JUNIPER NETWORKS

Junos® OS for EX Series Ethernet Switches

Multicast on EX4300 Switches

Release
14.1X53

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Junos® OS for EX Series Ethernet Switches Multicast on EX4300 Switches
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Supported Platforms

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

- EX 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.xsl;
       }
     }
   }
   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.xsl; }
   ```

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.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xiii 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**

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

Convention	Description	Examples
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	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** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric** ***metric*****>;**
| (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** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [** ***community-ids*** **]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.

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

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

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

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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

CHAPTER 1

IGMP Snooping Overview

IGMP Snooping on EX Series Switches Overview

Internet Group Management Protocol (IGMP) snooping constrains the flooding of IPv4 multicast traffic on VLANs on a switch. When IGMP snooping is enabled on a VLAN, a Juniper Networks EX Series Ethernet Switch examines IGMP messages between hosts and multicast routers and learns which hosts are interested in receiving traffic for a multicast group. Based on what it learns, the switch then forwards multicast traffic only to those interfaces in the VLAN that are connected to interested receivers instead of flooding the traffic to all interfaces.

IGMP snooping on EX Series switches supports IGMP version 1 (IGMPv1), IGMPv2, and IGMPv3. For details on IGMP, see the following standards:

- IGMPv1—See RFC 1112, *Host extensions for IP multicasting*.
- IGMPv2—See RFC 2236, *Internet Group Management Protocol, Version 2*.
- For IGMPv3—See RFC 3376, *Internet Group Management Protocol, Version 3*.

This topic covers:

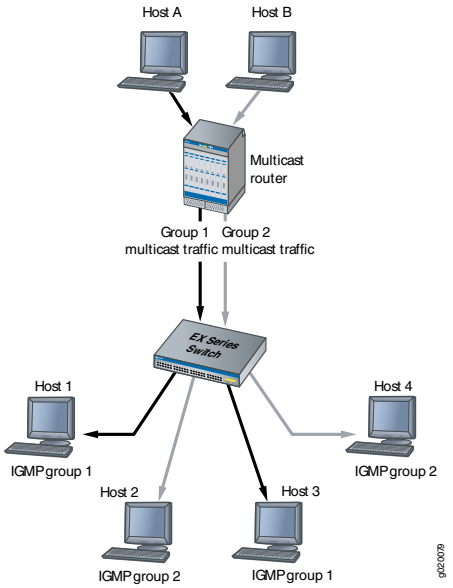
How IGMP Snooping Works

A Layer 2 switch usually learns *unicast* media access control (MAC) addresses by checking the source address field of the frames it receives. However, a *multicast* MAC address can never be the source address for a packet. As a result, the switch floods multicast traffic on the VLAN, consuming significant amounts of bandwidth.

You can enable IGMP snooping on a switch to avoid this flooding. When IGMP snooping is enabled, the switch monitors IGMP messages between receivers and multicast routers and uses the content of the messages to build an IPv4 multicast forwarding table—a database of multicast groups and the interfaces that are connected to members of the groups. When the switch receives multicast traffic for a multicast group, it uses the forwarding table to forward the traffic only to interfaces that are connected to receivers that belong to the multicast group.

Figure 1 on page 4 shows an example of multicast traffic flow with IGMP snooping enabled.

Figure 1: Multicast Traffic Flow with IGMP Snooping Enabled



IGMP Message Types

Multicast routers use IGMP to learn, for each of their attached physical networks, which groups have interested listeners. In any given subnet, one multicast router acts as an IGMP querier. The IGMP querier sends out the following types of queries to hosts:

- General query—Asks whether any host is listening to any group.
- Group-specific query—(IGMPv2 and IGMPv3 only) Asks whether any host is listening to a specific multicast group. This query is sent in response to a host leaving the multicast group and allows the router to quickly determine if any remaining hosts are interested in the group.
