



Junos[®] OS

RIPng Configuration Guide

Release
12.3



Published: 2012-12-08

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Junos® OS RIPng Configuration Guide

12.3

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Supported Platforms

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

- ACX Series
- J Series
- SRX Series
- T Series
- MX Series
- M 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 the CLI User Guide.

Documentation Conventions

Table 1 on page xiii 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.

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 book 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 System Basics Configuration 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>
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)	Enclose 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)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	

J-Web GUI Conventions

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

Convention	Description	Examples
Bold text like this	Represents J-Web 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 J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

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- Document or topic name
- URL or page number
- Software release version (if applicable)

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- 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/>.
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- 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: <https://www.juniper.net/alerts/>
- 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 RIPng on page 3](#)
- [RIPng Standards on page 5](#)

CHAPTER 1

Introduction to RIPng

- [RIPng Overview on page 3](#)

RIPng Overview

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

On devices in the secure context, IPv6 is disabled. You must enable IPv6 to use RIPng.

This topic contains the following sections:

- [RIPng Protocol Overview on page 3](#)
- [RIPng Standards on page 4](#)
- [RIPng Packets on page 4](#)

RIPng Protocol Overview

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

RIPng is a distinct routing protocol from RIPv2. The Junos[®] operating system (Junos OS) implementation of RIPng is similar to RIPv2, but has the following differences:

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

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

RIPng has the following architectural limitations:

- The longest network path cannot exceed 15 hops (assuming that each network, or hop, has a cost of 1).

- RIPng is prone to routing loops when the routing tables are reconstructed. Especially when RIPng is implemented in large networks that consist of several hundred routers, RIPng might take an extremely long time to resolve routing loops.
- RIPng uses only a fixed metric to select a route. Other IGP's use additional parameters, such as measured delay, reliability, and load.

RIPng Standards

RIPng is defined in the following documents:

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

To access Internet Requests for Comments (RFCs) and drafts, see the Internet Engineering Task Force (IETF) website at <http://www.ietf.org>.

RIPng Packets

A RIPng packet header contains the following fields:

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

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

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

Related Documentation

- *Junos OS Feature Support Reference for SRX Series and J Series Devices*
- Routing Databases Overview
- RIP Overview
- [Example: Configuring a Basic RIPng Network on page 9](#)

CHAPTER 2

RIPng Standards

- [Supported RIP and RIPng Standards on page 5](#)

Supported RIP and RIPng Standards

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

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

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

Multiple keys using distinct key IDs are not supported.

- RFC 2453, *RIP Version 2*

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

- RFC 2081, *RIPng Protocol Applicability Statement*

Related Documentation

- [Supported IPv4, TCP, and UDP Standards](#)
- [Supported IPv6 Standards](#)
- [Accessing Standards Documents on the Internet](#)

PART 2

Configuration

- [Concepts and Examples on page 9](#)
- [Configuration Statements on page 41](#)

CHAPTER 3

Concepts and Examples

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- [Example: Applying Policies to RIPng Routes Imported from Neighbors on page 16](#)
- [Example: Configuring the Metric Value Added to Imported RIPng Routes on page 22](#)
- [Example: Configuring RIPng Timers on page 27](#)
- [Example: Tracing RIPng Protocol Traffic on page 34](#)

Example: Configuring RIPng

- [Understanding Basic RIPng Routing on page 9](#)
- [Example: Configuring a Basic RIPng Network on page 9](#)

Understanding Basic RIPng Routing

By default, RIP next generation (RIPng) routes are not redistributed. You must configure export policy to redistribute RIPng routes.

To have a router exchange routes with other routers, you must configure RIPng groups and neighbors. RIPng routes received from routers not configured as RIPng neighbors are ignored. Likewise, RIPng routes are advertised only to routers configured as RIPng neighbors.

Example: Configuring a Basic RIPng Network

This example shows how to configure a basic RIPng network.

- [Requirements on page 9](#)
- [Overview on page 10](#)
- [Configuration on page 10](#)
- [Verification on page 12](#)

Requirements

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

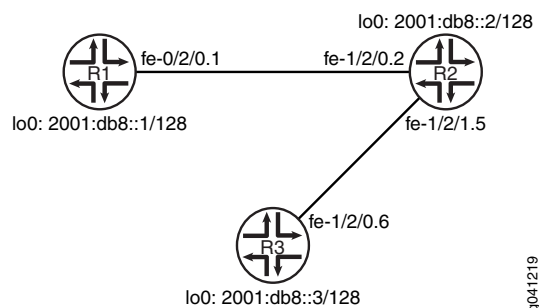
Overview

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

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

To use RIPng on the device, you must configure RIPng on all of the RIPng interfaces within the network. [Figure 1 on page 10](#) shows the topology used in this example.

Figure 1: Sample RIPng Network Topology



[“CLI Quick Configuration” on page 10](#) shows the configuration for all of the devices in [Figure 1 on page 10](#). The section [“Step-by-Step Procedure” on page 11](#) describes the steps on Device R1.

Configuration

CLI Quick Configuration

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

Device R1

```

set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64
set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
  
```

Device R2

```

set interfaces fe-1/2/0 unit 2 description to-R1
set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
  
```

```

set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2
set protocols ripng group ripng-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

Device R3

```

set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

**Step-by-Step
Procedure**

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

To configure a basic RIPng network:

1. Configure the network interfaces.

Use the **eui-64** statement to automatically generate the host portion of the interface address and the link-local address.

For the loopback interface, you must assign a 128-bit address.

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128

```

2. Create the RIPng group and add the interface.

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

```

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

```

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

```

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

```

4. Apply the routing policy.

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

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

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

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

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

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

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

Verification

Confirm that the configuration is working properly.

- [Checking the Routing Table on page 13](#)
- [Checking the Interface Addresses on page 13](#)
- [Looking at the Routes That Device R1 Is Advertising to Device R2 on page 13](#)
- [Verifying the RIPng-Enabled Interfaces on page 14](#)

- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 14](#)
- [Verifying the Exchange of RIPng Messages on page 15](#)
- [Verifying Reachability of All Hosts in the RIPng Network on page 15](#)

Checking the Routing Table

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

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

```
user@R1> show route protocol ripng
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    * [RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    * [RIPng/100] 3d 19:24:40, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:2::/64  * [RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:3::/64  * [RIPng/100] 3d 19:24:43, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:4::/64  * [RIPng/100] 3d 19:24:40, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
ff02::9/128       * [RIPng/100] 3d 19:24:47, metric 1
                  MultiRecv
```

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

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

Checking the Interface Addresses

Purpose Verify that the **eui-64** statement automatically generated the host portion of the interface address and the link-local address.

Action From operational mode, enter the **show interfaces terse** command.

```
user@R1> show interfaces terse
Interface          Admin Link Proto  Local                               Remote
fe-1/2/0
fe-1/2/0.1         up    up    inet6  2001:db8:0:1:2a0:a514:0:14c/64
                  fe80::2a0:a514:0:14c/64
lo0
lo0.1              up    up    inet6  2001:db8::1
                  fe80::2a0:a50f:fc56:14c
```

Meaning The output shows that the interface address on fe-1/2/0.1 includes both the network portion (2001:db8:0:1) and the host portion (2a0:a514:0:14c).

Also, link-local (fe80) addresses are assigned to interfaces fe-1/2/0.1 and lo0.1.

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

Purpose Verify that Device R1 is sending the expected routes.

Action From operational mode, enter the **show route advertising-protocol ripng** command, using Device R1's link-local address as the neighbor address.

```
user@R1> show route advertising-protocol ripng fe80::2a0:a514:0:14c
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::1/128    *[Direct/0] 3d 19:45:55
> via lo0.1
2001:db8:0:1::/64 *[Direct/0] 3d 19:45:55
> via fe-1/2/0.1
```

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

Verifying the RIPng-Enabled Interfaces

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

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

```
user@R1> show ripng neighbor
```

Neighbor	State	Source Address	Dest Address	Send	Recv	In Met
fe-1/2/0.1	Up	fe80::2a0:a514:0:14c	ff02::9	yes	yes	1

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

The output also shows the link-local address that is assigned to Device R2's directly connected link-local interface.

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

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

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

Purpose Verify that Device R1 is receiving the expected routes.

Action From operational mode, enter the **show route receive-protocol ripng** command, using Device R2's directly connected link-local interface address as the neighbor address.

```
user@R1> show route receive-protocol ripng fe80::2a0:a514:0:24c
inet6.0: 12 destinations, 12 routes (12 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 19:58:06, metric 3, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
```

```

2001:db8:0:2::/64 *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:3::/64 *[RIPng/100] 3d 19:58:09, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8:0:4::/64 *[RIPng/100] 3d 19:58:06, metric 3, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1

```

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

Verifying the Exchange of RIPng Messages

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

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

```

user@R1> show ripng statistics
RIPng info: port 521; holddown 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              5              0              0              0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter              Total    Last 5 min  Last minute
-----
Updates Sent          11632         10          2
Triggered Updates Sent      0          0          0
Responses Sent          0          0          0
Bad Messages           0          0          0
Updates Received        11634         11          2
Bad Route Entries        0          0          0
Updates Ignored          0          0          0
RIPng Requests Received    1          0          0
RIPng Requests Ignored    0          0          0

```

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

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

Verifying Reachability of All Hosts in the RIPng Network

Purpose By using the traceroute command on each loopback address in the network, verify that all hosts in the RIPng network are reachable from each Juniper Networks device.

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

```
user@R1> traceroute 2001:db8::3
traceroute6 to 2001:db8::3 (2001:db8::3) from 2001:db8:0:1:2a0:a514:0:14c, 64
hops max, 12 byte packets
 1 2001:db8:0:2:2a0:a514:0:24c (2001:db8:0:2:2a0:a514:0:24c) 8.881 ms 1.175
ms 1.101 ms
 2 2001:db8::3 (2001:db8::3) 1.544 ms 2.445 ms 2.043 ms
```

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

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

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

Related Documentation

- [Example: Configuring RIP](#)

Example: Applying Policies to RIPng Routes Imported from Neighbors

- [Understanding RIPng Import Policies on page 16](#)
- [Example: Applying Policies to RIPng Routes Imported from Neighbors on page 16](#)

Understanding RIPng Import Policies

The default RIPng import policy is to accept all received RIPng routes that pass a validity check. To filter routes being imported by the local routing device from its neighbors, include the **import** statement and list the names of one or more policies to be evaluated. If you specify more than one policy, they are evaluated in order (first to last) and the first matching policy is applied to the route. If no match is found, the local routing device does not import any routes.

Example: Applying Policies to RIPng Routes Imported from Neighbors

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

- [Requirements on page 16](#)
- [Overview on page 17](#)
- [Configuration on page 17](#)
- [Verification on page 20](#)

Requirements

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

Overview

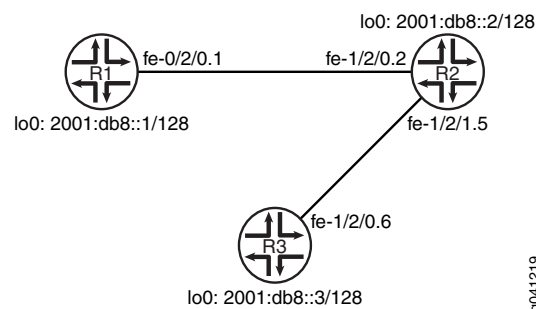
In this example, Device R2 has several extra loopback interface addresses configured to simulate additional networks.

Device R1 has an import policy that accepts the `fe80::/64` and `2001:db8::/64` routes and rejects all other routes. This means that the extra networks advertised by Device R2 are not accepted into Device R1's routing table.

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

Figure 2 on page 17 shows the topology used in this example.

Figure 2: RIPng Import Policy Network Topology



"CLI Quick Configuration" on page 17 shows the configuration for all of the devices in Figure 2 on page 17. The section "Step-by-Step Procedure" on page 18 describes the steps on Device R1.

Configuration

CLI Quick Configuration

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

```
Device R1
set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64
set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.1 import ripng-import
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
set policy-options policy-statement ripng-import term 1 from route-filter fe80::/64
  orlonger
set policy-options policy-statement ripng-import term 1 from route-filter 2001:db8::/64
  orlonger
set policy-options policy-statement ripng-import term 1 then accept
set policy-options policy-statement ripng-import term 2 then reject
```

Device R2

```
set interfaces fe-1/2/0 unit 2 description to-R1
set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db8::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db9::2/128
set interfaces lo0 unit 2 family inet6 address 2002:db7::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2
set protocols ripng group ripng-group neighbor fe-1/2/1.5
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

Device R3

```
set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
  ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

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

To configure a RIPng import policy:

1. Configure the network interfaces.

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

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128
```

2. Create the RIPng group and add the interface.

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

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

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

```
[edit policy-options policy-statement advertise-routes-through-ripng term 1]
```

```

user@R1# set from protocol direct
user@R1# set from protocol ripng
user@R1# set then accept

```

4. Apply the routing policy.

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

```

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

```

5. Configure the import policy.

```

[edit policy-options policy-statement ripng-import]
user@R1# set term 1 from route-filter fe80::/64 orlonger
user@R1# set term 1 from route-filter 2001:db8::/64 orlonger
user@R1# set term 1 then accept
user@R1# set term 2 then reject

```

6. Apply the import policy.

```

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

```

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

```

user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

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

```

```

user@R1# show policy-options
policy-statement advertise-routes-through-ripng {
  term 1 {
    from protocol [ direct ripng ];
    then accept;
  }
}
policy-statement ripng-import {
  term 1 {
    from {
      route-filter fe80::/64 orlonger;
      route-filter 2001:db8::/64 orlonger;
    }
    then accept;
  }
  term 2 {
    then reject;
  }
}

```

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

Verification

Confirm that the configuration is working properly.

- [Looking at the Neighbor Addresses for Device R2 on page 20](#)
- [Looking at the Routes That Device R2 Is Advertising to Device R1 on page 20](#)
- [Looking at the Routes That Device R1 Is Receiving from Device R2 on page 21](#)
- [Checking the Routing Table on page 21](#)

Looking at the Neighbor Addresses for Device R2

Purpose Determine the neighbor address that Device R2 is using for Device R1.

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

```
user@R2> show ripng neighbor fe-1/2/0.2
```

Neighbor	State	Source Address	Dest Address	Send	Recv	In Met
fe-1/2/0.2	Up	fe80::2a0:a514:0:24c	ff02::9	yes	yes	1

Meaning Device R2 is using the fe80::2a0:a514:0:24c address to send routes to Device R1.

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

Purpose Verify that Device R2 is sending the expected routes.

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

```

user@R2> show route advertising-protocol ripng fe80::2a0:a514:0:24c
inet6.0: 17 destinations, 18 routes (17 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

2001:db8::2/128    *[Direct/0] 3d 22:00:34
                  >   via lo0.2
2001:db8::3/128    *[RIPng/100] 3d 21:47:00, metric 2, tag 0
                  > to fe80::2a0:a514:0:64c via fe-1/2/1.5
2001:db8:0:2::/64  *[Direct/0] 3d 22:00:34
                  >   via fe-1/2/0.2
2001:db8:0:3::/64  *[Direct/0] 3d 22:00:34
                  >   via fe-1/2/1.5
2001:db8:0:4::/64  *[RIPng/100] 3d 21:47:00, metric 2, tag 0
                  > to fe80::2a0:a514:0:64c via fe-1/2/1.5
2002:db7::2/128    *[Direct/0] 00:29:05
                  >   via lo0.2
2002:db8::2/128    *[Direct/0] 00:31:49
                  >   via lo0.2
2002:db9::2/128    *[Direct/0] 00:29:05
                  >   via lo0.2

```

Meaning Device R2 is sending the extra loopback interface /128 routes to Device R1.

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

Purpose Verify that Device R1 is receiving the expected routes.

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

```

user@R1> show route receive-protocol ripng fe80::2a0:a514:0:24c

inet6.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 21:55:49, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 21:55:46, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1

```

Meaning The output shows that the extra loopback interface addresses are excluded.

Checking the Routing Table

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

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

```

user@R1> show route protocol ripng

inet6.0: 9 destinations, 9 routes (9 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::2/128    *[RIPng/100] 3d 22:01:40, metric 2, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
2001:db8::3/128    *[RIPng/100] 3d 22:01:37, metric 3, tag 0
                  > to fe80::2a0:a514:0:24c via fe-1/2/0.1
ff02::9/128       *[RIPng/100] 00:00:08, metric 1
                  MultiRecv

```

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

If you delete or deactivate the import policy, the routing table contains the extra loopback interface routes.

Related Documentation

- [Example: Configuring RIPng on page 9](#)

Example: Configuring the Metric Value Added to Imported RIPng Routes

- [Understanding RIPng Traffic Control with Metrics on page 22](#)
- [Example: Configuring the Metric Value Added to Imported RIPng Routes on page 23](#)

Understanding RIPng Traffic Control with Metrics

To tune a RIPng network and to control traffic flowing through the network, you increase or decrease the cost of the paths through the network. RIPng provides two ways to modify the path cost: an incoming metric and an outgoing metric, which are each set to 1 by default. In other words, by default, the metric of routes that RIPng imports from a neighbor or exports to a neighbor is incremented by 1. These routes include those learned from RIPng as well as those learned from other protocols. The metrics are attributes that specify the cost of any route advertised through a host. By increasing or decreasing the metrics—and thus the cost—of links throughout the network, you can control packet transmission across the network.

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

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

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

You might want to increase the metric of routes to decrease the likelihood that a particular route is selected and installed in the routing table. This process is sometimes referred to as *route poisoning*. Some reasons that you might want to poison a route are that the route is relatively expensive to use, or it has relatively low bandwidth.

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

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

Example: Configuring the Metric Value Added to Imported RIPng 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 23](#)
- [Overview on page 23](#)
- [Configuration on page 24](#)
- [Verification on page 26](#)

Requirements

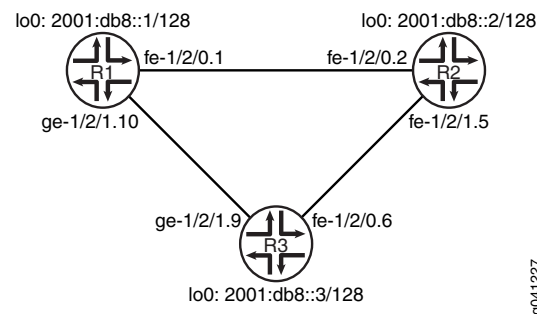
No special configuration beyond device initialization is required before configuring this example.

Overview

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

[Figure 3 on page 23](#) shows the topology used in this example.

