label stack), or <b>swap</b> (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 <a href="#">Table 17 on page 219</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Table 24: show route table Output Fields (*continued*)

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local AS          | AS number of the local routing devices.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Age               | How long the route has been known.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| AI GP             | Accumulated interior gateway protocol (AIGP) BGP attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Metric <i>n</i>   | 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"> <li><i>n</i>—An index used by Juniper Networks customer support only.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 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"> <li><b>I</b>—IGP.</li> <li><b>E</b>—EGP.</li> <li><b>Recorded</b>—The AS path is recorded by the sample process (sampled).</li> <li><b>?</b>—Incomplete; typically, the AS path was aggregated.</li> </ul> <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> <li><b>[ ]</b>—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.</li> <li><b>[ ]</b>—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.</li> <li><b>{ }</b>—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.</li> <li><b>( )</b>—Parentheses enclose a confederation.</li> <li><b>( [ ] )</b>—Parentheses and brackets enclose a confederation set.</li> </ul> <p><b>NOTE:</b> 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 24: show route table 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"> <li>• <b>Invalid</b>—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.</li> <li>• <b>Unknown</b>—Indicates that the prefix is not among the prefixes or prefix ranges in the database.</li> <li>• <b>Unverified</b>—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.</li> <li>• <b>Valid</b>—Indicates that the prefix and autonomous system pair are found in the database.</li> </ul> |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 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 <a href="#">Table 18 on page 221</a> for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Layer2-info: encaps     | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| control flags           | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 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).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Table 24: show route table Output Fields (*continued*)

| Field Name                          | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 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 16 on page 217](#) describes all possible values for the Next-hop Types output field.

Table 25: 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. |

Table 25: Next-hop Types Output Field Values (*continued*)

| Next-Hop Type            | Description                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 (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"> <li>• Must not be a direct or local subnet for the routing device.</li> <li>• Must have a next hop that is directly connected to the routing device.</li> </ul> |
| 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 17 on page 219 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 26: 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.                                                                                                                                                                   |
| 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.                                                                                                                                      |

Table 26: State Output Field Values (*continued*)

| Value                          | Description                                                                                                                                                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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.                                                                                                                                                                 |
| 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"> <li>• The route is damped.</li> <li>• The route is rejected by an import policy.</li> <li>• The route is unresolved.</li> </ul> |
| Update source                  | Last tiebreaker is the lowest IP address value.                                                                                                                                                                                   |

Table 18 on page 221 describes the possible values for the Communities output field.

Table 27: 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.                                        |
| <b>bandwidth:</b> <i>local AS number:link-bandwidth-number</i> | 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. |
| <b>domain-id</b>                                               | Unique configurable number that identifies the OSPF domain.                                                                                                                                                                                                                           |
| <b>domain-id-vendor</b>                                        | 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.                                                                                                                     |
| <b>origin</b>                                                  | (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.                                 |
| <b>route-type-vendor</b>                                       | 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 <b>area-number:ospf-route-type:options</b> .                                                                                  |
| <b>rte-type</b>                                                | 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 <b>area-number:ospf-route-type:options</b> .                                                                                  |
| <b>target</b>                                                  | Defines which VPN the route participates in; <b>target</b> has the format <b>32-bit IP address:16-bit number</b> . For example, 10.19.0.0:100.                                                                                                                                        |
| <b>unknown IANA</b>                                            | 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.                                                                                                                                     |
| <b>unknown OSPF vendor community</b>                           | 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
 *[BGP/170] 00:03:59, MED 1, localpref 100, from
10.255.71.15
 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 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
> 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
> 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
> 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
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
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 00:22:22:22:22:22:22:22:22:22:22:22
> 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 00:22:22:22:22:22:22:22:22:22:22:22
> 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
mhevnpn, 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
mhevnpn, 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 mhevnpn, route-type
Egress-MAC, ESI 00:22:22:22:22:22:22:22:22:22:22:22
> 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
mhevnpn, 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
 > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
300352(S=0) *[RSVP/7/1] 00:08:00, metric 1
 > to 10.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
300384 *[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
192.168.16.1:1:1/96

```



```

*[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.0.0.0.0+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.l3vpn.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/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/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
 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

|                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>List of Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                   | <a href="#">Syntax on page 352</a><br><a href="#">Syntax (EX Series Switches) on page 352</a>                                                                                                                                                   |
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | <pre>show route terse &lt;logical-system (all   <i>logical-system-name</i>)&gt;</pre>                                                                                                                                                           |
| <b>Syntax (EX Series Switches)</b>                                                                                                                                                                                                                                                                                                                                                                                                      | show route terse                                                                                                                                                                                                                                |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                                                                                                                                              | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                           |
| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                      | Display a high-level summary of the routes in the routing table.                                                                                                                                                                                |
| <div>  <p><b>NOTE:</b> For BGP routes, the <code>show route terse</code> command displays the local preference attribute and MED instead of the metric1 and metric2 values. This is mostly due to historical reasons.</p> <p>To display the metric1 and metric2 value of a BGP route, use the <a href="#">show route extensive</a> command.</p> </div> |                                                                                                                                                                                                                                                 |
| <b>Options</b>                                                                                                                                                                                                                                                                                                                                                                                                                          | <p><b>none</b>—Display a high-level summary of the routes in the routing table.</p> <p><b>logical-system (all   <i>logical-system-name</i>)</b>—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                                                                                                                                         | view                                                                                                                                                                                                                                            |
| <b>List of Sample Output</b>                                                                                                                                                                                                                                                                                                                                                                                                            | <a href="#">show route terse on page 354</a>                                                                                                                                                                                                    |
| <b>Output Fields</b>                                                                                                                                                                                                                                                                                                                                                                                                                    | <a href="#">Table 28 on page 352</a> describes the output fields for the <code>show route terse</code> command. Output fields are listed in the approximate order in which they appear.                                                         |