- Group-and-source-specific query—(IGMPv3 only) Asks whether any host is listening to group multicast traffic from a specific multicast source. This query is sent in response to a host indicating that it is not longer interested in receiving group multicast traffic from the multicast source and allows the router to quickly determine any remaining hosts are interested in receiving group multicast traffic from that source.

Hosts that are multicast listeners send the following kinds of messages:

- Membership report—Indicates that the host wants to join a particular multicast group.
- Leave report—(IGMPv2 and IGMPv3 only) Indicates that the host wants to leave a particular multicast group.

How Hosts Join and Leave Multicast Groups

Hosts can join multicast groups in either of two ways:

- By sending an unsolicited IGMP join message to a multicast router that specifies the IP multicast group that the host is attempting to join.
- By sending an IGMP join message in response to a general query from a multicast router.

A multicast router continues to forward multicast traffic to a VLAN provided that at least one host on that VLAN responds to the periodic general IGMP queries. For a host to remain a member of a multicast group, therefore, it must continue to respond to the periodic general IGMP queries.

Hosts can leave a multicast group in either of two ways:

- By not responding to periodic queries within a set interval of time. This results in what is known as a "silent leave." This is the only method available to IGMPv1 hosts.
- By sending a leave report. This method can be used by IGMPv2 and IGMPv3 hosts.

NOTE: If a host is connected to the switch through a hub, the host does not automatically leave the multicast group if it disconnects from the hub. The host remains a member of the group until group membership times out and a silent leave occurs. If another host connects to the hub port before the silent leave occurs, the new host might receive the group multicast traffic until the silent leave, even though it never sent an membership report.

Support for IGMPv3 Multicast Sources

In IGMPv3, a host can send a membership report that includes a list of source addresses. When the host sends a membership report in INCLUDE mode, the host is interested in group multicast traffic only from those sources in the source address list. If host sends a membership report in EXCLUDE mode, the host is interested in group multicast traffic from any source *except* the sources in the source address list. A host can also send an EXCLUDE report in which the source-list parameter is empty, which is known as an EXCLUDE NULL report. An EXCLUDE NULL report indicates that the host wants to join the multicast group and receive packets from all sources.

EX Series switches support IGMPv3 membership reports that are in INCLUDE and EXCLUDE mode. However, EX Series switches do not support forwarding on a per-source basis. Instead, a switch consolidates all INCLUDE and EXCLUDE mode reports it receives on a VLAN for a specified group into a single route that includes all multicast sources for

that group, with the next hop being all interfaces that have interested receivers for the group. As a result, interested receivers on the VLAN can receive traffic from a source that they did not include in their INCLUDE report or from a source they excluded in their EXCLUDE report. For example, if Host 1 wants traffic for G from Source A and Host 2 wants traffic for G from Source B, they both receive traffic for G regardless of whether A or B sends the traffic.

IGMP Snooping and Forwarding Interfaces

To determine how to forward multicast traffic, a switch with IGMP snooping enabled maintains information about the following interfaces in its multicast forwarding table:

- Multicast-router interfaces—These interfaces lead toward multicast routers or IGMP queriers.
- Group-member interfaces—These interfaces lead toward hosts that are members of multicast groups.

The switch learns about these interfaces by monitoring IGMP traffic. If an interface receives IGMP queries or Protocol Independent Multicast (PIM) updates, the switch adds the interface to its multicast forwarding table as a multicast-router interface. If an interface receives membership reports for a multicast group, the switch adds the interface to its multicast forwarding table as a group-member interface.

Table entries for interfaces that the switch learns about are subject to aging. For example, if a learned multicast-router interface does not receive IGMP queries or PIM hellos within a certain interval, the switch removes the entry for that interface from its multicast forwarding table.