Figure 3: RIPng Incoming Metrics Network Topology



Device R1 has two potential paths to reach 2001:db8::2/128. The default behavior is to send traffic out the 2001:db8:0:1::/64 interface facing Device R2. Suppose, though, that the path through Device R3 is less expensive to use or has higher bandwidth links. This example shows how to use the **metric-in** statement to ensure that Device R1 uses the path through Device R3 to reach 2001:db8::2/128. [“CLI Quick Configuration” on page 24](#) shows the configuration for all of the devices in [Figure 3 on page 23](#). 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	<pre>set interfaces fe-1/2/0 unit 1 description to-R2 set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64 set interfaces ge-1/2/1 unit 10 description to-R3 set interfaces ge-1/2/1 unit 10 family inet6 address 2001:db8:0:5::/64 eui-64 set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128 set protocols ripng group primary export advertise-routes-through-ripng set protocols ripng group primary neighbor ge-1/2/1.10 set protocols ripng group secondary export advertise-routes-through-ripng set protocols ripng group secondary neighbor fe-1/2/0.1 metric-in 4 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept</pre>
Device R2	<pre>set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64 set interfaces fe-1/2/1 unit 5 description to-R3 set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64 set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.2 set protocols ripng group ripng-group neighbor fe-1/2/1.5 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept</pre>
Device R3	<pre>set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64 set interfaces ge-1/2/1 unit 9 description to-R1 set interfaces ge-1/2/1 unit 9 family inet address 10.0.0.9/30 set interfaces ge-1/2/1 unit 9 family inet6 address 2001:db8:0:6::/64 eui-64 set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.6 set protocols ripng group ripng-group neighbor ge-1/2/1.9 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept</pre>

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

To configure a RIPng metrics:

1. Configure the network interfaces.

```
[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set ge-1/2/1 unit 10 description to-R3
user@R1# set ge-1/2/1 unit 10 family inet6 address 2001:db8:0:5::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128
```

2. Create the RIPng groups and add the interfaces.

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

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

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

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

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

4. Apply the routing policy.

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

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

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

```
user@R1# show interfaces
fe-1/2/0 {
  unit 1 {
    description to-R2;
    family inet6 {
      address 2001:db8:0:1::/64 {
        eui-64;
```

```
    }
  }
}
ge-1/2/1 {
  unit 10 {
    description to-R3;
    family inet6 {
      address 2001:db8:0:5::/64 {
        eui-64;
      }
    }
  }
}
lo0 {
  unit 1 {
    family inet6 {
      address 2001:db8::1/128;
    }
  }
}

user@R1# show protocols
ripng {
  group primary {
    export advertise-routes-through-ripng;
    neighbor ge-1/2/0.10;
  }
  group secondary {
    export advertise-routes-through-ripng;
    neighbor fe-1/2/0.1 {
      metric-in 4;
    }
  }
}

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

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

Verification

Confirm that the configuration is working properly.

- [Verifying That the Expected Route Is Active on page 27](#)
- [Removing the metric-in Statement on page 27](#)

Verifying That the Expected Route Is Active

- Purpose** Make sure that Device R1 uses the path through Device R3 to reach 2001:db8:0:2:2a0:a514:0:24c/128.
- Action** From operational mode, enter the **show route 2001:db8:0:2:2a0:a514:0:24c** command.
- ```
user@R1> show route 2001:db8:0:2:2a0:a514:0:24c
inet6.0: 16 destinations, 17 routes (16 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8:0:2::/64 *[RIPng/100] 01:54:35, metric 3, tag 0
> to fe80::2a0:a514:0:94c via ge-1/2/1.10
```
- Meaning** The **to fe80::2a0:a514:0:94c via ge-1/2/1.10** output shows that Device R1 uses the path through Device R3 to reach 2001:db8:0:2:2a0:a514:0:24c/128. The metric for this route is 3.

**Removing the metric-in Statement**

- Purpose** Delete or deactivate the metric-in statement to see what happens to the 2001:db8:0:2:2a0:a514:0:24c/128 route.
- Action**
- From configuration mode, deactivate the **metric-in** statement.
- ```
[edit protocols ripng group secondary neighbor fe-1/2/0.1]
user@R1# deactivate metric-in
user@R1# commit
```
- From operational mode, enter the **show route 2001:db8:0:2:2a0:a514:0:24c** command.
- ```
user@R1> show route 2001:db8:0:2:2a0:a514:0:24c
inet6.0: 16 destinations, 17 routes (16 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8:0:2::/64 *[RIPng/100] 00:00:02, metric 2, tag 0
> to fe80::2a0:a514:0:24c via fe-1/2/0.1
```
- Meaning** The **to fe80::2a0:a514:0:24c via fe-1/2/0.1** output shows that Device R1 uses the path through Device R2 to reach 2001:db8:0:2:2a0:a514:0:24c/128. The metric for this route is 2.

- Related Documentation**
- [Example: Configuring RIPng on page 9](#)

**Example: Configuring RIPng Timers**

- [Understanding RIPng Timers on page 28](#)
- [Example: Configuring RIPng Timers on page 28](#)

## Understanding RIPng Timers

You can configure various timers for RIPng.

RIPng 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 RIPng, include the **holddown** statement:

**holddown** *seconds*;

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

You can set a route timeout interval. If a route is not refreshed after being installed into the routing table by the specified time interval, the route is removed from the routing table.

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

**route-timeout** *seconds*;

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

You can set an update time interval to periodically send out routes learned by RIPng to neighbors.

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

**update-interval** *seconds*;

*seconds* can be a value from 10 through 60. The default value is 30 seconds.

## Example: Configuring RIPng Timers

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

- [Requirements on page 28](#)
- [Overview on page 28](#)
- [Configuration on page 29](#)
- [Verification on page 32](#)

---

### Requirements

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

---

### Overview

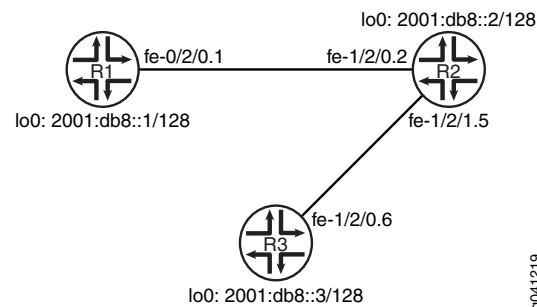
In this example, Device R2 has an update interval of 60 seconds for its neighbor Device R1, and an update interval of 10 seconds for its neighbor Device R3.

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

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

Figure 4 on page 29 shows the topology used in this example.

**Figure 4: RIPng Timers Network Topology**



“CLI Quick Configuration” on page 29 shows the configuration for all of the devices in Figure 4 on page 29. The section “Step-by-Step Procedure” on page 30 describes the steps on Device R2.

### Configuration

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

**Device R1**

```

set interfaces fe-1/2/0 unit 1 description to-R2
set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64
set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.1
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

**Device R2**

```

set interfaces fe-1/2/0 unit 2 description to-R1
set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
set interfaces fe-1/2/1 unit 5 description to-R3
set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.2 update-interval 60
set protocols ripng group ripng-group neighbor fe-1/2/1.5 update-interval 10
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct

```

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

**Device R3**

```
set interfaces fe-1/2/0 unit 6 description to-R2
set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64
set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128
set protocols ripng group ripng-group export advertise-routes-through-ripng
set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept
```

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

To configure the RIPng update interval:

1. Configure the network interfaces.

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

```
[edit interfaces]
user@R2# set fe-1/2/0 unit 2 description to-R1
user@R2# set fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64
```

```
user@R2# set fe-1/2/1 unit 5 description to-R3
user@R2# set fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64
```

```
user@R2# set lo0 unit 2 family inet6 address 2001:db8::2/128
```

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

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

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

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

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

4. Apply the routing policy.

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

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

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

```

user@R2# show interfaces
fe-1/2/0 {
 unit 2 {
 description to-R1;
 family inet6 {
 address 2001:db8:0:2::/64 {
 eui-64;
 }
 }
 }
}
fe-1/2/1 {
 unit 5 {
 description to-R3;
 family inet6 {
 address 2001:db8:0:3::/64 {
 eui-64;
 }
 }
 }
}
lo0 {
 unit 2 {
 family inet6 {
 address 2001:db8::2/128;
 }
 }
}

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

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

```

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

## Verification

Confirm that the configuration is working properly.

- [Checking the RIPng Updates Sent by Device R2 on page 32](#)
- [Checking the RIPng Updates Received by Device R2 on page 32](#)
- [Checking the RIPng Updates Received by Device R3 on page 33](#)

### Checking the RIPng Updates Sent by Device R2

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

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

```
user@R2> show ripng statistics
```

```
RIPng info: port 521; holddown 120s.
```

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

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

| Counter                 | Total | Last 5 min | Last minute |
|-------------------------|-------|------------|-------------|
| Updates Sent            | 1     | 1          | 1           |
| Triggered Updates Sent  | 0     | 0          | 0           |
| Responses Sent          | 0     | 0          | 0           |
| Bad Messages            | 0     | 0          | 0           |
| Updates Received        | 1     | 0          | 0           |
| Bad Route Entries       | 0     | 0          | 0           |
| Updates Ignored         | 0     | 0          | 0           |
| RIPng Requests Received | 0     | 0          | 0           |
| RIPng Requests Ignored  | 0     | 0          | 0           |

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

| Counter                 | Total | Last 5 min | Last minute |
|-------------------------|-------|------------|-------------|
| Updates Sent            | 6     | 2          | 2           |
| Triggered Updates Sent  | 0     | 0          | 0           |
| Responses Sent          | 0     | 0          | 0           |
| Bad Messages            | 0     | 0          | 0           |
| Updates Received        | 2     | 0          | 0           |
| Bad Route Entries       | 0     | 0          | 0           |
| Updates Ignored         | 0     | 0          | 0           |
| RIPng Requests Received | 0     | 0          | 0           |
| RIPng Requests Ignored  | 0     | 0          | 0           |

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

### Checking the RIPng Updates Received by Device R2

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



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

```
user@R1> show ripng statistics
RIPng info: port 521; holddown 120s.
 rts learned rts held down rqsts dropped resps dropped
 5 8 0 0

fe-1/2/0.1: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter Total Last 5 min Last minute

Updates Sent 6 5 2
Triggered Updates Sent 0 0 0
Responses Sent 0 0 0
Bad Messages 0 0 0
Updates Received 3 3 1
Bad Route Entries 0 0 0
Updates Ignored 0 0 0
RIPng Requests Received 0 0 0
RIPng Requests Ignored 0 0 0
```

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

#### *Checking the RIPng Updates Received by Device R3*

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

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

```
user@R3> show ripng statistics
RIPng info: port 521; holddown 120s.
 rts learned rts held down rqsts dropped resps dropped
 5 0 0 0

fe-1/2/0.6: 5 routes learned; 2 routes advertised; timeout 180s; update interval
30s
Counter Total Last 5 min Last minute

Updates Sent 5 5 2
Triggered Updates Sent 0 0 0
Responses Sent 0 0 0
Bad Messages 0 0 0
Updates Received 16 15 6
Bad Route Entries 0 0 0
Updates Ignored 0 0 0
RIPng Requests Received 0 0 0
RIPng Requests Ignored 0 0 0
```

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

**Related Documentation**

- [Example: Configuring RIPng on page 9](#)

## Example: Tracing RIPng Protocol Traffic

---

- [Understanding RIPng Protocol Traffic Trace Operations on page 34](#)
- [Example: Tracing RIPng Protocol Traffic on page 35](#)

### Understanding RIPng Protocol Traffic Trace Operations

You can trace various RIPng protocol traffic to help debug RIP protocol issues.

To trace RIP protocol traffic, include the **traceoptions** statement at the **[edit protocols ripng]** hierarchy level:

```
traceoptions {
 file filename <files number> <size size> <world-readable | no-world-readable>;
 flag flag <flag-modifier> <disable>;
}
```

You can specify the following RIPng protocol-specific trace options using the **flag** statement:

- **error**—RIPng error packets
- **expiration**—RIPng route expiration processing
- **holddown**—RIPng hold-down processing
- **nsr-synchronization**—Nonstop routing synchronization events
- **packets**—All RIPng packets
- **request**—RIPng information packets
- **trigger**—RIPng triggered updates
- **update**—RIPng update packets

You can optionally specify one or more of the following flag modifiers:

- **detail**—Detailed trace information
- **receive**—Packets being received
- **send**—Packets being transmitted



**NOTE:** Use the **detail** flag modifier with caution as this might cause the CPU to become very busy.

---

Global tracing options are inherited from the configuration set by the **traceoptions** statement at the **[edit routing-options]** hierarchy level. You can override the following global trace options for the RIPng protocol using the **traceoptions flag** statement included at the **[edit protocols ripng]** hierarchy level:

- **all**—All tracing operations
- **general**—All normal operations and routing table changes (a combination of the normal and route trace operations)
- **normal**—Normal events
- **policy**—Policy processing
- **route**—Routing information
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing



**NOTE:** Use the trace flag **all** with caution as this might cause the CPU to become very busy.

## Example: Tracing RIPng Protocol Traffic

This example shows how to trace RIPng protocol operations.

- [Requirements on page 35](#)
- [Overview on page 35](#)
- [Configuration on page 36](#)
- [Verification on page 38](#)

### Requirements

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

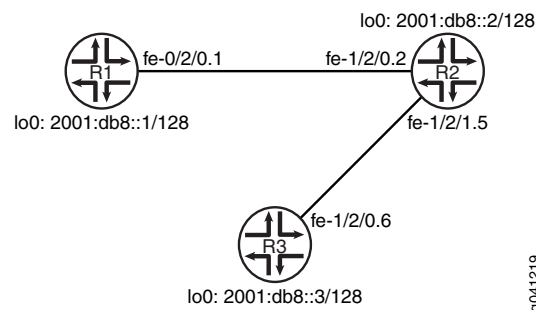
### Overview

In this example, Device R1 is set to trace routing information updates.

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

[Figure 5 on page 36](#) shows the topology used in this example.

Figure 5: RIPng Trace Operations Network Topology



“CLI Quick Configuration” on page 36 shows the configuration for all of the devices in Figure 5 on page 36. The section “Step-by-Step Procedure” on page 37 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 description to-R2 set interfaces fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64 set interfaces lo0 unit 1 family inet6 address 2001:db8::1/128 set protocols ripng traceoptions file ripng-trace-file set protocols ripng traceoptions flag route set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.1 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept </pre>                                                                                      |
| <b>Device R2</b>               | <pre> set interfaces fe-1/2/0 unit 2 description to-R1 set interfaces fe-1/2/0 unit 2 family inet6 address 2001:db8:0:2::/64 eui-64 set interfaces fe-1/2/1 unit 5 description to-R3 set interfaces fe-1/2/1 unit 5 family inet6 address 2001:db8:0:3::/64 eui-64 set interfaces lo0 unit 2 family inet6 address 2001:db8::2/128 set protocols ripng group ripng-group export advertise-routes-through-ripng set protocols ripng group ripng-group neighbor fe-1/2/0.2 set protocols ripng group ripng-group neighbor fe-1/2/1.5 set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol direct set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol ripng set policy-options policy-statement advertise-routes-through-ripng term 1 then accept </pre> |
| <b>Device R3</b>               | <pre> set interfaces fe-1/2/0 unit 6 description to-R2 set interfaces fe-1/2/0 unit 6 family inet6 address 2001:db8:0:4::/64 eui-64 set interfaces lo0 unit 3 family inet6 address 2001:db8::3/128 set protocols ripng group ripng-group export advertise-routes-through-ripng </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

```

set protocols ripng group ripng-group neighbor fe-1/2/0.6
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
 direct
set policy-options policy-statement advertise-routes-through-ripng term 1 from protocol
 ripng
set policy-options policy-statement advertise-routes-through-ripng term 1 then accept

```

### Step-by-Step Procedure

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

To configure the RIPng update interval:

1. Configure the network interfaces.

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

```

[edit interfaces]
user@R1# set fe-1/2/0 unit 1 description to-R2
user@R1# set fe-1/2/0 unit 1 family inet6 address 2001:db8:0:1::/64 eui-64

user@R1# set lo0 unit 1 family inet6 address 2001:db8::1/128

```

2. Configure the RIPng group, and add the interface to the group.

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

```

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

```

3. Configure RIPng tracing operations.

```

[edit protocols ripng traceoptions]
user@R1# set file ripng-trace-file
user@R1# set flag route

```

4. Create the routing policy to advertise both direct and RIPng-learned routes.

```

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

```

5. Apply the routing policy.

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

```

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

```

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

```
user@R1# show interfaces
fe-1/2/0 {
 unit 1 {
 description to-R2;
 family inet6 {
 address 2001:db8:0:1::/64 {
 eui-64;
 }
 }
 }
}
lo0 {
 unit 1 {
 family inet6 {
 address 2001:db8::1/128;
 }
 }
}

user@R1# show protocols
ripng {
 traceoptions {
 file ripng-trace-file;
 flag route;
 }
 group ripng-group {
 export advertise-routes-through-ripng;
 neighbor fe-1/2/0.1;
 }
}

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

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

---

### Verification

Confirm that the configuration is working properly.

#### *Checking the Log File*

**Purpose** Make sure that the RIPng route updates are logged in the configured log file.

- Action**
1. Deactivate the extra loopback interface address on Device R3.  

```
[edit interfaces lo0 unit 3 family inet6]
user@R3# deactivate address 2001:db8::3/128
user@R3# commit
```
  2. From operational mode, enter the **show log ripng-trace-file** command with the **| match 2001:db8::3** option.

```
user@R1> show log ripng-trace-file | match 2001:db8::3
```

```
Mar 6 14:57:03.516867 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:57:32.786286 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:58:02.584669 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:58:30.213894 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:59:00.115110 2001:db8::3/128: metric-in: 3, change: 3 -> 3; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:59:05.826644 Setting RIPng rtbit on route 2001:db8::3/128, tsi =
0xbb69880
Mar 6 14:59:13.014652 2001:db8::3/128: metric-in: 16, change: 3 -> 16; # gw:
1, pkt_upd_src fe80::2a0:a514:0:24c, inx: 0, rte_upd_src fe80::2a0:a514:0:24c
Mar 6 14:59:13.015132 CHANGE 2001:db8::3/128 nhid 566 gw
fe80::2a0:a514:0:24c RIPng pref 100/0 metric 3/0 fe-1/2/0.1 **Delete Int>
Mar 6 14:59:13.015197 Best route to 2001:db8::3/128 got deleted. Doing route
calculation on the stored rte-info
```

**Meaning** The output shows that the route to 2001:db8::3/128 was deleted.

**Related Documentation**

- [Example: Configuring RIPng on page 9](#)





## CHAPTER 4

# Configuration Statements

- [\[edit protocols ripng\] Hierarchy Level](#) on page 41

### [\[edit protocols ripng\] Hierarchy Level](#)

---

The following statement hierarchy can also be included at the [\[edit logical-systems \*logical-system-name\*\]](#) hierarchy level.