**Table 28: 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.                                                                                                                                                                                                                                                                                         |
| <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"> <li><b>active</b> (routes that are active)</li> <li><b>holddown</b> (routes that are in the pending state before being declared inactive)</li> <li><b>hidden</b> (routes that are not used because of a routing policy)</li> </ul> |

Table 28: show route terse Output Fields (*continued*)

| Field Name       | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>route key</i> | <p>Key for the state of the route:</p> <ul style="list-style-type: none"> <li>• <b>+</b>—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table.</li> <li>• <b>-</b>—A hyphen indicates the last active route.</li> <li>• <b>*</b>—An asterisk indicates that the route is both the active and the last active route. An asterisk before a <b>to</b> line indicates the best subpath to the route.</li> </ul>                                                                                                                                                                                                                |
| <b>A</b>         | Active route. An asterisk (*) indicates this is the active route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>V</b>         | <p>Validation status of the route:</p> <ul style="list-style-type: none"> <li>• <b>?</b>—Not evaluated. Indicates that the route was not learned through BGP.</li> <li>• <b>I</b>—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.</li> <li>• <b>N</b>—Unknown. Indicates that the prefix is not among the prefixes or prefix ranges in the database.</li> <li>• <b>V</b>—Valid. Indicates that the prefix and autonomous system pair are found in the database.</li> </ul> |
| Destination      | Destination of the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>P</b>         | <p>Protocol through which the route was learned:</p> <ul style="list-style-type: none"> <li>• <b>A</b>—Aggregate</li> <li>• <b>B</b>—BGP</li> <li>• <b>C</b>—CCC</li> <li>• <b>D</b>—Direct</li> <li>• <b>G</b>—GMPLS</li> <li>• <b>I</b>—IS-IS</li> <li>• <b>L</b>—L2CKT, L2VPN, LDP, Local</li> <li>• <b>K</b>—Kernel</li> <li>• <b>M</b>—MPLS, MSDP</li> <li>• <b>O</b>—OSPF</li> <li>• <b>P</b>—PIM</li> <li>• <b>R</b>—RIP, RIPng</li> <li>• <b>S</b>—Static</li> <li>• <b>T</b>—Tunnel</li> </ul>                                                                                                                                                                                     |
| <b>Prf</b>       | <p>Preference value of the route. In every routing metric except for the BGP <b>LocalPref</b> attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the <b>LocalPref</b> value in the <b>Preference2</b> field. For example, if the <b>LocalPref</b> value for Route 1 is 100, the <b>Preference2</b> value is -101. If the <b>LocalPref</b> value for Route 2 is 155, the <b>Preference2</b> value is -156. Route 2 is preferred because it has a higher <b>LocalPref</b> value and a lower <b>Preference2</b> value.</p>                                                                                              |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 28: show route terse Output Fields (*continued*)

| Field Name | Field Description                                                                                                                                                                                                                                                                                                                                          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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"> <li>I—IGP.</li> <li>E—EGP.</li> <li>?—Incomplete; typically, the AS path was aggregated.</li> </ul> |

## 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 I
 unverified
* ? 172.16.1.1/32 D 0 110 >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 0 100 >1t-1/2/0.1 I
? B 170 100 >10.0.0.2
 unverified
* ? 10.0.0.1/32 L 0 100 Local I
* ? 10.0.0.4/30 B 170 100 >10.0.0.2 I
 unverified
* ? 10.0.0.8/30 B 170 100 >10.0.0.2 I
 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 MultiRecv

```

## test policy

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>test policy <i>policy-name</i> <i>prefix</i></code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.<br>Command introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | Test a policy configuration to determine which prefixes match routes in the routing table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                 | <div>  <p><b>NOTE:</b> If you are using the <code>test policy</code> 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 <code>set cli logical-system R2</code> command.</p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Options</b>                  | <p><i>policy-name</i>—Name of a policy.</p> <p><i>prefix</i>—Destination prefix to match.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Additional Information</b>   | <p>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 <b>from</b> clause in the specified policy. All prefixes accepted by the policy are displayed. The <b>test policy</b> command evaluates a policy differently from the BGP import process. When testing a policy that contains an <b>interface</b> match condition in the <b>from</b> clause, the <b>test policy</b> command uses the match condition. In contrast, BGP does not use the <b>interface</b> match condition when evaluating the policy against routes learned from internal BGP (IBGP) or external BGP (EGBP) multihop peers.</p> <p>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 <code>show policy <i>policy-name</i> statistics</code> command.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Understanding Routing Policy Tests</i></li> <li>• <i>Example: Testing a Routing Policy with Complex Regular Expressions</i></li> <li>• <a href="#">show policy on page 174</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>List of Sample Output</b>    | <a href="#">test policy on page 356</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Output Fields</b>            | For information about output fields, see the output field tables for the <a href="#">show route</a> command, the <a href="#">show route detail</a> command, the <a href="#">show route extensive</a> command, or the <a href="#">show route terse</a> 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 12
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
```