NOTE: **For a switch to learn multicast-router interfaces and group-member interfaces, an IGMP querier must exist in the network. For the switch itself to function as an IGMP querier, IGMP must be enabled on the switch.**

You can statically configure an interface to be a multicast-router interface or a group-member interface. The switch adds a static interface to its multicast forwarding table without having to learn about the interface, and the entry in the table is not subject to aging. You can have a mix of statically configured and dynamically learned interfaces on a switch.

General Forwarding Rules

Multicast traffic received on a switch interface in a VLAN on which IGMP snooping is enabled is forwarded according to the following rules.

IGMP traffic is forwarded as follows:

- IGMP general queries received on a multicast-router interface are forwarded to all other interfaces in the VLAN.
- IGMP group-specific queries received on a multicast-router interface are forwarded to only those interfaces in the VLAN that are members of the group.

- IGMP reports received on a host interface are forwarded to multicast-router interfaces in the same VLAN, but not to the other host interfaces in the VLAN.

Multicast traffic that is not IGMP traffic is forwarded as follows:

- A multicast packet with a destination address of 224.0.0.0/24 is flooded to all other interfaces on the VLAN.
- An unregistered multicast packet—that is, a packet for a group that has no current members—is forwarded to all multicast-router interfaces in the VLAN.
- A registered multicast packet is forwarded only to those host interfaces in the VLAN that are members of the multicast group and to all multicast-router interfaces in the VLAN.

Examples of IGMP Snooping Multicast Forwarding

The following examples are provided to illustrate how IGMP snooping forwards multicast traffic in different topologies:

- Scenario 1: Switch Forwarding Multicast Traffic to a Multicast Router and Hosts on page 7
- Scenario 2: Switch Forwarding Multicast Traffic to Another Switch on page 8
- Scenario 3: Switch Connected to Hosts Only (No IGMP Querier) on page 9
- Scenario 4: Layer 2/Layer 3 Switch Forwarding Multicast Traffic Between VLANs on page 10

Scenario 1: Switch Forwarding Multicast Traffic to a Multicast Router and Hosts

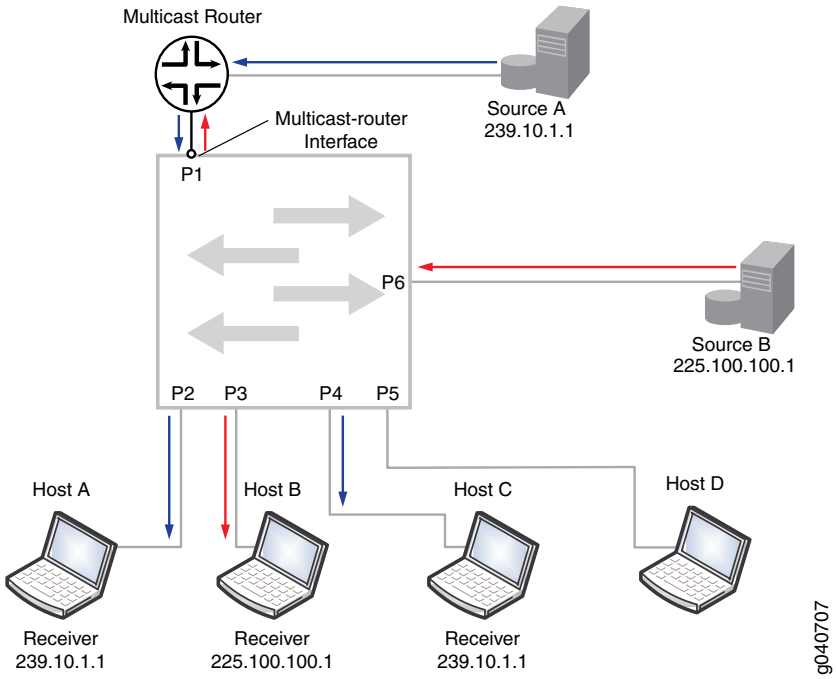
In the topology shown in Figure 2 on page 8, a switch acting as a Layer 2 device receives multicast traffic belonging to multicast group **239.10.1.1** from Source A, which is connected to the multicast router. It also receives multicast traffic belonging to multicast group **225.100.100.1** from Source B, which is connected directly to the switch. All interfaces on the switch belong to the same VLAN.