```
protocols {
 ripng {
 graceful-restart {
 disable;
 restart-time seconds;
 }
 group group-name {
 export [policy-names];
 import [policy-names];
 metric-out metric;
 neighbor neighbor-name {
 import [policy-names];
 metric-in metric;
 receive <none>;
 route-timeout seconds;
 send <none>;
 update-interval seconds;
 }
 preference number;
 route-timeout seconds;
 update-interval seconds;
 }
 holddown seconds;
 import [policy-names];
 metric-in metric;
 receive <none>;
 route-timeout seconds;
 send <none>;
 update-interval seconds;
 traceoptions {
 file filename <files number> <size maximum-file-size> <world-readable |
 no-world-readable>;
 flag flag <flag-modifier> <disable>;
 }
 }
}
```

```
}
}
```

**Related  
Documentation**

- Notational Conventions Used in Junos OS Configuration Hierarchies
- [edit protocols] Hierarchy Level

---

## export (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>export [ <i>policy-names</i> ];</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng <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>ripng group <i>group-name</i> ],<br>[edit protocols ripng <b>group</b> <i>group-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <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.<br>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | <p>Apply a policy or list of policies to routes being exported to the neighbors.</p> <p>By default, RIPng does not export routes it has learned to its neighbors. To have RIPng export routes, apply one or more export policies. To apply export policies and to filter routes being exported from the local routing device to its neighbors, include the <b>export</b> statement and list the name of the policy to be evaluated.</p> <p>You can define one or more export policies. If no routes match the policies, the local routing device does not export any routes to its neighbors. Export policies override any metric values determined through calculations involving the values configured with the <b>metric-in</b> and <b>metric-out</b> statements.</p> |
| <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: Configuring RIPng on page 9</a></li><li>• <a href="#">import on page 46</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## graceful-restart (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>graceful-restart {   disable;   restart-time <i>seconds</i>; }</pre>                                                                                                                                                                                                                   |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],<br>[edit protocols ripng],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng] |
| <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>Support for routing instances introduced in Junos OS Release 9.0.                                                                                              |
| <b>Description</b>              | Configure graceful restart for RIPng.                                                                                                                                                                                                                                                       |
| <b>Options</b>                  | <b>disable</b> —Disables graceful restart for RIPng.<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>Junos OS High Availability Configuration Guide</li> </ul>                                                                                                                                                                                            |

## group (Protocols RIPng)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>group <i>group-name</i> {<br/>    export [ <i>policy-names</i> ];<br/>    metric-out <i>metric</i>;<br/>    neighbor <i>neighbor-name</i> {<br/>        import <i>policy-name</i>;<br/>        metric-in <i>metric</i>;<br/>        receive &lt;none&gt;;<br/>        route-timeout <i>seconds</i>;<br/>        send &lt;none&gt;;<br/>        update-interval <i>seconds</i>;<br/>    }<br/>    preference <i>number</i>;<br/>    route-timeout <i>seconds</i>;<br/>    update-interval <i>seconds</i>;<br/>}</pre> |
| <b>Hierarchy Level</b>          | <pre>[edit logical-systems <i>logical-system-name</i> protocols ripng],<br/>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols<br/>  ripng],<br/>[edit protocols ripng],<br/>[edit routing-instances <i>routing-instance-name</i> protocols ripng]</pre>                                                                                                                                                                                                           |
| <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>Support for routing instances introduced in Junos OS Release 9.0.</p>                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>              | <p>Configure a set of RIPng neighbors that share an export policy and metric. The export policy and metric govern what routes to advertise to neighbors in a given group.</p> <p>Each group must contain at least one neighbor. You should create a group for each export policy that you have.</p>                                                                                                                                                                                                                       |
| <b>Options</b>                  | <p><b><i>group-name</i></b>—Name of a group, up to 16 characters long.</p> <p>The remaining statements are explained separately.</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 RIPng on page 9</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                    |

## holddown (Protocols RIPvng)

---

|                                 |                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>holddown seconds;</code>                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],<br>[edit protocols ripng],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng] |
| <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>Support for routing instances introduced in Junos OS Release 9.0.                                                                                              |
| <b>Description</b>              | Configure how long the expired route is retained in the routing table before being removed.                                                                                                                                                                                                 |
| <b>Options</b>                  | <b>seconds</b> —Estimated time to wait before removing expired routes from the routing table.<br><b>Default:</b> 180 seconds<br><b>Range:</b> 10 through 180 seconds                                                                                                                        |
| <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 RIPvng Timers on page 28</a></li> </ul>                                                                                                                                                                           |

## import (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>import [ <i>policy-names</i> ];</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | <code>[edit logical-systems <i>logical-system-name</i> protocols ripng],</code><br><code>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b></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>  ripng],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols</code><br><code>  ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</code><br><code>[edit protocols ripng],</code><br><code>[edit protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols ripng],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b></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>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | Apply one or more policies to routes being imported into the local routing device from its 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 RIPng Routes Imported from Neighbors on page 16</a></li><li>• <a href="#">export on page 42</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## metric-in (Protocols RIPng)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>metric-in <i>metric</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols ripng],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols ripng 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 ripng],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</p> <p>[edit protocols ripng],</p> <p>[edit protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng 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>Support for routing instances introduced in Junos OS Release 9.0.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description</b>              | Specify the metric to add to incoming routes when advertising into RIPng routes that were learned from other protocols. Use this statement to configure the routing device to prefer RIPng routes learned through a specific neighbor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring the Metric Value Added to Imported RIPng Routes on page 23</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## metric-out (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>metric-out <i>metric</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Hierarchy Level</b>          | <code>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</code><br><code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</code><br><code>[edit protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</code><br><code>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> <b>neighbor</b> <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>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>              | <p>Specify the metric value to add to routes transmitted to the neighbor. Use this statement to control how other routing devices prefer RIPng routes sent from this neighbor.</p> <p>When an export policy is configured, RIPng exports all learned routes to neighbors configured with the <b>neighbor</b> statement.</p> <p>If a route being exported was learned from a member of the same RIPng group, the metric associated with that route (unless modified by an export policy) is the normal RIPng metric. For example, a RIPng route with a metric of 5 learned from a neighbor configured with a <b>metric-in</b> value of 2 is advertised with a combined metric of 7 when advertised to RIPng neighbors in the same group. However, if this route was learned from a RIPng neighbor in a different group or from a different protocol, the route is advertised with the metric value configured for that group with the <b>metric-out</b> statement. The default value for <b>metric-out</b> is 1.</p> <p>To modify the metric for routes advertised outside a group, include the <b>metric-out</b> statement.</p> |
| <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 RIPng Routes on page 22</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



## neighbor (Protocols RIPng)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <pre>neighbor <i>neighbor-name</i> {     import [ <i>policy-names</i> ];     metric-in <i>metric</i>;     receive &lt;none&gt;;     route-timeout <i>seconds</i>;     send &lt;none&gt;;     update-interval <i>seconds</i>; }</pre>                                                                                                                                                          |
| <b>Hierarchy Level</b>          | <pre>[edit logical-systems <i>logical-system-name</i> protocols ripng group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>], [edit protocols ripng group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i>]</pre> |
| <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>Support for routing instances introduced in Junos OS Release 9.0.</p>                                                                                                                                                                                 |
| <b>Description</b>              | Configure neighbor-specific RIPng parameters, thereby overriding the defaults set for the routing device.                                                                                                                                                                                                                                                                                     |
| <b>Options</b>                  | <p><b><i>neighbor-name</i></b>—Name of an interface over which a routing device communicates to its neighbors.</p> <p>The remaining statements are explained separately.</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 RIPng on page 9</a></li> </ul>                                                                                                                                                                                                                                                                                      |

## preference (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>preference <i>preference</i>;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng <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>ripng group <i>group-name</i> ],<br>[edit protocols ripng <b>group</b> <i>group-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <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.<br>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | <p>Specify the preference of external routes learned by RIPng as compared to those learned from other routing protocols.</p> <p>By default, Junos OS assigns a preference of 100 to routes that originate from RIPng. When Junos OS determines that a route is to become the active route, the software selects the route with the lowest preference and installs this route into the forwarding table.</p> <p>To modify the default RIPng preference value, include the <b>preference</b> statement.</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>• <a href="#">Example: Configuring RIPng on page 9</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                    |

## receive (Protocols RIPng)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | receive <none>;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | <p>[edit logical-systems <i>logical-system-name</i> protocols ripng],</p> <p>[edit logical-systems <i>logical-system-name</i> protocols ripng 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 ripng],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i>],</p> <p>[edit protocols ripng],</p> <p>[edit protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <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>Support for routing instances introduced in Junos OS Release 9.0.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Description</b>              | Enable or disable receiving of update messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Options</b>                  | <p><b>none</b>—(Optional) Disable receiving update messages.</p> <p><b>Default:</b> Enabled</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="#">send on page 54</a></li> <li>• <a href="#">Example: Configuring RIPng on page 9</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## ripng

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|                                 |                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | ripng {...}                                                                                                                                                                                                                                                         |
| <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>Support for routing instances introduced in Junos OS Release 9.0.                                                                      |
| <b>Description</b>              | Enable RIPng routing on the routing device.                                                                                                                                                                                                                         |
| <b>Default</b>                  | RIPng 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 RIPng on page 9</a></li></ul>                                                                                                                                                              |

## route-timeout (Protocols RIPng)

---

|                                 |                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | route-timeout <i>seconds</i> ;                                                                                                                                                                                                                                                              |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],<br>[edit protocols ripng],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 7.6.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                  |
| <b>Description</b>              | Configure the route timeout interval for RIPng.                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <b>seconds</b> —Estimated time to wait before making updates to the routing table.<br><b>Range:</b> 30 through 360 seconds<br><b>Default:</b> 180 seconds                                                                                                                                   |
| <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 RIPng Timers on page 28</a></li></ul>                                                                                                                                                                              |

## routing-instances (Multiple Routing Entities)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 multipoint routing (MTR) is enabled.</p> |
| <b>Default</b>                  | Routing instances are disabled for the router.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Options</b>                  | <p><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.</p> <p>The remaining statements are explained separately.</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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

- Related Documentation**
- Example: Configuring Interprovider Layer 3 VPN Option A
  - Example: Configuring Interprovider Layer 3 VPN Option B
  - Example: Configuring Interprovider Layer 3 VPN Option C
  - Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX Series Routers

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## send (Protocols RIPng)

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | send <none>;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> protocols ripng 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-instances-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-name</i> ],<br>[edit protocols ripng],<br>[edit protocols ripng group <i>group-name</i> <b>neighbor</b> <i>neighbor-name</i> ],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng group <i>group-name</i> neighbor <i>neighbor-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.<br>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Description</b>              | Enable or disable sending of update messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                  | <b>none</b> —(Optional) Disable sending of update messages.<br><b>Default:</b> Enabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <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>    | • <a href="#">receive on page 51</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## traceoptions (Protocols RIPng)

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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;<i>flag-modifier</i>&gt; &lt;disable&gt;; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Hierarchy Level</b>     | <p>[edit logical-systems <i>logical-system-name</i> protocols ripng],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],</p> <p>[edit protocols ripng],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ripng]</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>Support for routing instances introduced in Junos OS Release 9.0.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>         | Set RIPng protocol-level tracing options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Default</b>             | The default RIPng 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 RIPng tracing output in the file <code>/var/log/ripng-log</code>.</p> <p><b>files <i>number</i></b>—(Optional) Maximum number of trace files. When a trace file named <b><i>trace-file</i></b> reaches its maximum size, it is renamed <b><i>trace-file.0</i></b>, then <b><i>trace-file.1</i></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>RIPng Tracing Options</b></p> <ul style="list-style-type: none"> <li>• <b>error</b>—RIPng error packets</li> <li>• <b>expiration</b>—RIPng route expiration processing</li> <li>• <b>holddown</b>—RIPng hold-down processing</li> <li>• <b>nsr-synchronization</b>—Nonstop routing synchronization events</li> <li>• <b>packets</b>—All RIPng packets</li> </ul> |

- **request**—RIPng information packets such as request, poll, and poll entry packets
- **trigger**—RIPng triggered updates
- **update**—RIPng update packets

#### Global Tracing Options

- **all**—All tracing operations
- **general**—A combination of the **normal** and **route** trace operations
- **normal**—All normal operations

**Default:** If you do not specify this option, only unusual or abnormal operations are traced.

- **policy**—Policy operations and actions
- **route**—Routing table changes
- **state**—State transitions
- **task**—Routing protocol task processing
- **timer**—Routing protocol timer processing

**flag-modifier**—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

- **detail**—Provide detailed trace information.
- **receive**—Trace the packets being received.
- **receive-detail**—Provide detailed trace information for packets being received.
- **send**—Trace the packets being transmitted.
- **send-detail**—Provide detailed trace information for packets being transmitted.

**no-world-readable**—(Optional) Do not allow any user to read the log file.

**size size**—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum file size, you must also specify a maximum number of trace files with the **files** option.

**Syntax:** **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

**Range:** 10 KB through the maximum file size supported on your system

**Default:** 128 KB

**world-readable**—(Optional) Allow any user to read the log file.

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



**Related Documentation** • [Example: Tracing RIPvng Protocol Traffic on page 35](#)

## update-interval (Protocols RIPvng)

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|                                 |                                                                                                                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | update-interval <i>seconds</i> ;                                                                                                                                                                                                                                                            |
| <b>Hierarchy Level</b>          | [edit logical-systems <i>logical-system-name</i> protocols ripng],<br>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> protocols ripng],<br>[edit protocols ripng],<br>[edit routing-instances <i>routing-instance-name</i> protocols ripng] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 7.6.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.<br>Support for routing instances introduced in Junos OS Release 9.0.                                                                                                  |
| <b>Description</b>              | Configure the interval at which routes learned by RIPvng are sent to neighbors.                                                                                                                                                                                                             |
| <b>Options</b>                  | <b>seconds</b> —Estimated time to wait before making updates to the routing table.<br><b>Range:</b> 10 through 60 seconds<br><b>Default:</b> 30 seconds                                                                                                                                     |
| <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>    | • <a href="#">Example: Configuring RIP Timers</a>                                                                                                                                                                                                                                           |



## PART 3

# Administration

- [Operational Commands on page 61](#)



## CHAPTER 5

# Operational Commands

## clear ripng general-statistics

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|                                    |                                                                                                                                                                                                           |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | clear ripng general-statistics<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                    |
| <b>Syntax (EX Series Switches)</b> | clear ripng 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.                                                                                     |
| <b>Description</b>                 | Clear RIP next generation (RIPng) general statistics.                                                                                                                                                     |
| <b>Options</b>                     | <b>none</b> —Clear RIPng 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 ripng general-statistics on page 78</a></li></ul>                                                                                                |
| <b>List of Sample Output</b>       | <a href="#">clear ripng general-statistics on page 62</a>                                                                                                                                                 |
| <b>Output Fields</b>               | When you enter this command, you are provided feedback on the status of your request.                                                                                                                     |

### Sample Output

|                                   |                                           |
|-----------------------------------|-------------------------------------------|
| clear ripng<br>general-statistics | user@host> clear ripng general-statistics |
|-----------------------------------|-------------------------------------------|

## clear ripng statistics

---

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                    | clear ripng statistics<br><instance   name><br><logical-system (all   logical-system-name)>                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switch)</b> | clear ripng statistics<br><instance   name>                                                                                                                                                                                                                                                                                                                                                                 |
| <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>               | Clear RIP next-generation (RIPng) statistics.                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                   | <p><b>none</b>—Reset RIPng counters for all neighbors for all routing instances.</p> <p><b>instance</b>—(Optional) Reset RIPng counters for the specified instance.</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>name</b>—(Optional) Reset RIPng counters for the specified neighbor.</p> |
| <b>Required Privilege Level</b>  | clear                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>     | <ul style="list-style-type: none"> <li>• <a href="#">show ripng statistics on page 81</a></li> </ul>                                                                                                                                                                                                                                                                                                        |
| <b>List of Sample Output</b>     | <a href="#">clear ripng statistics on page 63</a>                                                                                                                                                                                                                                                                                                                                                           |
| <b>Output Fields</b>             | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                       |

## Sample Output

clear ripng statistics     user@host> clear ripng statistics

## restart

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <pre>restart &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 &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; &lt;gracefully   immediately   soft&gt;</pre> |
| <b>Syntax (ACX Series Routers)</b> | <pre>restart &lt;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   mobile-ip     mountd-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&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (EX Series Switches)</b> | <pre>restart &lt;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   mountd-service   multicast-snooping   pgm     redundancy-interface-process   remote-operations   routing   secure-neighbor-discovery     service-deployment   sflow-service   snmp   vrrp   web-management&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Syntax (Routing Matrix)</b>     | <pre>restart &lt;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 &lt;logical-system   <i>logical-system-name</i>&gt;   sampling   service-deployment   snmp&gt; &lt;all   all-lcc   lcc <i>number</i>&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | <gracefully   immediately   soft>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax (J Series Routing Platform)</b> | <p>restart</p> <p>&lt;adaptive-services   audit-process   chassis-control   class-of-service   dhcp   dialer-services   dlsw   event-processing   firewall   interface-control   ipsec-key-management   isdn-signaling   l2-learning   l2tp-service   mib-process   network-access-service   pgm   ppp   pppoe   remote-operations   routing &lt;logical-system <i>logical-system-name</i>&gt;   sampling   service-deployment   snmp   usb-control   web-management&gt;</p> <p>&lt;gracefully   immediately   soft&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax (TX Matrix 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   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   mounstd-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 (J Series Routers)</b>                                                                                                                                                                                                            | <p>restart</p> <p>&lt;adaptive-services   audit-process   chassis-control   class-of-service   dhcp   dhcp-service   dialer-services   diameter-service   dlsr   event-processing   firewall   interface-control   ipsec-key-management   isdn-signaling   l2ald   l2-learning   l2tp-service   mib-process   network-access-service   pgm   ppp   pppoe   remote-operations   routing &lt;logical-system <i>logical-system-name</i>&gt;   sampling   service-deployment   snmp   usb-control   web-management&gt;</p> <p>&lt;gracefully   immediately   soft&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   dlsr   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> <p>Options added:</p> <ul style="list-style-type: none"> <li>• <b>dynamic-flow-capture</b> in Junos OS Release 7.4.</li> <li>• <b>dlsr</b> in Junos OS Release 7.5.</li> <li>• <b>event-processing</b> in Junos OS Release 7.5.</li> <li>• <b>ppp</b> in Junos OS Release 7.5.</li> <li>• <b>l2ald</b> in Junos OS Release 8.0.</li> <li>• <b>link-management</b> in Release 8.0.</li> <li>• <b>pgcp-service</b> in Junos OS Release 8.4.</li> <li>• <b>sbc-configuration-process</b> in Junos OS Release 9.5.</li> <li>• <b>services pgcp gateway</b> in Junos OS Release 9.6.</li> <li>• <b>sfc</b> and <b>all-sfc</b> for the TX Matrix Router in Junos OS Release 9.6.</li> </ul> |
| <b>Description</b>                                                                                                                                                                                                                          | Restart a Junos OS process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>CAUTION:</b> 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.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                                                                                                                                                                                                                              | none—Same as <b>gracefully</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

- 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**—(J Series routers and 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**—(J Series routers and 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**—(J Series routers and 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**—(J Series routers and 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 T1600 router that is connected to the TX Matrix Plus router. Replace **number** with a value from 0 through 3.

**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.

**mound-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**—(J Series routers and 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.

**sbcc-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 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**—(J Series routers and MX Series routers only) (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**—(J Series routers, 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 73](#)

**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

|                                    |                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | show policy<br><logical-system (all   <i>logical-system-name</i> )><br>< <i>policy-name</i> >                                                                                                                                                                                                                            |
| <b>Syntax (EX Series Switches)</b> | show policy<br>< <i>policy-name</i> >                                                                                                                                                                                                                                                                                    |
| <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 information about configured routing policies.                                                                                                                                                                                                                                                                   |
| <b>Options</b>                     | <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> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>       | <ul style="list-style-type: none"> <li>show policy damping</li> </ul>                                                                                                                                                                                                                                                    |
| <b>List of Sample Output</b>       | <a href="#">show policy on page 74</a><br><a href="#">show policy policy-name on page 75</a><br><a href="#">show policy (Multicast Scoping) on page 75</a>                                                                                                                                                               |
| <b>Output Fields</b>               | Table 3 on page 74 lists the output fields for the <b>show policy</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                   |

**Table 3: show policy Output Fields**

| Field Name         | Field Description               |
|--------------------|---------------------------------|
| <i>policy-name</i> | Name of the policy listed.      |
| <i>term</i>        | Policy term listed.             |
| <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
all_routes

show policy user@host> show policy test-statics
policy-name Policy test-statics:
 from
 3.0.0.0/8 accept
 3.1.0.0/16 accept
 then reject

show policy (Multicast user@host> show policy test-statics
Scoping) Policy test-statics:
 from
 multicast-scoping == 8
```

## 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 77</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Output Fields</b>               | <p><a href="#">Table 4 on page 76</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 4: 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 4: 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:
 4.4.4.4/32, generation 3
 6.6.6.6/32, generation 3
 10.10.10.10/32, generation 3

 Condition cond2, event: Existence of a route in a specific routing table
 Dependent routes:
 None

 Condition tables:
 Table inet.0, generation 4, dependencies 3, If-route-exists conditions: cond1
 (static) cond2 (static)
```

## show ripng general-statistics

|                                  |                                                                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                    | show ripng general-statistics<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                       |
| <b>Syntax (EX Series Switch)</b> | show ripng 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.                                                                                       |
| <b>Description</b>               | Display general RIP next-generation (RIPng) statistics.                                                                                                                                                     |
| <b>Options</b>                   | <b>none</b> —Display general RIPng 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 ripng general-statistics on page 62</a></li> </ul>                                                                                                 |
| <b>List of Sample Output</b>     | <a href="#">show ripng general-statistics on page 78</a>                                                                                                                                                    |
| <b>Output Fields</b>             | <a href="#">Table 5 on page 78</a> lists the output fields for the <b>show ripng general-statistics</b> command. Output fields are listed in the approximate order in which they appear.                    |

**Table 5: show ripng general-statistics Output Fields**

| Field Name         | Field Description                                      |
|--------------------|--------------------------------------------------------|
| <b>bad msgs</b>    | Number of invalid messages received.                   |
| <b>no rcv intf</b> | Number of packets received with no matching interface. |
| <b>curr memory</b> | Amount of memory currently used by RIPng.              |
| <b>max memory</b>  | Most memory used by RIPng.                             |

## Sample Output

```

show ripng general-statistics user@host> show ripng general-statistics
RIPng I/O info:
 bad msgs : 0
 no rcv intf : 0
 curr memory : 0
 max memory : 0

```

## show ripng neighbor

|                                  |                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                    | show ripng neighbor<br><logical-system (all   <i>logical-system-name</i> )><br>< <i>name</i> >                                                                                                                                                                                                                                   |
| <b>Syntax (EX Series Switch)</b> | show ripng neighbor<br>< <i>name</i> >                                                                                                                                                                                                                                                                                           |
| <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 information about RIP next-generation (RIPng) neighbors.                                                                                                                                                                                                                                                                 |
| <b>Options</b>                   | <p><b>none</b>—Display information about all RIPng neighbors.</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 a specific RIPng neighbor.</p> |
| <b>Required Privilege Level</b>  | view                                                                                                                                                                                                                                                                                                                             |
| <b>List of Sample Output</b>     | <a href="#">show ripng neighbor on page 79</a>                                                                                                                                                                                                                                                                                   |
| <b>Output Fields</b>             | <a href="#">Table 6 on page 79</a> lists the output fields for the <b>show ripng neighbor</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                   |

**Table 6: show ripng neighbor Output Fields**

| Field Name                 | Field Description                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Neighbor</b>            | Name of RIPng neighbor.                                                                                    |
| <b>State</b>               | State of the connection: <b>Up</b> or <b>Dn</b> (Down).                                                    |
| <b>Source Address</b>      | Source address.                                                                                            |
| <b>Destination Address</b> | Destination address.                                                                                       |
| <b>Send</b>                | Send options: <b>broadcast</b> , <b>multicast</b> , <b>none</b> , <b>version 1</b> , or <b>yes</b> .       |
| <b>Recv</b>                | Type of packets to accept: <b>both</b> , <b>none</b> , <b>version 1</b> , or <b>yes</b> .                  |
| <b>In Met</b>              | Metric added to incoming routes when advertising into RIPng routes that were learned from other protocols. |

## Sample Output

```
show ripng neighbor user@host> show ripng neighbor
```

| Neighbor<br>----- | State<br>----- | Source<br>Address<br>----- | Dest<br>Address<br>----- | Send | Recv | In<br>Met<br>----- |
|-------------------|----------------|----------------------------|--------------------------|------|------|--------------------|
| fe-0/0/2.0        | Up             | fe80::290:69ff:fe68:b002   | ff02::9                  | yes  | yes  | 1                  |



## show ripng statistics

|                                  |                                                                                                                                                                                                                                                                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                    | show ripng statistics<br><logical-system (all   <i>logical-system-name</i> )><br>< <i>name</i> >                                                                                                                                                                                                                              |
| <b>Syntax (EX Series Switch)</b> | show ripng statistics<br>< <i>name</i> >                                                                                                                                                                                                                                                                                      |
| <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 RIP next generation (RIPng) 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 RIPng statistics for all neighbors.</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 a specific RIPng neighbor.</p> |
| <b>Required Privilege Level</b>  | view                                                                                                                                                                                                                                                                                                                          |
| <b>Related Documentation</b>     | <ul style="list-style-type: none"> <li>• <a href="#">clear ripng statistics on page 63</a></li> </ul>                                                                                                                                                                                                                         |
| <b>List of Sample Output</b>     | <a href="#">show ripng statistics on page 82</a>                                                                                                                                                                                                                                                                              |
| <b>Output Fields</b>             | <a href="#">Table 7 on page 81</a> lists the output fields for the <b>show ripng statistics</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                              |

**Table 7: show ripng statistics Output Fields**

| Field Name | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RIPng info | <p>Information about RIPng on the specified interface:</p> <ul style="list-style-type: none"> <li>• <b>port</b>—UDP port number used for RIPng.</li> <li>• <b>holddown</b>—Hold-down interval, in seconds.</li> <li>• <b>rts learned</b>—Number of routes learned through RIPng.</li> <li>• <b>rts held down</b>—Number of routes held down by RIPng.</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> <li>• <b>restart</b>—Graceful restart status. Displayed when RIPng is or has been in the process of graceful restart.</li> </ul> |

Table 7: show ripng statistics Output Fields (*continued*)

| Field Name               | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>logical-interface</i> | <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> <li><b>timeout</b>—Timeout interval, in seconds.</li> <li><b>update interval</b>—Interval between routing table updates, in seconds.</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>Updates Received</b>—Number of RIPng update messages received.</li> <li><b>Bad Route Entries</b>—Number of RIPng invalid route entry messages received.</li> <li><b>Updates Ignored</b>—Number of RIPng update messages ignored.</li> <li><b>RIPng Requests Received</b>—Number of RIPng request messages received.</li> <li><b>RIPng Requests Ignored</b>—Number of RIPng 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 ripng statistics user@host> show ripng statistics
RIPng info: port 521; holddown 120s;
 rts learned rts held down rqsts dropped resps dropped
 0 0 0 0

so-0/1/3.0: 0 routes learned; 1 routes advertised; timeout 180s; update interval
20s
Counter Total Last 5 min Last minute

Updates Sent 934 16 4
Triggered Updates Sent 1 0 0
Responses Sent 0 0 0
Bad Messages 0 0 0
Updates Received 0 0 0
Bad Route Entries 0 0 0
Updates Ignored 0 0 0
RIPng Requests Received 0 0 0
RIPng Requests Ignored 0 0 0

```

## show route

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <pre>show route &lt;all&gt; &lt;destination-prefix&gt; &lt;logical-system (all   logical-system-name)&gt; &lt;private&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax (EX Series Switches)</b> | <pre>show route &lt;all&gt; &lt;destination-prefix&gt; &lt;private&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>Option <b>private</b> introduced in Junos OS Release 9.5.</p> <p>Option <b>private</b> introduced in Junos OS Release 9.5 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                  |
| <b>Description</b>                 | Display the active entries in the routing tables.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                     | <p><b>none</b>—Display brief information about all active entries in the routing tables.</p> <p><b>all</b>—(Optional) Display information about all routing tables, including private, or internal, routing tables.</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> <p><b>private</b>—(Optional) Display information only about all private, or internal, routing tables.</p> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Related Documentation</b>       | <ul style="list-style-type: none"> <li>• Example: Configuring RIP</li> <li>• <a href="#">Example: Configuring RIPv6 on page 9</a></li> <li>• Example: Configuring IS-IS</li> <li>• Examples: Configuring Internal BGP Peering</li> <li>• Examples: Configuring External BGP Peering</li> <li>• Examples: Configuring OSPF Routing Policy</li> </ul>                                                                                                                                                                                                                                                        |
| <b>List of Sample Output</b>       | <p><a href="#">show route on page 86</a></p> <p><a href="#">show route destination-prefix on page 86</a></p> <p><a href="#">show route extensive on page 86</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**Output Fields** Table 8 on page 84 describes the output fields for the **show route** command. Output fields are listed in the approximate order in which they appear.

**Table 8: 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> |
| <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>                                                                                                                                                                      |
| <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 8: show route Output Fields (*continued*)

| Field Name                                        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>weeks:days</i><br><i>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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <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>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>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 8: show route Output Fields (*continued*)

| Field Name | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| via        | <p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the interface that is actually used is followed by the word <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).</li> </ul> |

## 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 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 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 225.1.1.1

```

```
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: 65500 Peer AS: 65500
Age: 3 Metric2: 1
Task: BGP_65500.10.0.0.30+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:65520:100
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 active-path

|                                    |                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | show route active-path<br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                     |
| <b>Syntax (EX Series Switches)</b> | show route active-path<br><brief   detail   extensive   terse>                                                                                                                                                                                                                                                                                                                             |
| <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>                     | <p><b>none</b>—Display all active routes.</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>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 active-path on page 88</a><br><a href="#">show route active-path brief on page 89</a><br><a href="#">show route active-path detail on page 89</a><br><a href="#">show route active-path extensive on page 90</a><br><a href="#">show route active-path terse on page 91</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

```

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 100.1.2.1 via so-2/1/3.0
100.1.2.0/24 * [Direct/0] 00:18:36
 > via so-2/1/3.0
100.1.2.2/32 * [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 88](#).

**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: 100.1.2.1 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

100.1.2.0/24 (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

100.1.2.2/32 (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 -> {100.1.2.1}
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: 100.1.2.1 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

```

```

100.1.2.0/24 (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

100.1.2.2/32 (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   |          |          | >100.0   |         |

|                    |   |    |    |             |
|--------------------|---|----|----|-------------|
| * 10.255.71.50/32  | I | 15 | 10 | >100.1.2.1  |
| * 100.1.2.0/24     | D | 0  |    | >so-2/1/3.0 |
| * 100.1.2.2/32     | 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>                   | <code>show route advertising-protocol <i>protocol</i> <i>neighbor-address</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>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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• Example: Configuring the MED Attribute Directly</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>List of Sample Output</b>    | <a href="#">show route advertising-protocol bgp (Layer 3 VPN) on page 95</a><br><a href="#">show route advertising-protocol bgp detail on page 95</a><br><a href="#">show route advertising-protocol bgp detail (Layer 2 VPN) on page 96</a><br><a href="#">show route advertising-protocol bgp detail (Layer 3 VPN) on page 96</a><br><a href="#">show route advertising-protocol bgp extensive all (Next Hop Self with RIB-out IP Address) on page 96</a>                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Output Fields</b>            | Table 9 on page 94 lists the output fields for the <b>show route advertising-protocol</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table 9: 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 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 an RSVP or an LDP 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 96. | All levels              |
| <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              |

Table 9: show route advertising-protocol Output Fields (*continued*)

| Field Name          | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Level of Output  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 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>?</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       |
| Communities         | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | detail extensive |
| AIGP                | Accumulated interior gateway protocol (AIGP) BGP attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | detail extensive |
| Attrset AS          | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | detail extensive |
| Layer2-info: encaps | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | detail extensive |
| control flags       | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | detail extensive |
| mtu                 | Maximum transmission unit (MTU) of the Layer 2 circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | detail extensive |

## Sample Output

```

show route advertising-protocol bgp (Layer 3 VPN)
user@host> show route advertising-protocol bgp 10.255.14.171
VPN-A.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix Nexthop MED Lclpref AS path
10.255.14.172/32 Self 1 100 I
VPN-B.inet.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
Prefix Nexthop MED Lclpref AS path
10.255.14.181/32 Self 2 100 I

show route advertising-protocol bgp detail
user@host> show route advertising-protocol bgp 111.222.1.3 detail
bgp20.inet.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
111.222.1.11/32 (1 entry, 1 announced)
 BGP group pe-pe type Internal

```

```

Route Distinguisher: 111.255.14.11:69
Advertised Label: 100000
next hop: Self
Localpref: 100
AS path: 2 I
Communities: target:69:20
AIGP 210
111.8.0.0/16 (1 entry, 1 announced)
BGP group pe-pe type Internal
Route Distinguisher: 111.255.14.11:69
Advertised Label: 100000
Next hop: Self
Localpref: 100
AS path: 2 I
Communities: target:69:20
AIGP 210

show route user@host> show route advertising-protocol bgp 192.168.24.1 detail
advertising-protocol vpn-a.12vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
bgp detail (Layer 2 192.168.16.1:1:1/96 (1 entry, 1 announced)
VPN) 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 user@host> show route advertising-protocol bgp 10.255.14.176 detail
advertising-protocol vpnna.inet.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
bgp detail (Layer 3 * 10.49.0.0/30 (1 entry, 1 announced)
VPN) 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 user@host> show route advertising-protocol bgp 200.0.0.2 170.0.1.0/24 extensive all
advertising-protocol inet.0: 13 destinations, 19 routes (13 active, 0 holddown, 6 hidden)
bgp extensive all (Next 170.0.1.0/24 (2 entries, 1 announced)
Hop Self with RIB-out BGP group eBGP-INTEROP type External
IP Address) Nexthop: Self (rib-out 10.100.3.2)
AS path: [4713] 200 I
...
```



## show route all

|                                    |                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <code>show route all</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                                                                                         |
| <b>Syntax (EX Series Switches)</b> | <code>show route all</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>                 | Display information about all routes in all routing tables, including private, or internal, tables.                                                                                                                                                                                                                                           |
| <b>Options</b>                     | <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.                                                                 |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                          |
| <b>List of Sample Output</b>       | <a href="#">show route all on page 97</a>                                                                                                                                                                                                                                                                                                     |
| <b>Output Fields</b>               | 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
```

```

1 Receive
 *[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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <code>show route best <i>destination-prefix</i></code><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                           |
| <b>Syntax (EX Series Switches)</b> | <code>show route best <i>destination-prefix</i></code><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 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.                                                                                                                                                                                                                                                      |
| <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><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. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>List of Sample Output</b>       | <a href="#">show route best on page 99</a><br><a href="#">show route best detail on page 100</a><br><a href="#">show route best extensive on page 100</a><br><a href="#">show route best terse on page 101</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

```

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 100](#).

```

show route best terse user@host> show route best 10.255.70.103 terse
inet.0: 24 destinations, 25 routes (23 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
* 10.255.70.103/32 0 10 2 >10.31.1.6
 so-0/3/0.0

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
* 10.255.70.103/32 R 7 2 >so-0/3/0.0

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
* 10.0.0.0/8 D 0 0 >fxp2.0
 D 0 0 >fxp1.0

```

## show route brief

|                                    |                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>                     | <p><b>none</b>—Display all active entries in the routing table.</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 brief on page 102</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

```

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
224.0.0.5/32 *[OSPF/10] 1w5d 20:30:29, metric 1
 MultiRecv
```

## show route detail

|                                    |                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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.                                                                                                                                                                                                                                       |
| <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 112</a><br><a href="#">show route detail (with BGP Multipath) on page 118</a>                                                                                                                                                                                                                                         |
| <b>Output Fields</b>               | <p><a href="#">Table 10 on page 104</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.</p>                                                                                                                                                                   |

Table 10: 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 10: show route detail 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> </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>                                                                                                                                                                                                                           |
| Level                                          | <p>(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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Route Distinguisher                            | IP subnet augmented with a 64-bit prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Next-hop type                                  | Type of next hop. For a description of possible values for this field, see <a href="#">Table 11 on page 108</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Table 10: show route detail Output Fields (*continued*)

| Field Name                                           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 12 on page 110</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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Metricn</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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Table 10: show route detail Output Fields (*continued*)

| Field Name                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>              | <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <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 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> |
| <b>VC Label</b>                | MPLS label assigned to the Layer 2 circuit virtual connection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MTU</b>                     | Maximum transmission unit (MTU) of the Layer 2 circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>VLAN ID</b>                 | VLAN identifier of the Layer 2 circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Prefixes bound to route</b> | Forwarding equivalent class (FEC) bound to this route. Applicable only to routes installed by LDP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Communities</b>             | Community path attribute for the route. See <a href="#">Table 13 on page 112</a> for all possible values for this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Layer2-info: encaps</b>     | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Table 10: show route detail Output Fields (*continued*)

| Field Name                       | Field Description                                                                                                                                                      |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>control flags</b>             | Control flags: <b>none</b> or <b>Site Down</b> .                                                                                                                       |
| <b>mtu</b>                       | Maximum transmission unit (MTU) information.                                                                                                                           |
| <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 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 11 on page 108](#) describes all possible values for the **Next-hop Types** output field.

Table 11: 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.                                                                                                                                                                                                                                                              |
| <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.                                                                                                                                                                                                                                                              |

Table 11: Next-hop Types Output Field Values (*continued*)

| Next-Hop Type                   | Description                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 <b>router</b> next hop, the <b>interface</b> 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.                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Unicast (ucst)</b>           | Unicast.                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Unilist (ulst)</b>           | List of unicast next hops. A packet sent to this next hop goes to any next hop in the list.                                                                                                                                                                                                                                                                                                                |

Table 12 on page 110 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 12: State Output Field Values

| Value                                                    | Description                                                                                                                                                                          |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accounting</b>                                        | Route needs accounting.                                                                                                                                                              |
| <b>Active</b>                                            | Route is active.                                                                                                                                                                     |
| <b>Always Compare MED</b>                                | Path with a lower multiple exit discriminator (MED) is available.                                                                                                                    |
| <b>AS path</b>                                           | Shorter AS path is available.                                                                                                                                                        |
| <b>Cisco Non-deterministic MED selection</b>             | Cisco nondeterministic MED is enabled, and a path with a lower MED is available.                                                                                                     |
| <b>Clone</b>                                             | Route is a clone.                                                                                                                                                                    |
| <b>Cluster list length</b>                               | Length of cluster list sent by the route reflector.                                                                                                                                  |
| <b>Delete</b>                                            | Route has been deleted.                                                                                                                                                              |
| <b>Ex</b>                                                | Exterior route.                                                                                                                                                                      |
| <b>Ext</b>                                               | BGP route received from an external BGP neighbor.                                                                                                                                    |
| <b>FlashAll</b>                                          | 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. |
| <b>Hidden</b>                                            | Route not used because of routing policy.                                                                                                                                            |
| <b>IfCheck</b>                                           | Route needs forwarding RPF check.                                                                                                                                                    |
| <b>IGP metric</b>                                        | Path through next hop with lower IGP metric is available.                                                                                                                            |
| <b>Inactive reason</b>                                   | Flags for this route, which was not selected as best for a particular destination.                                                                                                   |
| <b>Initial</b>                                           | Route being added.                                                                                                                                                                   |
| <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).                                                                                                                        |

Table 12: State Output Field Values (*continued*)

| Value                                 | Description                                                                                                                                                                                                                       |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>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.                                                                                                                                                                               |
| <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 13 on page 112 describes the possible values for the **Communities** output field.

Table 13: 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.                                                  |
| <i>bandwidth: 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.                   |
| <i>domain-id</i>                                        | Unique configurable number that identifies the OSPF domain.                                                                                                                                                                                                                                             |
| <i>domain-id-vendor</i>                                 | 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.                                                                                                                        |
| <i>origin</i>                                           | (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. |
| <i>route-type-vendor</i>                                | Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute <b>0x8000</b> . The format is <i>area-number:ospf-route-type:options</i> .                                                                                            |
| <i>rte-type</i>                                         | Displays the area number, OSPF route type, and option of the route. This is configured using the BGP extended community attribute <b>0x0306</b> . The format is <i>area-number:ospf-route-type:options</i> .                                                                                            |
| <i>target</i>                                           | Defines which VPN the route participates in; <b>target</b> has the format <i>32-bit IP address:16-bit number</i> . For example, 10.19.0.0:100.                                                                                                                                                          |
| <i>unknown IANA</i>                                     | Incoming IANA codes with a value between <b>0x1</b> and <b>0x7fff</b> . This code of the BGP extended community attribute is accepted, but it is not recognized.                                                                                                                                        |
| <i>unknown OSPF vendor community</i>                    | Incoming IANA codes with a value above <b>0x8000</b> . 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
 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
 Task: OSPF
 Announcement bits (2): 0-KRT 3-Resolve tree 2
 AS path: I

...

```

```

224.0.0.2/32 (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

...