Because the switch receives IGMP queries from the multicast router on interface P1, IGMP snooping learns that interface P1 is a multicast-router interface and adds the interface to its multicast cache table. It forwards any IGMP general queries it receives on this interface to all host interfaces on the switch, and, in turn, forwards membership reports it receives from hosts to the multicast-router interface.

In the example, Hosts A and C have responded to the membership queries with membership reports for group **239.10.1.1**. IGMP snooping adds interfaces P2 and P4 to its multicast cache table as member interfaces for group **239.10.1.1**. It forwards the group multicast traffic received from Source A to Hosts A and C, but not to Hosts B and D.

Host B has responded to the membership queries with a membership report for group **225.100.100.1**. The switch adds interface P3 to its multicast cache table as a member interface for group **225.100.100.1** and forwards multicast traffic it receives from Source B to Host B. The switch also forwards the multicast traffic it receives from Source B to the multicast-router interface P1.

Figure 2: Scenario 1: Switch Forwarding Multicast Traffic to a Multicast Router and Hosts

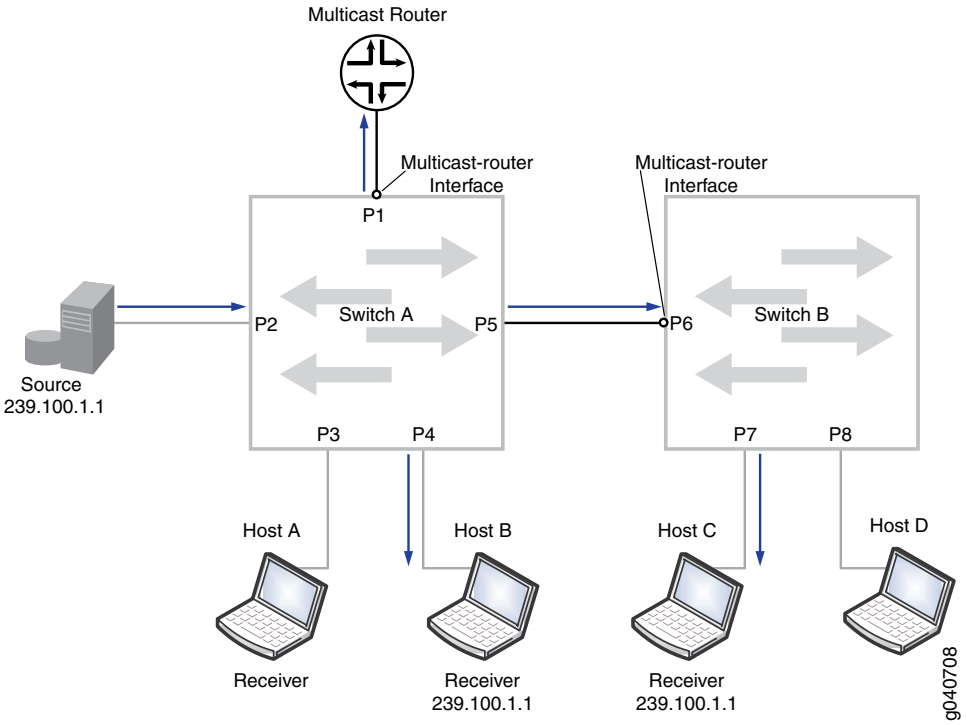


Scenario 2: Switch Forwarding Multicast Traffic to Another Switch

In the topology show in Figure 3 on page 9, a multicast source is connected to Switch A. Switch A in turn is connected to another switch, Switch B. Hosts on both Switch A and B are potential members of the multicast group. Both switches are acting as Layer 2 devices and all interfaces on the switches are members of the same VLAN.