224.0.0.22/32 (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)
299776 (1 entry, 1 announced)
TSI:
KRT in-kernel 299776 /52 -> {Flood}
 *RSVP Preference: 7
 Next hop type: Flood
 Next-hop reference count: 130
 Flood nexthop branches exceed maximum
 Address: 0x8ea65d0

...

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: 12 circuit
Announcement bits (1): 0-LDP
AS path: I
VC Label 100000, MTU 1500, VLAN ID 512
```

**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
Task: BGP_2.10.1.1.2+59955
Announcement bits (1): 0-KRT
AS path: 2 I
Accepted Multipath
Localpref: 100
Router ID: 1.1.1.2
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
Task: BGP_2.10.1.1.6+58198
AS path: 2 I
Accepted MultipathContrib
Localpref: 100
Router ID: 1.1.1.3
```

## show route exact

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | <code>show route exact <i>destination-prefix</i></code><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                          |
| <b>Syntax (EX Series Switches)</b> | <code>show route exact <i>destination-prefix</i></code><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><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. |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>List of Sample Output</b>       | <a href="#">show route exact on page 119</a><br><a href="#">show route exact detail on page 119</a><br><a href="#">show route exact extensive on page 120</a><br><a href="#">show route exact terse on page 120</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

|                                |                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>show route exact</b>        | <pre> user@host&gt; 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                   &gt; to 192.168.71.254 via fxp0.0 </pre>                                                                                                 |
| <b>show route exact detail</b> | <pre> user@host&gt; 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: &lt;Active NoReadvrt Int Ext&gt;         Local AS:    69 </pre> |

```
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
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>Syntax</b>                      | show route export<br><brief   detail><br><instance <instance-name>   routing-table-name><br><logical-system (all   logical-system-name)>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Syntax (EX Series Switches)</b> | show route export<br><brief   detail><br><instance <instance-name>   routing-table-name>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <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 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 122</a><br><a href="#">show route export detail on page 122</a><br><a href="#">show route export instance detail on page 122</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Output Fields</b>               | Table 14 on page 121 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 14: show route export Output Fields

| Field Name                        | Field Description                                                                                                                                           | Level of Output   |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Table</b> or <b>table-name</b> | Name of the routing tables that either import or export routes.                                                                                             | All levels        |
| <b>Routes</b>                     | 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 |
| <b>Export</b>                     | Whether the table is currently exporting routes to other tables: <b>Y</b> or <b>N</b> (Yes or No).                                                          | <b>brief</b> none |

Table 14: show route export Output Fields (*continued*)

| Field Name           | Field Description                                                                                                                                                                                                                                                                                                                                                           | Level of Output |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>Import</b>        | Tables currently importing routes from the originator table. (Not displayed for tables that are not exporting any routes.)                                                                                                                                                                                                                                                  | <b>detail</b>   |
| <b>Flags</b>         | ( <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>   |
| <b>Options</b>       | ( <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>   |
| <b>Import policy</b> | ( <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>   |
| <b>Instance</b>      | ( <b>instance</b> keyword only) Name of the routing instance.                                                                                                                                                                                                                                                                                                               | <b>detail</b>   |
| <b>Type</b>          | ( <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 user@host> show route export detail
detail
inet.0 Routes: 0
black.inet.0 Routes: 3
 Import: [inet.0]
red.inet.0 Routes: 4
 Import: [inet.0]

show route export user@host> show route export instance detail
instance detail
Instance: master Type: forwarding
 Flags: <config auto-policy> Options: <unicast multicast>
 Import policy: [(ospf-master-from-red || isis-master-from-black)]
Instance: black Type: non-forwarding
Instance: red Type: non-forwarding

```

## show route extensive

|                                    |                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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>                     | <p><b>none</b>—Display all active entries in the routing table.</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 extensive on page 128</a><br><a href="#">show route extensive (Access Route) on page 134</a><br><a href="#">show route extensive (Route Reflector) on page 135</a><br><a href="#">show route extensive (FRR and LFA) on page 135</a><br><a href="#">show route extensive (FRR and LFA) on page 136</a>                |
| <b>Output Fields</b>               | Table 15 on page 123 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 15: 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.                                                                                                                                                                                                                                                                                            |
| <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 extensive 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 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).</li> <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> |
| TSI                                            | Protocol header information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| label stacking                                 | <p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> <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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| [ <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>                                                                                                                                                                                  |
| Level                                          | <p>(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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Route Distinguisher                            | IP subnet augmented with a 64-bit prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Table 15: show route extensive 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 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 <i>lsp-path-name</i></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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <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>                            | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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

| Field Name             | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Session ID</b>      | The BFD session ID number that represents the protection using MPLS fast reroute (FRR) and loop-free alternate (LFA).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Inactive reason</b> | <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> |
| <b>Local AS</b>        | Autonomous system (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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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

| Field Name              | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Task                    | Name of the protocol that has added the route.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Announcement bits       | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 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 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> |
| AS path: I <Originator> | (For route reflected output only) Originator ID attribute set by the route reflector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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

| Field Name                   | Field Description                                                                                                                                                                                                                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Layer2-info: encaps</b>   | Layer 2 encapsulation (for example, VPLS).                                                                                                                                                                                                                                                                       |
| <b>control flags</b>         | Control flags: <b>none</b> or Site Down.                                                                                                                                                                                                                                                                         |
| <b>mtu</b>                   | Maximum transmission unit (MTU) information.                                                                                                                                                                                                                                                                     |
| <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>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)
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: 29
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 1:34:06
 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: 1:32:40
 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: 69
 Age: 1:32:40 Metric: 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: 1:32:43
 Task: IF
 Announcement bits (1): 3-Resolve tree 2
 AS path: I

...

10.31.2.0/30 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.31.2.0/30 -> {10.31.1.6}
 *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: 1:32:19 Metric: 2
 Area: 0.0.0.0
 Task: OSPF
 Announcement bits (2): 0-KRT 3-Resolve tree 2
 AS path: I

...

224.0.0.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 224.0.0.2/32 -> {}
 *PIM Preference: 0
 Next-hop reference count: 18
 State: <Active NoReadvrt Int>
 Local AS: 69
 Age: 1:34:08
 Task: PIM Recv
 Announcement bits (2): 0-KRT 3-Resolve tree 2
 AS path: I

...

```

```

224.0.0.22/32 (1 entry, 1 announced)
TSI:
KRT in-kerne1 224.0.0.22/32 -> {}
 *IGMP Preference: 0
 Next-hop reference count: 18
 State: <Active NoReadvrt Int>
 Local AS: 69
 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)

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: 1:28:12 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: 1:28:12 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: 69
 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: 69
 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)
299776 (1 entry, 1 announced)
TSI:
KRT in-kernel 299776 /52 -> {Flood}
 *RSVP Preference: 7
 Next hop type: Flood
 Next-hop reference count: 130
 Flood nexthop branches exceed maximum
 Address: 0x8ea65d0

...

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: 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: 1:31:53 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: 10.255.70.103 Metric: 2
 Push 800012

```

```

Indirect next hop: 87272e4 1048574
Indirect path forwarding next hops: 1
 Next hop: 10.31.1.6 via ge-3/1/0.0 weight 0x1
10.255.70.103/32 Originating RIB: inet.3
 Metric: 2 Node path count: 1
 Forwarding nexthops: 1
 Nexthop: 10.31.1.6 via ge-3/1/0.0

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: 1:34:07
 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: 69
 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: 69
 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: 69
 Age: 1:34:08
 Task: PIM Recv6
 Announcement bits (1): 0-KRT
 AS path: I

ff02::16/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::16/128 -> {}
 *MLD Preference: 0
 Next-hop reference count: 18

```

```

 State: <Active NoReadvrt Int>
 Local AS: 69
 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)

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: 1:28:12 Metric2: 1
 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)
TSI:
Page 0 idx 0 Type 1 val 8699540
 *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: 1:34:03 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

10.255.71.52:1:5:1/96 (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: 10.255.71.52
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+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:

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

55.0.0.0/24 (1 entry, 1 announced)
TSI:
KRT queued (pending) add
 55.0.0.0/24 -> {Push 300112}
 *BGP Preference: 170/-101
 Next hop type: Router
 Address: 0x925c208
 Next-hop reference count: 2
 Source: 10.0.0.9
 Next hop: 10.0.0.9 via ge-1/2/0.15, selected
 Label operation: Push 300112
 Label TTL action: prop-ttl
 State: <Active Ext>
 Local AS: 7019 Peer AS: 13979
 Age: 1w0d 23:06:56
 AIGP: 25
 Task: BGP_13979.10.0.0.9+56732
 Announcement bits (1): 0-KRT
 AS path: 13979 7018 I
 Accepted
 Route Label: 300112
 Localpref: 100
 Router ID: 10.9.9.1

show route extensive user@host> show route 13.160.0.102 extensive
(Access Route) inet.0: 39256 destinations, 39258 routes (39255 active, 0 holddown, 1 hidden)
13.160.0.102/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 13.160.0.102/32 -> {13.160.0.2}

```

```

OSPF area : 0.0.0.0, LSA ID : 13.160.0.102, LSA type : Extern
 *Access Preference: 13
 Next-hop reference count: 78472
 Next hop: 13.160.0.2 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

```

**show route extensive**    user@host> **show route extensive**  
**(Route Reflector)**    1.0.0.0/8 (1 entry, 1 announced)

```

TSI:
KRT in-kernel 1.0.0.0/8 -> {indirect(40)}
 *BGP Preference: 170/-101
 Source: 192.168.4.214
 Protocol next hop: 207.17.136.192 Indirect next hop: 84ac908 40
 State: <Active Int Ext>
 Local AS: 10458 Peer AS: 10458
 Age: 3:09 Metric: 0 Metric2: 0
 Task: BGP_10458.192.168.4.214+1033
 Announcement bits (2): 0-KRT 4-Resolve inet.0
 AS path: 3944 7777 I <Originator>
 Cluster list: 1.1.1.1
 Originator ID: 10.255.245.88
 Communities: 7777:7777
 Localpref: 100
 Router ID: 4.4.4.4
 Indirect next hops: 1
 Protocol next hop: 207.17.136.192 Metric: 0
 Indirect next hop: 84ac908 40
 Indirect path forwarding next hops: 0
 Next hop type: Discard

```

**show route extensive**    user@host> **show route 20:31:2:0 extensive**  
**(FRR and LFA)**    inet.0: 46 destinations, 49 routes (45 active, 0 holddown, 1 hidden)  
                   20.31.2.0/24 (2 entries, 1 announced)  
                   State: FlashAll

```

TSI:
KRT in-kernel 20.31.2.0/24 -> {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: 10.31.1.2 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: 10.31.2.2 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: 100
 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: 10.31.1.2 via ge-2/1/8.0, selected
 Session Id: 0x201
 State: Int
 Inactive reason: Route Preference
 Local AS: 100
 Age: 5:35 Metric: 3
 Area: 0.0.0.0
 Task: OSPF
 AS path: I

```

**show route extensive  
(FRR and LFA)**

```

user@host> show route 20.31.2.0 extensive
inet.0: 46 destinations, 49 routes (45 active, 0 holddown, 1 hidden)
20.31.2.0/24 (2 entries, 1 announced)
 State: FlashAll
 TSI:
 KRT in-kernel 20.31.2.0/24 -> {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: 10.31.1.2 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: 10.31.2.2 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: 100
 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: 10.31.1.2 via ge-2/1/8.0, selected
 Session Id: 0x201
 State: Int
 Inactive reason: Route Preference
 Local AS: 100
 Age: 5:35 Metric: 3
 Area: 0.0.0.0
 Task: OSPF
 AS path: I

```



## show route forwarding-table

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                     | <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>                                                                                     |
| <b>Syntax (MX Series Routers)</b> | <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> |
| <b>Syntax (Routing Matrix)</b>    | <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>                                                                                                                                                         |
| <b>Release Information</b>        | <p>Command introduced before Junos OS Release 7.4.</p> <p>Option <b>bridge-domain</b> introduced in Junos OS Release 7.5</p> <p>Option <b>learning-vlan-id</b> introduced in Junos OS Release 8.4</p> <p>Options <b>all</b> and <b>vlan</b> introduced in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.3 for the QFX Series.</p>                                                                                                                                                                                |

**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**—(Routing Matrix only) (Optional) On a routing matrix composed of a TX Matrix Plus router and T640 routers configured in the routing matrix, 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 routers configured in the routing matrix, display information for the specified T1600 router (or line-card chassis) connected to the TX Matrix Plus router. Replace **number** with a value from 0 through 3.

**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 142](#)  
[show route forwarding-table detail on page 143](#)  
[show route forwarding-table destination extensive \(Weights and Balances\) on page 143](#)  
[show route forwarding-table extensive on page 144](#)  
[show route forwarding-table extensive \(RPF\) on page 145](#)  
[show route forwarding-table family mpls on page 146](#)  
[show route forwarding-table family vpls on page 146](#)  
[show route forwarding-table family vpls extensive on page 146](#)  
[show route forwarding-table table default on page 147](#)  
[show route forwarding-table table](#)  
[logical-system-name/routing-instance-name on page 148](#)  
[show route forwarding-table vpn on page 149](#)

**Output Fields** [Table 16 on page 139](#) 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 16: 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</b> <b>extensive</b> |

Table 16: show route forwarding-table Output Fields (*continued*)

| Field Name                     | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Level of Output         |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Route Type (Type)</b>       | <p>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):</p> <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              |
| <b>Route Reference (RtRef)</b> | Number of routes to reference.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>detail extensive</b> |
| <b>Flags</b>                   | <p>Route type flags:</p> <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 interface-number</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>                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>extensive</b>        |
| <b>Next hop</b>                | IP address of the next hop to the destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>detail extensive</b> |

Table 16: show route forwarding-table Output Fields (*continued*)

| Field Name                        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Level of Output              |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Next hop Type (Type)</b>       | <p>Next-hop type. When the <b>detail</b> keyword is used, the next-hop type might be abbreviated (as indicated in parentheses):</p> <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 (mcrst)</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> | <b>detail extensive</b>      |
| <b>Index</b>                      | Software index of the next hop that is used to route the traffic for a given prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>detail extensive none</b> |
| <b>Route interface-index</b>      | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>extensive</b>             |
| <b>Reference (NhRef)</b>          | Number of routes that refer to this next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>detail extensive none</b> |
| <b>Next-hop interface (Netif)</b> | Interface used to reach the next hop.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>detail extensive none</b> |
| <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 (see the <b>Balance</b> field description).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>extensive</b>             |
| <b>Balance</b>                    | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>extensive</b>             |
| <b>RPF interface</b>              | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>extensive</b>             |

## 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 Type Index NhRef Netif
0.0.0.0/32 perm 0 dscd 44 1
1.1.1.0/24 ifdn 0 rslv 608 1 ge-2/0/1.0
1.1.1.0/32 iddn 0 1.1.1.0 recv 606 1 ge-2/0/1.0
1.1.1.1/32 user 0 rjct 46 4
1.1.1.1/32 intf 0 1.1.1.1 locl 607 2
1.1.1.1/32 iddn 0 1.1.1.1 locl 607 2
1.1.1.255/32 iddn 0 ff:ff:ff:ff:ff:ff bcst 605 1 ge-2/0/1.0
10.0.0.0/24 intf 0 rslv 616 1 ge-2/0/0.0
10.0.0.0/32 dest 0 10.0.0.0 recv 614 1 ge-2/0/0.0
10.0.0.1/32 intf 0 10.0.0.1 locl 615 2
10.0.0.1/32 dest 0 10.0.0.1 locl 615 2
10.0.0.255/32 dest 0 10.0.0.255 bcst 613 1 ge-2/0/0.0
10.1.1.0/24 ifdn 0 rslv 612 1 ge-2/0/1.0
10.1.1.0/32 iddn 0 10.1.1.0 recv 610 1 ge-2/0/1.0
10.1.1.1/32 user 0 rjct 46 4
10.1.1.1/32 intf 0 10.1.1.1 locl 611 2
10.1.1.1/32 iddn 0 10.1.1.1 locl 611 2
10.1.1.255/32 iddn 0 ff:ff:ff:ff:ff:ff bcst 609 1 ge-2/0/1.0
10.206.0.0/16 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 rslv 418 1 fxp0.0
10.209.0.0/32 dest 0 10.209.0.0 recv 416 1 fxp0.0
10.209.2.131/32 intf 0 10.209.2.131 locl 417 2
10.209.2.131/32 dest 0 10.209.2.131 locl 417 2
10.209.17.55/32 dest 0 0:30:48:5b:78:d2 ucst 435 1 fxp0.0
10.209.63.42/32 dest 0 0:23:7d:58:92:ca ucst 434 1 fxp0.0
10.209.63.254/32 dest 0 0:12:1e:ca:98:0 ucst 419 20 fxp0.0
10.209.63.255/32 dest 0 10.209.63.255 bcst 415 1 fxp0.0
10.227.0.0/16 user 0 10.209.63.254 ucst 419 20 fxp0.0

...

Routing table: iso
ISO:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 27 1
47.0005.80ff.f800.0000.0108.0003.0102.5524.5220.00
intf 0 locl 28 1

Routing table: inet6
Internet6:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 6 1
ff00::/8 perm 0 mdsc 4 1
ff02::1/128 perm 0 ff02::1 mcst 3 1

Routing table: ccc
MPLS:
Interface.Label Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 16 1
100004(top)fe-0/0/1.0

```

```

show route forwarding-table detail
user@host> show route forwarding-table detail
Routing table: inet
Internet:
Destination Type RtRef Next hop Type Index NhRef Netif
default user 2 0:90:69:8e:b1:1b ucst 132 4 fxp0.0
default perm 0 rjct 14 1
10.1.1.0/24 intf 0 ff.3.0.21 ucst 322 1 so-5/3/0.0
10.1.1.0/32 dest 0 10.1.1.0 recv 324 1 so-5/3/0.0
10.1.1.1/32 intf 0 10.1.1.1 locl 321 1
10.1.1.255/32 dest 0 10.1.1.255 bcst 323 1 so-5/3/0.0
10.21.21.0/24 intf 0 ff.3.0.21 ucst 326 1 so-5/3/0.0
10.21.21.0/32 dest 0 10.21.21.0 recv 328 1 so-5/3/0.0
10.21.21.1/32 intf 0 10.21.21.1 locl 325 1
10.21.21.255/32 dest 0 10.21.21.255 bcst 327 1 so-5/3/0.0
127.0.0.1/32 intf 0 127.0.0.1 locl 320 1
172.17.28.19/32 clon 1 192.168.4.254 ucst 132 4 fxp0.0
172.17.28.44/32 clon 1 192.168.4.254 ucst 132 4 fxp0.0

...

Routing table: private1__inet
Internet:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 46 1
10.0.0.0/8 intf 0 rslv 136 1 fxp1.0
10.0.0.0/32 dest 0 10.0.0.0 recv 134 1 fxp1.0
10.0.0.4/32 intf 0 10.0.0.4 locl 135 2
10.0.0.4/32 dest 0 10.0.0.4 locl 135 2

...

Routing table: iso
ISO:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 38 1

Routing table: inet6
Internet6:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 22 1
ff00::/8 perm 0 mdsc 21 1
ff02::1/128 perm 0 ff02::1 mcst 17 1

...

Routing table: mpls
MPLS:
Destination Type RtRef Next hop Type Index NhRef Netif
default perm 0 rjct 28 1

show route forwarding-table destination extensive
(Weights and Balances)
user@host> show route forwarding-table destination 3.4.2.1 extensive
Routing table: inet [Index 0]
Internet:
Destination: 3.4.2.1/32
Route type: user
Route reference: 0
Flags: sent to PFE
Next-hop type: unicast
Next-hop: 4.4.4.4
Next-hop type: unicast

Route interface-index: 0
Index: 262143 Reference: 1
Index: 335 Reference: 2

```

```

Next-hop interface: so-1/1/0.0 Weight: 22 Balance: 3
Next-hop: 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
Next-hop: 0:90:69:8e:b1:1b
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
Next-hop: 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 Route interface-index: 0
Flags: sent to PFE
Next-hop type: reject Index: 46 Reference: 1

Destination: 10.0.0.0/8
Route type: interface
Route reference: 0 Route interface-index: 3
Flags: sent to PFE
Next-hop type: resolve Index: 136 Reference: 1
Next-hop interface: fxp1.0

...

Routing table: iso [Index 0]
ISO:

Destination: default
Route type: permanent
Route reference: 0 Route interface-index: 0
Flags: sent to PFE
Next-hop type: reject 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
 Index: 22 Reference: 1

Destination: ff00::/8
 Route type: permanent
 Route reference: 0
 Flags: sent to PFE
 Next-hop type: multicast discard
 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
 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
 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 15.95.1.2/30;
 }
 }
}

```

```
user@host> show route forwarding-table extensive
```

```

Routing table: inet [Index 0]
Internet:
...
...
Destination: 15.95.1.3/32
 Route type: destination
 Route reference: 0
 Flags: sent to PFE
 Nexthop: 15.95.1.3
 Next-hop type: broadcast
 Next-hop interface: so-1/1/0.0
 RPF interface: so-1/1/0.0
 Index: 328 Reference: 1

```

```

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 Type Index NhRef Netif
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 vpls
user@host> show route forwarding-table family vpls
Routing table: green.vpls
VPLS:
Destination Type RtRef Next hop Type Index NhRef Netif
default dnm 0 flood 353 1
default perm 0 rjct 298 1
fe-0/1/0.0 dnm 0 flood 355 1
00:90:69:0c:20:1f/48
 <<<<<Remote CE
 dnm 0 indr 351 4
 Push 800000, Push 100002(top)

so-0/0/0.0
00:90:69:85:b0:1f/48
 <<<<<Local CE
 dnm 0 ucst 354 2 fe-0/1/0.0

show route forwarding-table family vpls extensive
user@host> show route forwarding-table family vpls extensive
Routing table: green.vpls [Index 2]
VPLS:

Destination: default
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: unicast
Next-hop interface: fe-0/1/3.0
Next-hop type: unicast
Next-hop interface: fe-0/1/2.0
Route interface-index: 72
Index: 289 Reference: 1
Index: 291 Reference: 3
Index: 290 Reference: 3

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

Destination: fe-0/1/2.0
Route type: dynamic
Route reference: 0
Flags: sent to PFE
Next-hop type: flood
Next-hop type: indirect
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Route interface-index: 69
Index: 293 Reference: 1
Index: 363 Reference: 4

```

```

Next-hop type: indirect Index: 301 Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast Index: 291 Reference: 3
Next-hop interface: fe-0/1/3.0

Destination: fe-0/1/3.0
Route type: dynamic
Route reference: 0 Route interface-index: 70
Flags: sent to PFE
Next-hop type: flood Index: 292 Reference: 1
Next-hop type: indirect Index: 363 Reference: 4
Next-hop type: Push 800016
Next-hop interface: at-1/0/1.0
Next-hop type: indirect Index: 301 Reference: 5
Next hop: 10.31.3.2
Next-hop type: Push 800000
Next-hop interface: fe-0/1/1.0
Next-hop type: unicast Index: 290 Reference: 3
Next-hop interface: fe-0/1/2.0

Destination: 10:00:00:01:01:01/48
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: 10:00:00:01:01:04/48
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: 10:00:00:01:03:05/48
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 locl 687 2
10.0.60.14/32 dest 0 10.0.60.14 locl 687 2
10.0.60.15/32 dest 0 10.0.60.15 bcst 685 1 fe-0/1/3.0
10.0.67.12/30 user 0 10.0.60.13 ucst 713 5 fe-0/1/3.0
10.0.80.0/30 ifdn 0 ff.3.0.21 ucst 676 1 so-0/0/1.0
10.0.80.0/32 dest 0 10.0.80.0 recv 678 1 so-0/0/1.0
10.0.80.2/32 user 0 rjct 36 2
10.0.80.2/32 intf 0 10.0.80.2 locl 675 1
10.0.80.3/32 dest 0 10.0.80.3 bcst 677 1 so-0/0/1.0
10.0.90.12/30 intf 0 rslv 684 1 fe-0/1/0.0
10.0.90.12/32 dest 0 10.0.90.12 recv 682 1 fe-0/1/0.0
10.0.90.14/32 intf 0 10.0.90.14 locl 683 2
10.0.90.14/32 dest 0 10.0.90.14 locl 683 2
10.0.90.15/32 dest 0 10.0.90.15 bcst 681 1 fe-0/1/0.0
10.5.0.0/16 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.10.0.0/16 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.13.10.0/23 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.84.0.0/16 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.150.0.0/16 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.157.64.0/19 user 0 192.168.187.126 ucst 324 15 fxp0.0
10.209.0.0/16 user 0 192.168.187.126 ucst 324 15 fxp0.0

```

...

Routing table: default.iso

ISO:

| Destination | Type | RtRef | Next hop | Type | Index | NhRef | Netif |
|-------------|------|-------|----------|------|-------|-------|-------|
| default     | perm | 0     |          | rjct | 60    | 1     |       |

Routing table: default.inet6

Internet6:

| Destination | Type | RtRef | Next hop | Type | Index | NhRef | Netif |
|-------------|------|-------|----------|------|-------|-------|-------|
| default     | perm | 0     |          | rjct | 44    | 1     |       |
| ::/128      | perm | 0     |          | dscd | 42    | 1     |       |
| ff00::/8    | perm | 0     |          | mdsc | 43    | 1     |       |
| ff02::1/128 | perm | 0     | ff02::1  | mcst | 39    | 1     |       |

Routing table: default.mpls

MPLS:

| Destination | Type | RtRef | Next hop | Type | Index | NhRef | Netif |
|-------------|------|-------|----------|------|-------|-------|-------|
| default     | perm | 0     |          | dscd | 50    | 1     |       |

**show route forwarding-table table**  
~~show route forwarding-table~~  
~~show route forwarding-table~~

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     |            |
| 1.0.0.1/32   | user | 0     |                                                | dscd | 561   | 2     |            |
| 2.0.2.0/24   | intf | 0     |                                                | rslv | 771   | 1     | ge-1/2/0.3 |
| 2.0.2.0/32   | dest | 0     | 2.0.2.0                                        | recv | 769   | 1     | ge-1/2/0.3 |
| 2.0.2.1/32   | intf | 0     | 2.0.2.1                                        | locl | 770   | 2     |            |
| 2.0.2.1/32   | dest | 0     | 2.0.2.1                                        | locl | 770   | 2     |            |
| 2.0.2.2/32   | 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 |
| 2.0.2.255/32 | dest | 0     | 2.0.2.255                                      | bcst | 768   | 1     | ge-1/2/0.3 |
| 224.0.0.0/4  | perm | 1     |                                                | mdsc | 562   | 1     |            |
| 224.0.0.1/32 | perm | 0     | 224.0.0.1                                      | 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 | loc1 | 36      | 1     |       |
| 10.255.14.172/32   | user       | 0     |             | ucst | 69      | 2     |       |
| so-0/0/0.0         |            |       |             |      |         |       |       |
| 10.255.14.175/32   | user       | 0     |             | indr | 81      | 3     |       |
|                    |            |       |             | Push | 100004, | Push  |       |
| 100004(top)        | so-1/0/0.0 |       |             |      |         |       |       |
| 224.0.0.0/4        | perm       | 2     |             | mdsc | 5       | 3     |       |
| 224.0.0.1/32       | perm       | 0     | 224.0.0.1   | mcst | 1       | 8     |       |
| 224.0.0.5/32       | user       | 1     | 224.0.0.5   | mcst | 1       | 8     |       |
| 255.255.255.255/32 | perm       | 0     |             | bcst | 2       | 3     |       |

## show route hidden

|                                 |                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | <code>show route hidden</code><br><code>&lt;brief   detail   extensive   terse&gt;</code><br><code>&lt;logical-system (all   <i>logical-system-name</i>)&gt;</code>                                                                                                                                                                      |
| <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>                  | <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 hidden on page 150</a><br><a href="#">show route hidden detail on page 151</a><br><a href="#">show route hidden extensive on page 151</a><br><a href="#">show route hidden terse on page 151</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

```

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 151](#).

**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 >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

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

|                                    |                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | show route inactive-path<br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                     |
| <b>Syntax (EX Series Switches)</b> | show route inactive-path<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 routes for destinations that have no active route. An inactive route is a route that was not selected as the best path.                                                                                                                                                                                                                                                              |
| <b>Options</b>                     | <p><b>none</b>—Display all inactive routes.</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>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 inactive-path on page 153</a><br><a href="#">show route inactive-path detail on page 154</a><br><a href="#">show route inactive-path extensive on page 155</a><br><a href="#">show route inactive-path terse on page 155</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 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 user@host> show route inactive-path detail
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 154](#).

**show route inactive-path terse**

```

user@host> show route inactive-path terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
 10.12.100.12/30 0 10 1 >so-0/3/0.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
 10.0.0.0/8 D 0 0 >fxp1.0

red.inet.0: 6 destinations, 8 routes (4 active, 0 holddown, 3 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
 10.12.80.0/30 B 170 100 >10.12.80.1 100 I

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

bgp.13vpn.0: 3 destinations, 3 routes (0 active, 0 holddown, 3 hidden)
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

## show route instance

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                     | show route instance<br><brief   detail   summary><br><instance-name><br><logical-system (all   <i>logical-system-name</i> )><br><operational>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switches and QFX Series)</b> | show route instance<br><brief   detail   summary><br><instance-name><br><operational>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <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   <i>logical-system-name</i>)</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>List of Sample Output</b>                      | <a href="#">show route instance on page 157</a><br><a href="#">show route instance detail (Graceful Restart Complete) on page 158</a><br><a href="#">show route instance detail (Graceful Restart Incomplete) on page 159</a><br><a href="#">show route instance detail (VPLS Routing Instance) on page 161</a><br><a href="#">show route instance operational on page 161</a><br><a href="#">show route instance summary on page 162</a>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Output Fields</b>                              | Table 17 on page 156 lists the output fields for the <b>show route instance</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 17: 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      |

Table 17: show route instance Output Fields (*continued*)

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

```

```

12circuit.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.12vpn.0 : 2 routes (2 active, 0 holddown, 0 hidden)
 Restart Complete
LDP:
 Router ID: 10.69.105.1
 Type: vrf State: Active
 Restart State: Complete Path selection timeout: 300
 Interfaces:
 t3-0/0/0.105
 Route-distinguisher: 10.255.14.176:105
 Vrf-import: [LDP-import]
 Vrf-export: [LDP-export]
 Tables:
 LDP.inet.0 : 5 routes (4 active, 0 holddown, 0 hidden)
 Restart Complete
OSPF:
 Router ID: 10.69.101.1
 Type: vrf State: Active
 Restart State: Complete Path selection timeout: 300
 Interfaces:
 t3-0/0/0.101
 Route-distinguisher: 10.255.14.176:101
 Vrf-import: [OSPF-import]
 Vrf-export: [OSPF-export]
 Vrf-import-target: [target:11111
 Tables:
 OSPF.inet.0 : 8 routes (7 active, 0 holddown, 0 hidden)
 Restart Complete
RIP:
 Router ID: 10.69.102.1
 Type: vrf State: Active
 Restart State: Complete Path selection timeout: 300
 Interfaces:
 t3-0/0/0.102
 Route-distinguisher: 10.255.14.176:102
 Vrf-import: [RIP-import]
 Vrf-export: [RIP-export]
 Tables:
 RIP.inet.0 : 6 routes (6 active, 0 holddown, 0 hidden)
 Restart Complete
STATIC:
 Router ID: 10.69.100.1
 Type: vrf State: Active
 Restart State: Complete Path selection timeout: 300
 Interfaces:
 t3-0/0/0.100
 Route-distinguisher: 10.255.14.176:100
 Vrf-import: [STATIC-import]
 Vrf-export: [STATIC-export]
 Tables:
 STATIC.inet.0 : 4 routes (4 active, 0 holddown, 0 hidden)
 Restart Complete

```

**show route instance  
detail (Graceful  
Restart Incomplete)**

```

user@host> show route instance detail
master:
 Router ID: 10.255.14.176
 Type: forwarding State: Active
 Restart State: Pending Path selection timeout: 300
 Tables:
 inet.0 : 17 routes (15 active, 1 holddown, 1 hidden)
 Restart Pending: OSPF LDP
 inet.3 : 2 routes (2 active, 0 holddown, 0 hidden)

```

```

Restart Pending: OSPF LDP
iso.0 : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete
mpls.0 : 23 routes (23 active, 0 holddown, 0 hidden)
Restart Pending: LDP VPN
bgp.l3vpn.0 : 10 routes (10 active, 0 holddown, 0 hidden)
Restart Pending: BGP VPN
inet6.0 : 2 routes (2 active, 0 holddown, 0 hidden)
Restart Complete
bgp.l2vpn.0 : 1 routes (1 active, 0 holddown, 0 hidden)
Restart Pending: BGP VPN
BGP-INET:
 Router ID: 10.69.103.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.103
 Route-distinguisher: 10.255.14.176:103
 Vrf-import: [BGP-INET-import]
 Vrf-export: [BGP-INET-export]
 Tables:
 BGP-INET.inet.0 : 6 routes (5 active, 0 holddown, 0 hidden)
 Restart Pending: VPN
BGP-L:
 Router ID: 10.69.104.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.104
 Route-distinguisher: 10.255.14.176:104
 Vrf-import: [BGP-L-import]
 Vrf-export: [BGP-L-export]
 Tables:
 BGP-L.inet.0 : 6 routes (5 active, 0 holddown, 0 hidden)
 Restart Pending: VPN
 BGP-L.mpls.0 : 2 routes (2 active, 0 holddown, 0 hidden)
 Restart Pending: VPN
L2VPN:
 Router ID: 0.0.0.0
 Type: l2vpn State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.512
 Route-distinguisher: 10.255.14.176:512
 Vrf-import: [L2VPN-import]
 Vrf-export: [L2VPN-export]
 Tables:
 L2VPN.l2vpn.0 : 2 routes (2 active, 0 holddown, 0 hidden)
 Restart Pending: VPN L2VPN
LDP:
 Router ID: 10.69.105.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.105
 Route-distinguisher: 10.255.14.176:105
 Vrf-import: [LDP-import]
 Vrf-export: [LDP-export]
 Tables:
 LDP.inet.0 : 5 routes (4 active, 1 holddown, 0 hidden)
 Restart Pending: OSPF LDP VPN

```



```

OSPF:
 Router ID: 10.69.101.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.101
 Route-distinguisher: 10.255.14.176:101
 Vrf-import: [OSPF-import]
 Vrf-export: [OSPF-export]
 Tables:
 OSPF.inet.0 : 8 routes (7 active, 1 holddown, 0 hidden)
 Restart Pending: OSPF VPN

RIP:
 Router ID: 10.69.102.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.102
 Route-distinguisher: 10.255.14.176:102
 Vrf-import: [RIP-import]
 Vrf-export: [RIP-export]
 Tables:
 RIP.inet.0 : 8 routes (6 active, 2 holddown, 0 hidden)
 Restart Pending: RIP VPN

STATIC:
 Router ID: 10.69.100.1
 Type: vrf State: Active
 Restart State: Pending Path selection timeout: 300
 Interfaces:
 t3-0/0/0.100
 Route-distinguisher: 10.255.14.176:100
 Vrf-import: [STATIC-import]
 Vrf-export: [STATIC-export]
 Tables:
 STATIC.inet.0 : 4 routes (4 active, 0 holddown, 0 hidden)
 Restart Pending: VPN

show route instance detail (VPLS Routing Instance)
user@host> show route instance detail test-vpls
test-vpls:
 Router ID: 0.0.0.0
 Type: vpls State: Active
 Interfaces:
 lsi.1048833
 lsi.1048832
 fe-0/1/0.513
 Route-distinguisher: 10.255.37.65:1
 Vrf-import: [__vrf-import-test-vpls-internal__]
 Vrf-export: [__vrf-export-test-vpls-internal__]
 Vrf-import-target: [target:300:1]
 Vrf-export-target: [target:300:1]
 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>Syntax</b>                      | <code>show route next-hop <i>next-hop</i></code><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                           |
| <b>Syntax (EX Series Switches)</b> | <code>show route next-hop <i>next-hop</i></code><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 163</a><br><a href="#">show route next-hop detail on page 164</a><br><a href="#">show route next-hop extensive on page 165</a><br><a href="#">show route next-hop terse on page 167</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
extensive
inet.0: 18 destinations, 18 routes (17 active, 0 holddown, 1 hidden)
10.10.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.10.0.0/16 -> {192.168.71.254}

```

```

 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

10.209.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 10.209.0.0/16 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

172.16.0.0/12 (1 entry, 1 announced)
TSI:
KRT in-kernel 172.16.0.0/12 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

192.168.0.0/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 192.168.0.0/16 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

192.168.102.0/23 (1 entry, 1 announced)
TSI:
KRT in-kernel 192.168.102.0/23 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I
```

```

207.17.136.0/24 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.0/24 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

207.17.136.192/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 207.17.136.192/32 -> {192.168.71.254}
 *Static Preference: 5
 Next-hop reference count: 22
 Next hop: 192.168.71.254 via fxp0.0, selected
 State: <Active NoReadvrt Int Ext>
 Local AS: 69
 Age: 2:02:28
 Task: RT
 Announcement bits (1): 0-KRT
 AS path: I

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)
inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
green.l2vpn.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
red.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

#### show route next-hop terse

```

user@host> show route next-hop 192.168.71.254 terse

inet.0: 25 destinations, 26 routes (24 active, 0 holddown, 1 hidden)
Restart Complete
+ = Active Route, - = Last Active, * = Both

A Destination P Prf Metric 1 Metric 2 Next hop AS path
* 10.10.0.0/16 S 5 >192.168.71.254
* 10.209.0.0/16 S 5 >192.168.71.254
* 172.16.0.0/12 S 5 >192.168.71.254
* 192.168.0.0/16 S 5 >192.168.71.254
* 192.168.102.0/23 S 5 >192.168.71.254
* 207.17.136.0/24 S 5 >192.168.71.254
* 207.17.136.192/32 S 5 >192.168.71.254

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

red.inet.0: 4 destinations, 5 routes (4 active, 0 holddown, 0 hidden)
Restart Complete

```

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)  
Restart Complete

mpls.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)  
Restart Complete

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)  
Restart Complete

private1\_\_\_.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)



## show route output

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                      | show route output (address <i>ip-address</i>   interface <i>interface-name</i> )<br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Syntax (EX Series Switches)</b> | show route output (address <i>ip-address</i>   interface <i>interface-name</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>                 | <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>                                                                                                                                                                                                                      |
| <b>Options</b>                     | <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> |
| <b>Required Privilege Level</b>    | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>List of Sample Output</b>       | <a href="#">show route output address on page 170</a><br><a href="#">show route output address detail on page 170</a><br><a href="#">show route output address extensive on page 170</a><br><a href="#">show route output address terse on page 171</a><br><a href="#">show route output interface on page 171</a><br><a href="#">show route output interface detail on page 171</a><br><a href="#">show route output interface extensive on page 172</a><br><a href="#">show route output interface terse on page 172</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 output address user@host> show route output address 36.1.1.1/24
address
inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

36.1.1.0/24 *[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 36.1.1.1 detail
address detail
inet.0: 28 destinations, 30 routes (27 active, 0 holddown, 1 hidden)
36.1.1.0/24 (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 170](#).

```

show route output address terse user@host> show route output address 36.1.1.1 terse
address 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
* 36.1.1.0/24 D 0 1 >so-0/1/2.0
 0 10 1 >so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

```

show route output interface user@host> show route output interface so-0/1/2.0
interface
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
14.1.1.0/24 *[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
16.1.1.0/24 *[OSPF/10] 00:13:10, metric 2
 > via so-0/1/2.0
36.1.1.0/24 *[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 user@host> show route output interface so-0/1/2.0 detail
interface 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 171](#).