Switch A receives IGMP queries from the multicast router on interface P1, making interface P1 a multicast-router interface for Switch A. Switch A forwards all general IGMP queries it receives on this interface to the other interfaces on the switch, including the interface connecting Switch B. Because Switch B receives the forwarded IGMP queries on interface P6, P6 is the multicast-router interface for Switch B. Switch B forwards the group membership report it receives from Host C to Switch A through its multicast-router interface. Switch A forwards the membership report to its multicast-router interface, includes interface P5 in its multicast cache table as a group-member interface, and forwards multicast traffic from the source to Switch B.

Figure 3: Scenario 2: Switch Forwarding Multicast Traffic to Another Switch



In certain implementations, you might have to configure P6 on Switch B as a static multicast-router interface to avoid a delay in a host receiving multicast traffic. For example, if Switch B receives unsolicited membership reports from its hosts before it learns which interface is its multicast-router interface, it does not forward those reports to Switch A. If Switch A then receives multicast traffic, it does not forward the traffic to Switch B, because it has not received any membership reports on interface P5. This issue will resolve when the multicast router sends out its next general query; however, it can cause a delay in the host receiving multicast traffic. You can statically configure interface P6 as a multicast-router interface to solve this issue.

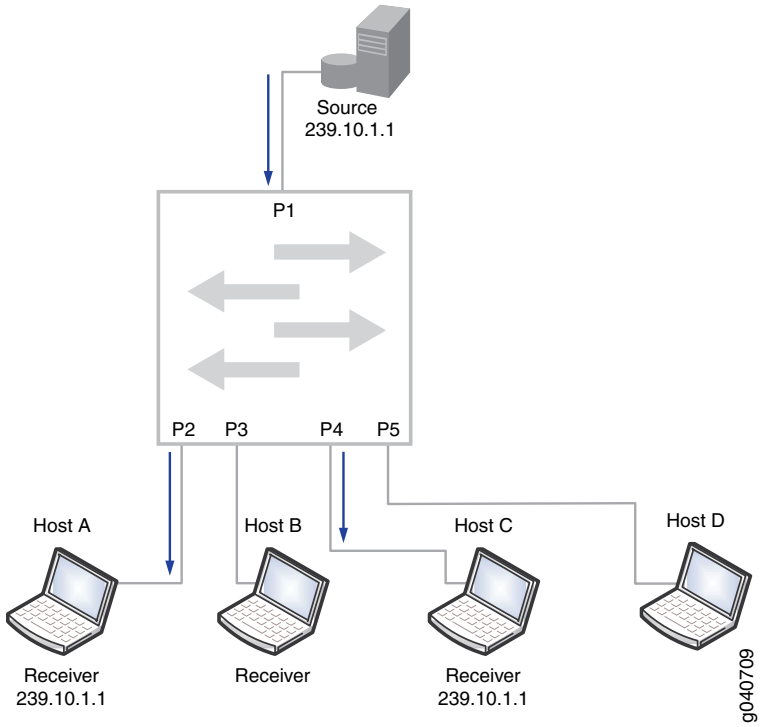
Scenario 3: Switch Connected to Hosts Only (No IGMP Querier)

In the topology shown in Figure 4 on page 10, a switch is connected to a multicast source and to hosts. There is no multicast router in this topology—hence there is no IGMP querier. Without an IGMP querier to respond to, a host does not send periodic membership reports. As a result, even if the host sends an unsolicited join to join a multicast group, its membership in the multicast group times out.

For IGMP snooping to work correctly in this network so that the switch forwards multicast traffic to Hosts A and C only, you can either:

- Configure interfaces P2 and P4 as static group-member interfaces.
- Configure a routed VLAN interface (RVI) on the VLAN and enable IGMP on it. In this case, the switch itself acts as an IGMP querier, and the hosts can dynamically join the multicast group and refresh their group membership by responding to the queries.