**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
* 14.1.1.0/24 0 10 3 35.1.1.2
 >so-0/1/2.0
 so-0/3/2.0
* 16.1.1.0/24 0 10 2 >so-0/1/2.0
* 36.1.1.0/24 D 0 1 >so-0/1/2.0
 0 10 1 >so-0/1/2.0

private1___.inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

inet6.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

private1___.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

```

## show route protocol

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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> <li>• <b>l2vpn</b>—Layer 2 virtual private network</li> </ul> |

- **local**—Local address
- **mpls**—Multiprotocol Label Switching
- **msdp**—Multicast Source Discovery Protocol
- **ospf**—Open Shortest Path First versions 2 and 3
- **ospf2**—Open Shortest Path First versions 2 only
- **ospf3**—Open Shortest Path First version 3 only
- **pim**—Protocol Independent Multicast
- **rip**—Routing Information Protocol
- **ripng**—Routing Information Protocol next generation
- **rsvp**—Resource Reservation Protocol
- **rtarget**—Local route target virtual private network
- **static**—Statically defined route
- **tunnel**—Dynamic tunnel
- **vpn**—Virtual private network



NOTE: EX Series switches run a subset of these protocols. See the switch CLI for details.

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required Privilege Level | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| List of Sample Output    | <a href="#">show route protocol access on page 175</a><br><a href="#">show route protocol access-internal extensive on page 175</a><br><a href="#">show route protocol arp on page 175</a><br><a href="#">show route protocol bgp on page 176</a><br><a href="#">show route protocol bgp detail on page 176</a><br><a href="#">show route protocol bgp extensive on page 176</a><br><a href="#">show route protocol bgp terse on page 177</a><br><a href="#">show route protocol direct on page 177</a><br><a href="#">show route protocol frr on page 177</a><br><a href="#">show route protocol l2circuit detail on page 178</a><br><a href="#">show route protocol l2vpn extensive on page 179</a><br><a href="#">show route protocol ldp on page 179</a><br><a href="#">show route protocol ldp extensive on page 180</a><br><a href="#">show route protocol ospf (Layer 3 VPN) on page 181</a><br><a href="#">show route protocol ospf detail on page 181</a><br><a href="#">show route protocol rip on page 182</a><br><a href="#">show route protocol rip detail on page 182</a><br><a href="#">show route protocol ripng table inet6 on page 182</a><br><a href="#">show route protocol static detail on page 182</a> |

**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 user@host> show route protocol access
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 user@host> show route protocol access-internal 13.160.0.19 extensive
access-internal inet.0: 100020 destinations, 100022 routes (100019 active, 0 holddown, 1 hidden)
extensive 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 user@host> show route protocol arp
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 user@host> show route protocol bgp 192.168.64.0/21
bgp 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 user@host> show route protocol bgp 66.117.63.0/24 detail
bgp 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 user@host> show route protocol bgp 192.168.64.0/21 extensive
bgp 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 >100.1.3.2 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

8.8.8.0/24 *[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
30.30.30.0/24 *[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

abcd::10:255:165:1/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0
fe80::2a0:a5ff:fe12:ad7/128
*[Direct/0] 25w4d 04:13:21
> via lo0.0

```

**show route protocol frr**     user@host> show route protocol frr

```

inet.0: 43 destinations, 43 routes (42 active, 0 holddown, 1 hidden)

inet.3: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

```

```

cust1.inet.0: 1033 destinations, 2043 routes (1033 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

```

```

20.20.1.3/32 *[FRR/200] 00:05:38, from 20.20.1.1
 > to 20.20.1.3 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.4/32 *[FRR/200] 00:05:38, from 20.20.1.1
 > to 20.20.1.4 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.5/32 *[FRR/200] 00:05:35, from 20.20.1.1
 > to 20.20.1.5 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.6/32 *[FRR/200] 00:05:37, from 20.20.1.1
 > to 20.20.1.6 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.7/32 *[FRR/200] 00:05:38, from 20.20.1.1
 > to 20.20.1.7 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.8/32 *[FRR/200] 00:05:38, from 20.20.1.1
 > to 20.20.1.8 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.9/32 *[FRR/200] 00:05:38, from 20.20.1.1
 > to 20.20.1.9 via ge-4/1/0.0
 to 10.10.15.1 via ge-0/2/4.0, Push 16, Push 299792(top)
20.20.1.10/32 *[FRR/200] 00:05:38, from 20.20.1.1
...

```

#### show route protocol l2circuit detail

```
user@host> show route protocol l2circuit detail
```

```

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
100000 (1 entry, 1 announced)
 *L2CKT Preference: 7
 Next hop: via ge-2/0/0.0, selected
 Label operation: Pop Offset: 4
 State: <Active Int>
 Local AS: 99
 Age: 9:52
 Task: Common L2 VC
 Announcement bits (1): 0-KRT
 AS path: I

ge-2/0/0.0 (1 entry, 1 announced)
 *L2CKT Preference: 7
 Next hop: via so-1/1/2.0 weight 1, selected
 Label-switched-path my-lsp
 Label operation: Push 100000, Push 100000(top)[0] Offset: -4
 Protocol next hop: 10.245.255.63
 Push 100000 Offset: -4
 Indirect next hop: 86af0c0 298
 State: <Active Int>
 Local AS: 99
 Age: 9:52
 Task: Common L2 VC
 Announcement bits (2): 0-KRT 1-Common L2 VC
 AS path: I

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

10.245.255.63:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
 *L2CKT Preference: 7
 Next hop: via so-1/1/2.0 weight 1, selected

```

```

Label-switched-path my-lsp
Label operation: Push 100000[0]
Protocol next hop: 10.245.255.63 Indirect next hop: 86af000 296
State: <Active Int>
Local AS: 99
Age: 10:21
Task: L2 circuit
Announcement bits (1): 0-LDP
AS path: I
VC Label 100000, MTU 1500, VLAN ID 512

```

**show route protocol  
l2vpn extensive**

```

user@host> show route protocol l2vpn extensive

inet.0: 14 destinations, 15 routes (13 active, 0 holddown, 1 hidden)

inet.3: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

mpls.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
800001 (1 entry, 1 announced)
TSI:
KRT in-kernel 800001 /36 -> {so-0/0/0.0}
 *L2VPN Preference: 7
 Next hop: via so-0/0/0.0 weight 49087 balance 97%, selected
 Label operation: Pop Offset: 4
 State: <Active Int>
 Local AS: 69
 Age: 7:48
 Task: Common L2 VC
 Announcement bits (1): 0-KRT
 AS path: I

so-0/0/0.0 (1 entry, 1 announced)
TSI:
KRT in-kernel so-0/0/0.0 /16 -> {indirect(288)}
 *L2VPN Preference: 7
 Next hop: via so-0/0/1.0, selected
 Label operation: Push 800000 Offset: -4
 Protocol next hop: 10.255.14.220
 Push 800000 Offset: -4
 Indirect next hop: 85142a0 288
 State: <Active Int>
 Local AS: 69
 Age: 7:48
 Task: Common L2 VC
 Announcement bits (2): 0-KRT 1-Common L2 VC
 AS path: I
 Communities: target:69:1 Layer2-info: encaps:PPP,
 control flags:2, mtu: 0

```

**show route protocol  
ldp**

```

user@host> show route protocol ldp

inet.0: 12 destinations, 13 routes (12 active, 0 holddown, 0 hidden)

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

192.168.16.1/32 *[LDP/9] 1d 23:03:35, metric 1
 > via t1-4/0/0.0, Push 100000
192.168.17.1/32 *[LDP/9] 1d 23:03:35, metric 1
 > via t1-4/0/0.0

```

```

private1___.inet.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

mpls.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

100064 *[LDP/9] 1d 23:03:35, metric 1
 > via t1-4/0/0.0, Pop
100064(S=0) *[LDP/9] 1d 23:03:35, metric 1
 > via t1-4/0/0.0, Pop
100080 *[LDP/9] 1d 23:03:35, metric 1
 > via t1-4/0/0.0, Swap 100000

```

**show route protocol  
ldp extensive**

```

user@host> show route protocol ldp extensive
192.168.16.1/32 (1 entry, 1 announced)
 State: <FlashAll>
 *LDP Preference: 9
 Next-hop reference count: 3
 Next hop: via t1-4/0/0.0, selected
 Label operation: Push 100000
 State: <Active Int>
 Local AS: 65500
 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: 65500
 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: 65500
 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-kerne1 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: 65500
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-kerne1 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: 65500
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
224.0.0.5/32 *[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
224.0.0.5/32 *[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
Nextthop: 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
224.0.0.9/32 * [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>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>                     | <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>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.                                                                                                                                                                                                                               |  |
| <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 187</a><br><a href="#">show route receive-protocol bgp extensive on page 187</a><br><a href="#">show route receive-protocol bgp table extensive on page 187</a><br><a href="#">show route receive-protocol bgp logical-system extensive on page 187</a><br><a href="#">show route receive-protocol bgp detail (Layer 2 VPN) on page 188</a><br><a href="#">show route receive-protocol bgp extensive (Layer 2 VPN) on page 189</a><br><a href="#">show route receive-protocol bgp (Layer 3 VPN) on page 189</a><br><a href="#">show route receive-protocol bgp detail (Layer 3 VPN) on page 190</a><br><a href="#">show route receive-protocol bgp extensive (Layer 3 VPN) on page 191</a> |  |
| <b>Output Fields</b>               | <a href="#">Table 18 on page 184</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 18: 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      |



Table 18: show route receive-protocol Output Fields (*continued*)

| Field Name                                   | Field Description                                                                                                                                                                                                                                                                                                                        | Level of Output         |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>number routes</b>                         | 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              |
| <b>Prefix</b>                                | Destination prefix.                                                                                                                                                                                                                                                                                                                      | none <b>brief</b>       |
| <b>MED</b>                                   | Multiple exit discriminator value included in the route.                                                                                                                                                                                                                                                                                 | none <b>brief</b>       |
| <b>destination-prefix (entry, announced)</b> | 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>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> |
| <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              |

Table 18: show route receive-protocol Output Fields (*continued*)

| Field Name                 | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Level of Output         |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <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>• <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 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>• <b>[ ]</b>—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>• <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>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 in 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 AS that originated the route. These values are stored in the <b>Attrset</b> attribute at the originating routing device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <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 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
1.1.1.0/24 (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
165.3.0.0/16 (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
165.4.0.0/16 (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
195.1.2.0/24 (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

* 44.0.0.0/24 (1 entry, 1 announced)
 Accepted
 Route Label: 300096
 Nexthop: 10.0.0.9
 AS path: 13979 I
 AIGP: 203

* 55.0.0.0/24 (1 entry, 1 announced)
 Accepted
 Route Label: 300112
 Nexthop: 10.0.0.9
 AS path: 13979 7018 I
 AIGP: 25

* 66.0.0.0/24 (1 entry, 1 announced)
 Accepted
 Route Label: 300144
 Nexthop: 10.0.0.9
 AS path: 13979 7018 I

* 99.0.0.0/24 (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 10.255.245.63 extensive
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
 1.1.1.0/24 (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
 165.3.0.0/16 (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
 165.4.0.0/16 (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
 195.1.2.0/24 (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>Syntax</b>                      | <code>show route table <i>routing-table-name</i></code><br><brief   detail   extensive   terse><br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax (EX Series Switches)</b> | <code>show route table <i>routing-table-name</i></code><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 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 name begins 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 193</a><br><a href="#">show route table bgp.l3vpn.0 on page 193</a><br><a href="#">show route table bgp.l3vpn.0 detail on page 193</a><br><a href="#">show route table bgp.rtarget.0 (When Proxy BGP Route Target Filtering Is Configured) on page 195</a><br><a href="#">show route table inet.0 on page 195</a><br><a href="#">show route table inet6.0 on page 195</a><br><a href="#">show route table inet6.3 on page 195</a><br><a href="#">show route table inetflow detail on page 196</a><br><a href="#">show route table l2circuit.0 on page 196</a><br><a href="#">show route table mpls on page 196</a><br><a href="#">show route table mpls extensive on page 197</a><br><a href="#">show route table mpls.0 on page 197</a><br><a href="#">show route table mpls.0 (RSVP Route—Transit LSP) on page 197</a><br><a href="#">show route table vpls_1 detail on page 198</a><br><a href="#">show route table vpn-a on page 198</a><br><a href="#">show route table vpn-a.mdt.0 on page 198</a><br><a href="#">show route table VPN-A detail on page 199</a><br><a href="#">show route table VPN-AB.inet.0 on page 199</a><br><a href="#">show route table VPN_blue.mvpn-inet6.0 on page 199</a><br><a href="#">show route table VPN-A detail on page 200</a> |



[show route table inetflow detail on page 200](#)

**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 table user@host> show route table bgp.l2vpn
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 user@host> show route table bgp.l3vpn.0
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 user@host> show route table bgp.l3vpn.0 detail
bgp.l3vpn.0 detail bgp.l3vpn.0: 8 destinations, 8 routes (8 active, 0 holddown, 0 hidden)

10.255.245.12:1:4.0.0.0/8 (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 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 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 111.222.5.254 via fxp0.0
1.0.0.1/32 * [Direct/0] 00:51:58
 > via at-5/3/0.0
1.0.0.2/32 * [Local/0] 00:51:58
 Local
12.12.12.21/32 * [Local/0] 00:51:57
 Reject
13.13.13.13/32 * [Direct/0] 00:51:58
 > via t3-5/2/1.0
13.13.13.14/32 * [Local/0] 00:51:58
 Local
13.13.13.21/32 * [Local/0] 00:51:58
 Local
13.13.13.22/32 * [Direct/0] 00:33:59
 > via t3-5/2/0.0
127.0.0.1/32 [Direct/0] 00:51:58
 > via lo0.0
111.222.5.0/24 * [Direct/0] 00:51:58
 > via fxp0.0
111.222.5.81/32 * [Local/0] 00:51:58
 Local

```

```

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: 65002 Peer AS: 65000
 Age: 4
 Task: BGP_65000.10.12.99.5+3792
 Announcement bits (1): 0-Flow
 AS path: 65000 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: 65002
 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: 11 destinations, 11 routes (11 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

0 *[MPLS/0] 00:45:09, metric 1
 Receive
1 *[MPLS/0] 00:45:09, metric 1
 Receive
2 *[MPLS/0] 00:45:09, metric 1
 Receive
100000 *[L2VPN/7] 00:43:04
 > via so-0/1/0.1, Pop
100001 *[L2VPN/7] 00:43:03
 > via so-0/1/0.2, Pop Offset: 4
100002 *[LDP/9] 00:43:22, metric 1
 via so-0/1/2.0, Pop
 > via so-0/1/3.0, Pop
100002(S=0) *[LDP/9] 00:43:22, metric 1
 via so-0/1/2.0, Pop
 > via so-0/1/3.0, Pop
100003 *[LDP/9] 00:43:22, metric 1
 > via so-0/1/2.0, Swap 100002
 via so-0/1/3.0, Swap 100002
100004 *[LDP/9] 00:43:16, metric 1
 via so-0/1/2.0, Swap 100049
 > via so-0/1/3.0, Swap 100049
so-0/1/0.1 *[L2VPN/7] 00:43:04
 > via so-0/1/2.0, Push 100001, Push 100049(top)
 via so-0/1/3.0, Push 100001, Push 100049(top)
so-0/1/0.2 *[L2VPN/7] 00:43:03
 via so-0/1/2.0, Push 100000, Push 100049(top) Offset: -4
 > via so-0/1/3.0, Push 100000, Push 100049(top) Offset: -4

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

```

```

13 Receive
 *[MPLS/0] 00:37:31, metric 1
 Receive
300352 *[RSVP/7/1] 00:08:00, metric 1
 > to 8.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
300352(S=0) *[RSVP/7/1] 00:08:00, metric 1
 > to 8.64.0.106 via ge-1/0/1.0, label-switched-path lsp1_p2p
300384 *[RSVP/7/2] 00:05:20, metric 1
 > to 8.64.1.106 via ge-1/0/0.0, Pop
300384(S=0) *[RSVP/7/2] 00:05:20, metric 1
 > to 8.64.1.106 via ge-1/0/0.0, Pop

show route table vpls_1 user@host> show route table vpls_1 detail
detail vpls_1.l2vpn.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
Restart Complete

1.1.1.11:1000:1:1/96 (1 entry, 1 announced)
*L2VPN Preference: 170/-1
Receive table: vpls_1.l2vpn.0
Next-hop reference count: 2
State: <Active Int Ext>
Age: 4:29:47 Metric2: 1
Task: vpls_1-l2vpn
Announcement bits (1): 1-BGP.0.0.0+179
AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down
Label-base: 800000, range: 8, status-vector: 0xFF

show route table vpn-a user@host> show route table vpn-a
vpn-a.l2vpn.0: 3 destinations, 3 routes (3 active, 0 holddown, 0 hidden)

+ = Active Route, - = Last Active, * = Both
192.168.16.1:1:1:1/96
 *[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 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.l3vpn.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

```

```

1:10.255.2.202:65535:10.255.2.202/432
 *[BGP/170] 00:02:37, localpref 100, from 10.255.2.202
 AS path: I
 > via so-0/1/3.0
1:10.255.2.203:65535:10.255.2.203/432
 *[BGP/170] 00:02:37, localpref 100, from 10.255.2.203
 AS path: I
 > via so-0/1/0.0
1:10.255.2.204:65535:10.255.2.204/432
 *[MVPN/70] 00:57:23, metric2 1
 Indirect
5:10.255.2.202:65535:128::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
6:10.255.2.203:65535:65000:128::10.12.53.12:128:ffff::1/432
 *[PIM/105] 00:02:37
 Multicast (IPv6)
7:10.255.2.202:65535:65000:128::192.168.90.2:128:ffff::1/432
 *[MVPN/70] 00:02:37, metric2 1
 Indirect

```

**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  
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: 65002 Peer AS: 65000
 Age: 4
 Task: BGP_65000.10.12.99.5+3792
 Announcement bits (1): 0-Flow
 AS path: 65000 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: 65002
 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@PE1> 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