Figure 4: Scenario 3: Switch Connected to Hosts Only (No IGMP Querier)

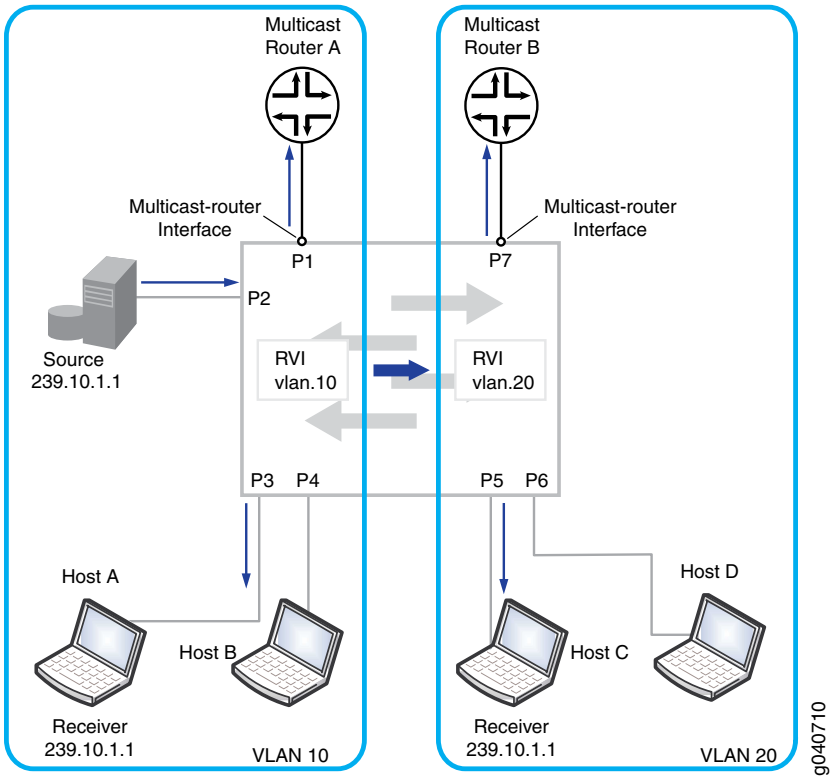


Scenario 4: Layer 2/Layer 3 Switch Forwarding Multicast Traffic Between VLANs

In the topology shown in Figure 5 on page 11, a multicast source, Multicast Router A, and Hosts A and B are connected to the switch and are in VLAN 10. Multicast Router B and Hosts C and D are also connected to the switch and are in VLAN 20.

In a pure Layer 2 environment, traffic is not forwarded between VLANs. For Host C to receive the multicast traffic from the source on VLAN 10, RVIs must be created on VLAN 10 and VLAN 20 to permit routing of the multicast traffic between the VLANs. In addition, PIM must be enabled on the switch to perform the multicast routing.

Figure 5: Scenario 4: Layer 2/Layer 3 Switch Forwarding Multicast Traffic Between VLANs



Related Documentation

- *Understanding Multicast VLAN Registration*
- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*
- *Configuring Routed VLAN Interfaces (CLI Procedure)*

PART 2

Configuration

CHAPTER 2

Configuration Examples

Example: Configuring IGMP Snooping

NOTE: This example uses Junos OS for EX Series switches with support for the Enhanced Layer 2 Software (ELS) configuration style. If your switch runs software that does not support ELS, see, *Example: Configuring IGMP Snooping on EX Series Switches*. For ELS details, see, *Getting Started with Enhanced Layer 2 Software*.

You can enable IGMP snooping on a VLAN to constrain the flooding of IPv4 multicast traffic on a VLAN. When IGMP snooping is enabled, a switch examines IGMP messages between hosts and multicast routers and learns which hosts are interested in receiving multicast traffic for a multicast group. Based on what it learns, the switch then forwards multicast traffic only to those interfaces that are connected to relevant receivers instead of flooding the traffic to all interfaces.