1.1.1.2:100:1.1.1.2/96 AD
 *[VPLS/170] 1d 03:11:03, metric2 1
 Indirect
1.1.1.4:100:1.1.1.4/96 AD
 *[BGP/170] 1d 03:11:02, localpref 100, from 1.1.1.4
 AS path: I, validation-state: unverified
 > via ge-1/2/1.5
1.1.1.2:100:1:0/96 MH
 *[VPLS/170] 1d 03:11:03, metric2 1
 Indirect
1.1.1.4:100:1:0/96 MH
 *[BGP/170] 1d 03:11:02, localpref 100, from 1.1.1.4
 AS path: I, validation-state: unverified
 > via ge-1/2/1.5
1.1.1.4:NoCtrlWord:5:100:100:1.1.1.2:1.1.1.4/176
 *[VPLS/7] 1d 03:11:02, metric2 1
 > via ge-1/2/1.5
1.1.1.4:NoCtrlWord:5:100:100:1.1.1.4:1.1.1.2/176
 *[LDP/9] 1d 03:11:02
 Discard

```

## show route terse


|                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | show route terse<br><logical-system (all   <i>logical-system-name</i> )>                                                                                                                                                                        |
| <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 <b>show route terse</b> 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 204</a>                                                                                                                                                                                                    |
| <b>Output Fields</b>                                                                                                                                                                                                                                                                                                                                                                                                              | <a href="#">Table 19 on page 202</a> describes the output fields for the <b>show route terse</b> command. Output fields are listed in the approximate order in which they appear.                                                               |

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

| Field Name         | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>route key</b>   | <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> |
| <b>Destination</b> | 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>                                                                                              |
| <b>Metric 1</b>    | First metric value in the route. For routes learned from BGP, this is the MED metric.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Metric 2</b>    | Second metric value in the route. For routes learned from BGP, this is the IGP metric.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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

| Field Name      | Field Description                                                                                                                                                                                                                                                                                                                                          |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Next hop</b> | Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.                                                                                                                                                                                                                                                          |
| <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>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
* ? 1.0.1.1/32 O 10 1 >10.0.0.2 I
? B 170 100 >10.0.0.2 I
 unverified >10.0.0.2
* ? 1.1.1.1/32 D 0 >10.0.2
* V 2.2.0.2/32 B 170 110 >10.0.0.2 200 I
 valid >10.0.0.2
* ? 10.0.0.0/30 D 0 >1t-1/2/0.1
? B 170 100 >10.0.0.2 I
 unverified >10.0.0.2
* ? 10.0.0.1/32 L 0 Local
* ? 10.0.0.4/30 B 170 100 >10.0.0.2 I
 unverified >10.0.0.2
* ? 10.0.0.8/30 B 170 100 >10.0.0.2 I
 unverified >10.0.0.2
* I 172.16.1.1/32 B 170 90 >10.0.0.2 200 I
 invalid >10.0.0.2
* N 192.168.2.3/32 B 170 100 >10.0.0.2 200 I
 unknown >10.0.0.2
* ? 224.0.0.5/32 O 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <i>policy-name</i> —Name of a policy.<br><i>prefix</i> —Destination prefix to match.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Additional Information</b>   | 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. |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>show policy damping</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>List of Sample Output</b>    | <a href="#">test policy on page 205</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 3.0.0.1/8
inet.0: 44 destinations, 44 routes (44 active, 0 holddown, 0 hidden)
Prefixes passing policy:

3.0.0.0/8 *[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
3.3.3.1/32 *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
 > to 10.0.4.7 via fxp0.0
3.3.3.2/32 *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
 > to 10.0.4.7 via fxp0.0
3.3.3.3/32 *[IS-IS/18] 2d 00:21:46, metric 0, tag 2
 > to 10.0.4.7 via fxp0.0
3.3.3.4/32 *[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
```

## PART 4

# Troubleshooting

- [Routing Protocol Process Memory FAQs on page 209](#)





## CHAPTER 6

# Routing Protocol Process Memory FAQs

- [Routing Protocol Process Memory FAQs Overview on page 209](#)
- [Routing Protocol Process Memory FAQs on page 210](#)

### Routing Protocol Process Memory FAQs 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**

- [Routing Protocol Process Memory FAQs on page 210](#)

---

## Routing Protocol Process Memory FAQs

The following sections present the most frequently asked questions and answers related to the routing protocol process memory utilization, operation, interpretation of related command outputs, and troubleshooting the software process.

### Frequently Asked Questions: Routing Protocol Process Memory

This section presents frequently asked questions and answers related to the memory usage of the routing protocol process.

#### Why does the routing protocol process use excessive memory?

The routing protocol process uses hundreds of megabytes of RAM in the Routing Engine to store information needed for the operation of routing and related protocols, such as BGP, OSPF, IS-IS, RSVP, LDP and MPLS. Such huge consumption of memory is common for the process, as the information it stores includes routes, next hops, interfaces, routing policies, labels, and label-switched paths (LSPs). Because access to the RAM memory is much faster than access to the hard disk, most of the routing protocol process information is stored in the RAM memory instead of using the hard disk space. This ensures that the performance of the routing protocol process is maximized.

#### How can I check the amount of memory the routing protocol process is using?

You can check routing protocol process memory usage by entering the **show system processes** and the **show task memory** Junos OS command-line interface (CLI) operational mode commands.

The **show system processes** command displays information about software processes that are running on the device and that have controlling terminals. The **show task memory** command displays memory utilization for routing protocol tasks on the Routing Engine.

You can check the routing protocol process memory usage by using the **show system processes** command with the **extensive** option. The **show task memory** command displays a report generated by the routing protocol process on its own memory usage. However, this report does not display all the memory used by the process. The value reported by the routing protocol process does not account for the memory used for the **TEXT** and **STACK** segments, or the memory used by the process's internal memory manager. Further, the Resident Set Size value includes shared library pages used by the routing protocol process.

For more information about checking the routing protocol process memory usage, see [Check Routing Protocol Process \(rpd\) Memory Usage](#).

For more information, see the **show system processes** command and the **show task memory** command.

**I just deleted a large number of routes from the routing protocol process. Why is it still using so much memory?**

The **show system processes extensive** command displays a **RES** value measured in kilobytes. This value represents the amount of program memory resident in the physical memory. This is also known as RSS or Resident Set Size. The **RES** value includes shared library pages used by the process. Any amount of memory freed by the process might still be considered part of the **RES** value. Generally, the kernel delays the migrating of memory out of the **Inact** queue into the **Cache** or **Free** list unless there is a memory shortage. This can lead to large discrepancies between the values reported by the routing protocol process and the kernel, even after the routing protocol process has freed a large amount of memory.

## Frequently Asked Questions: Interpreting Routing Protocol Process-Related Command Outputs

This section presents frequently asked questions and answers about the routing protocol process-related Junos OS command-line interface (CLI) command outputs that are used to display the memory usage of the routing protocol process.

**How do I interpret memory numbers displayed in the show system processes extensive command output?**

The **show system processes extensive** command displays exhaustive system process information about software processes that are running on the device and have controlling terminals. This command is equivalent to the UNIX **top** command. However, the UNIX **top** command shows real-time memory usage, with the memory values constantly changing, while the **show system processes extensive** command provides a snapshot of memory usage in a given moment.

To check overall CPU and memory usage, enter the **show system processes extensive** command. Refer to [Table 20 on page 212](#) for information about the **show system processes extensive** commands output fields.

```
user@host> show system processes extensive
```

```
last pid: 544; load averages: 0.00, 0.00, 0.00 18:30:33
37 processes: 1 running, 36 sleeping
```

```
Mem: 25M Active, 3968K Inact, 19M Wired, 184K Cache, 8346K Buf, 202M Free
```

```
Swap: 528M Total, 64K Used, 528M Free
```

| PID | USERNAME | PRI | NICE | SIZE  | RES    | STATE  | TIME | WCPU  | CPU   | COMMAND      |
|-----|----------|-----|------|-------|--------|--------|------|-------|-------|--------------|
| 544 | root     | 30  | 0    | 604K  | 768K   | RUN    | 0:00 | 0.00% | 0.00% | top          |
| 3   | root     | 28  | 0    | 0K    | 12K    | psleep | 0:00 | 0.00% | 0.00% | vmdaemon     |
| 4   | root     | 28  | 0    | 0K    | 12K    | update | 0:03 | 0.00% | 0.00% | update       |
| 528 | aviva    | 18  | 0    | 660K  | 948K   | pause  | 0:00 | 0.00% | 0.00% | tcsh         |
| 204 | root     | 18  | 0    | 300K  | 544K   | pause  | 0:00 | 0.00% | 0.00% | csh          |
| 131 | root     | 18  | 0    | 332K  | 532K   | pause  | 0:00 | 0.00% | 0.00% | cron         |
| 186 | root     | 18  | 0    | 196K  | 68K    | pause  | 0:00 | 0.00% | 0.00% | watchdog     |
| 27  | root     | 10  | 0    | 512M  | 16288K | mfsidl | 0:00 | 0.00% | 0.00% | mount_mfs    |
| 1   | root     | 10  | 0    | 620K  | 344K   | wait   | 0:00 | 0.00% | 0.00% | init         |
| 304 | root     | 3   | 0    | 884K  | 900K   | ttyin  | 0:00 | 0.00% | 0.00% | bash         |
| 200 | root     | 3   | 0    | 180K  | 540K   | ttyin  | 0:00 | 0.00% | 0.00% | getty        |
| 203 | root     | 3   | 0    | 180K  | 540K   | ttyin  | 0:00 | 0.00% | 0.00% | getty        |
| 202 | root     | 3   | 0    | 180K  | 540K   | ttyin  | 0:00 | 0.00% | 0.00% | getty        |
| 201 | root     | 3   | 0    | 180K  | 540K   | ttyin  | 0:00 | 0.00% | 0.00% | getty        |
| 194 | root     | 2   | 0    | 2248K | 1640K  | select | 0:11 | 0.00% | 0.00% | rpd          |
| 205 | root     | 2   | 0    | 964K  | 800K   | select | 0:12 | 0.00% | 0.00% | tnp.chassisd |

```

189 root 2 -12 352K 740K select 0:03 0.00% 0.00% xntpd
114 root 2 0 296K 612K select 0:00 0.00% 0.00% amd
188 root 2 0 780K 600K select 0:00 0.00% 0.00% dcd
527 root 2 0 176K 580K select 0:00 0.00% 0.00% rlogind
195 root 2 0 212K 552K select 0:00 0.00% 0.00% inetd
187 root 2 0 192K 532K select 0:00 0.00% 0.00% tnetd
 83 root 2 0 188K 520K select 0:00 0.00% 0.00% syslogd
538 root 2 0 1324K 516K select 0:00 0.00% 0.00% mgd
 99 daemon 2 0 176K 492K select 0:00 0.00% 0.00% portmap
163 root 2 0 572K 420K select 0:00 0.00% 0.00% nsrexecd
192 root 2 0 560K 400K select 0:10 0.00% 0.00% snmpd
191 root 2 0 1284K 376K select 0:00 0.00% 0.00% mgd
537 aviva 2 0 636K 364K select 0:00 0.00% 0.00% cli
193 root 2 0 312K 204K select 0:07 0.00% 0.00% mib2d
 5 root 2 0 0K 12K pfesel 0:00 0.00% 0.00% if_pfe
 2 root -18 0 0K 12K psleep 0:00 0.00% 0.00% pagedaemon
 0 root -18 0 0K 0K sched 0:00 0.00% 0.00% swapper

```

Table 20 on page 212 describes the output fields that represent the memory values for the **show system processes extensive** command. Output fields are listed in the approximate order in which they appear.

Table 20: show system processes extensive Output Fields

| Field Name    | Field Description                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mem</b>    | Information about physical and virtual memory allocation.                                                                                                                                                                         |
| <b>Active</b> | Memory allocated and actively used by the program.                                                                                                                                                                                |
| <b>Inact</b>  | Memory allocated but not recently used or memory freed by the programs. Inactive memory remains mapped in the address space of one or more processes and, therefore, counts toward the RSS value of those processes.              |
| <b>Wired</b>  | Memory that is not eligible to be swapped, usually used for in-kernel memory structures and/or memory physically locked by a process.                                                                                             |
| <b>Cache</b>  | Memory that is not associated with any program and does not need to be swapped before being reused.                                                                                                                               |
| <b>Buf</b>    | Size of memory buffer used to hold data recently called from the disk.                                                                                                                                                            |
| <b>Free</b>   | Memory that is not associated with any programs. Memory freed by a process can become <b>Inactive</b> , <b>Cache</b> , or <b>Free</b> , depending on the method used by the process to free the memory.                           |
| <b>Swap</b>   | Information about swap memory. <ul style="list-style-type: none"> <li>• Total—Total memory available to be swapped to disk.</li> <li>• Used—Memory swapped to disk.</li> <li>• Free—Memory available for further swap.</li> </ul> |

The rest of the command output displays information about the memory usage of each process. The **SIZE** field indicates the size of the virtual address space, and the **RES** field indicates the amount of the program in physical memory, which is also known as RSS or Resident Set Size. For more information, see the **show system processes** command.

### What is the difference between Active and Inact memory that is displayed by the show system processes extensive command?

When the system is under memory pressure, the pageout process reuses memory from the free, cache, inactive and, if necessary, active pages. When the pageout process runs, it scans memory to see which pages are good candidates to be unmapped and freed up. Thus, the distinction between **Active** and **Inact** memory is only used by the pageout process to determine which pool of pages to free first at the time of a memory shortage.

The pageout process first scans the **Inact** list, and checks whether the pages on this list have been accessed since the time they have been listed here. The pages that have been accessed are moved from the **Inact** list to the **Active** list. On the other hand, pages that have not been accessed become prime candidates to be freed by the pageout process. If the pageout process cannot produce enough free pages from the **Inact** list, pages from the **Active** list get freed up.

Because the pageout process runs only when the system is under memory pressure, the pages on the **Inact** list remain untouched – even if they have not been accessed recently – when the amount of **Free** memory is adequate.

### How do I interpret memory numbers displayed in the show task memory command output?

The **show task memory** command provides a comprehensive picture of the memory utilization for routing protocol tasks on the Routing Engine. The routing protocol process is the main task that uses Routing Engine memory.

To check routing process memory usage, enter the **show task memory** command. Refer to [Table 21 on page 213](#) for information about the **show task memory** command output fields.

```
user@host> show task memory
Memory Size (kB) %Available When
Currently In Use: 29417 3% now
Maximum Ever Used: 33882 4% 00/02/11 22:07:03
Available: 756281 100% now
```

[Table 21 on page 213](#) describes the output fields for the **show task memory** command. Output fields are listed in the approximate order in which they appear.

**Table 21: show task memory Output Fields**

| Field Name               | Field Description                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------|
| Memory Currently In Use  | Memory currently in use. Dynamically allocated memory plus the <b>DATA</b> segment memory in kilobytes. |
| Memory Maximum Ever Used | Maximum memory ever used.                                                                               |
| Memory Available         | Memory currently available.                                                                             |

The **show task memory** command does not display all the memory used by the routing protocol process. This value does not account for the memory used for the **TEXT** and

**STACK** segments, or the memory used by the routing protocol process's internal memory manager.

#### Why is the Currently In Use value less than the RES value?

The **show task memory** command displays a **Currently In Use** value measured in kilobytes. This value represents the memory currently in use. It is the dynamically allocated memory plus the **DATA** segment memory. The **show system processes extensive** command displays a **RES** value measured in kilobytes. This value represents the amount of program memory resident in the physical memory. This is also known as RSS or Resident Set Size.

The **Currently In Use** value does not account for all of the memory that the routing protocol process uses. This value does not include the memory used for the **TEXT** and the **STACK** segments, and a small percentage of memory used by the routing protocol process's internal memory manager. Further, the **RES** value includes shared library pages used by the routing protocol process.

Any amount of memory freed by the routing protocol process might still be considered part of the **RES** value. Generally, the kernel delays the migrating of memory out of the **Inact** queue into the **Cache** or **Free** list unless there is a memory shortage. This can lead to large discrepancies between the **Currently In Use** value and the **RES** value.

## Frequently Asked Questions: Routing Protocol Process Memory Swapping

This section presents frequently asked questions and answers related to the memory swapping of the routing protocol process from the Routing Engine memory to the hard disk memory.

#### How do I monitor swap activity?

When the system is under memory pressure, the pageout process reuses memory from the free, cache, inact and, if necessary, active pages. You can monitor the swap activity by viewing the syslog message reported by the kernel during periods of high pageout activity.

The syslog message appears as follows:

```
Mar 3 20:08:02 olympic /kernel: High pageout rate!! 277 pages/sec.
```

You can use the **vmstat -s** command to print the statistics for the swapout activity. The displayed statistics appear as follows:

```
0 swap pager pageouts
0 swap pager pages paged out
```

The **swap pager pageouts** is the number of pageout operations to the swap device, and the **swap pager pages paged out** is the number of pages paged out to the swap device.

#### Why does the system start swapping when I try to dump core using the request system core-dumps command?

The **request system core-dumps** command displays a list of system core files created when the device has failed. This command can be useful for diagnostic purposes. Each list item includes the file permissions, number of links, owner, group, size, modification

date, path, and filename. You can use the **core-filename** option and the **core-file-info**, **brief**, and **detail** options to display more information about the specified core-dump files.

You can use the **request system core-dumps** command to perform a non-fatal core-dump without aborting the routing protocol process. To do this, the routing protocol process is forked, generating a second copy, and then aborted. This process can double the memory consumed by the two copies of the routing protocol processes, pushing the system into swap.

#### **Why does the show system processes extensive command show that memory is swapped to disk although there is plenty of free memory?**

Memory can remain swapped out indefinitely if it is not accessed again. Therefore, the **show system processes extensive** command shows that memory is swapped to disk even though there is plenty of free memory, and such a situation is not unusual.

### **Frequently Asked Questions: Troubleshooting the Routing Protocol Process**

This section presents frequently asked questions and answers related to a shortage of memory and memory leakage by the routing protocol process.

#### **What does the RPD\_OS\_MEMHIGH message mean?**

The **RPD\_OS\_MEMHIGH** message is written into the system message file if the routing protocol process is running out of memory. This message alerts you that the routing protocol process is using the indicated amount and percentage of Routing Engine memory, which is considered excessive. This message is generated either because the routing protocol process is leaking memory or the use of system resources is excessive, perhaps because routing filters are misconfigured or the configured network topology is very complex.

When the memory utilization for the routing protocol process is using all available Routing Engine DRAM memory (Routing Engines with maximum 2 GB DRAM) or reaches the limit of 2 GB of memory (Routing Engines with 4 GB DRAM), a message of the following form is written every minute in the syslog message file:

**RPD\_OS\_MEMHIGH: Using 188830 KB of memory, 100 percent of available**

This message includes the amount, in kilobytes and/or the percentage, of the available memory in use.

This message should not appear under normal conditions, as any further memory allocations usually require a portion of existing memory to be written to swap. As a recommended solution, increase the amount of RAM in the Routing Engine. For more information, go to <http://kb.juniper.net/InfoCenter/index?page=content&id=KB14186>.

#### **What can I do when there is a memory shortage even after a swap?**

It is not recommended for the system to operate in this state, notwithstanding the existence of swap. The protocols that run in the routing protocol process usually have a real-time requirement that cannot reliably withstand the latency of being swapped to hard disk. If the memory shortage has not resulted from a memory leak, then either a

reduction in the memory usage or an upgrade to a higher memory-capacity Routing Engine is required.

#### How do I determine whether there is a memory leak in the routing protocol process?

Memory leaks are typically the result of a seemingly unbounded growth in the memory usage of a process as reported by the **show system processes extensive** command.

There are two classes of memory leaks that the routing protocol process can experience.

- The first class occurs when the allocated memory that is no longer in use is not freed. This class of leak can usually be fixed by taking several samples of the **show task memory detail** command over a period of time and comparing the deltas.
- The second class occurs when there is a late access to freed memory. If the access is not outside the mapped address space, the kernel backfills the accessed page with real memory. This backfill is done without the knowledge of the routing protocol process's internal memory allocator, which makes this class of leak much more difficult to resolve. If a memory leak of this class is suspected, writing the state of the system to a disk file (creating a core file) is suggested.

A large discrepancy between the **RES** value and the **Currently In Use** value might indicate a memory leak. However, large discrepancies can also occur for legitimate reasons. For example, the memory used for the **TEXT** and **STACK** segments or the memory used by the routing protocol process's internal memory manager might not be displayed. Further, the **RES** value includes shared library pages used by the process.

#### What is the task\_timer?

The source of a routing protocol process memory leak can usually be identified by dumping the timers for each task. You can use the **show task task-name** command to display routing protocol tasks on the Routing Engine. Tasks can be baseline tasks performed regardless of the device's configuration, and other tasks that depend on the device configuration.

For more information, see the **show task** command.

#### Related Documentation

- [Routing Protocol Process Memory FAQs Overview on page 209](#)



## PART 5

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