This example describes how to configure IGMP snooping:

Requirements

This example uses the following hardware and software components:

- One EX4300 Series switch
- Junos OS Release 13.2X50-D10 or later for EX Series switches

Before you configure IGMP snooping, be sure you have:

- Configured a VLAN, vlan100, on the switch
- Assigned interfaces ge-0/0/0, ge-0/0/1, ge-0/0/2, and ge-0/0/12 to vlan100

- Configured ge-0/0/12 as a trunk interface

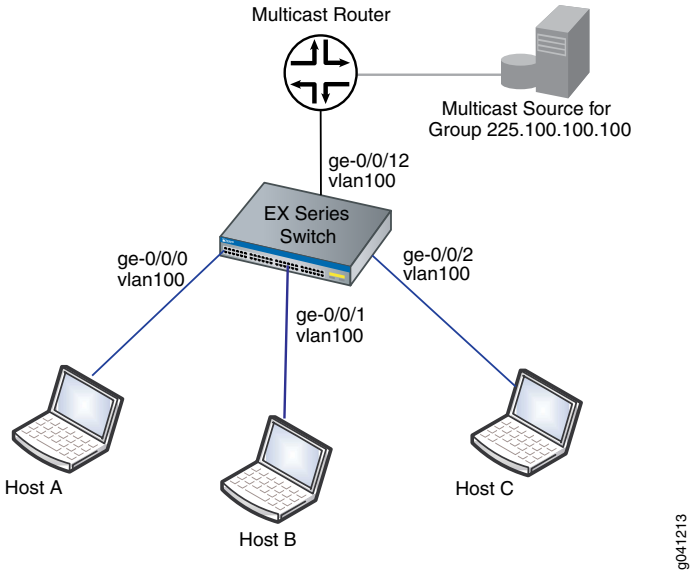
See *Configuring VLANs for EX Series Switches (CLI Procedure)*.

Overview and Topology

In this example, interfaces ge-0/0/0, ge-0/0/1, and ge-0/0/2 on the switch are in vlan100 and are connected to hosts that are potential multicast receivers. Interface ge-0/0/12, a trunk interface also in vlan100, is connected to a multicast router. The router acts as the IGMP querier and forwards multicast traffic for group 225.100.100.100 to the switch from a multicast source.

The sample topology is illustrated in Figure 6 on page 16.

Figure 6: IGMP Snooping Topology Sample Topology



In this sample topology, the multicast router forwards multicast traffic to the switch from the source when it receives a membership report for group 255.100.100.100 from one of the hosts—for example, Host B. If IGMP snooping is not enabled on vlan100, the switch floods the multicast traffic on all interfaces in vlan100 (except for interface ge-0/0/12). If IGMP snooping is enabled on vlan100, the switch monitors the IGMP messages between the hosts and router, allowing it to determine that only Host B is interested in receiving the multicast traffic. The switch then forwards the multicast traffic only to interface ge-0/0/1.

This example shows how to perform the following optional configurations, which can reduce group join and leave latency:

- Configure immediate leave on the VLAN. When immediate leave is configured, the switch stops forwarding multicast traffic on an interface when it detects that the last member of the multicast group has left the group. If immediate leave is not configured, the switch waits until the group-specific queries time out before it stops forwarding traffic.

Immediate leave is supported by IGMP version 2 (IGMPv2) and IGMPv3. With IGMPv2, we recommend that you configure immediate leave only when there is only one IGMP host on an interface. In IGMPv2, only one host on a interface sends a membership report in response to a group-specific query—any other interested hosts suppress their reports to avoid a flood of reports for the same group. This report-suppression feature implies that the switch knows about only one interested host at any given time.

- Configure ge-0/0/12 as a static multicast-router interface. In this topology, ge-0/0/12 always leads to the multicast router. By statically configuring ge-0/0/12 as a multicast-router interface, you avoid any delay imposed by the switch having to learn that ge-0/0/12 is a multicast-router interface.

Configuration

To configure IGMP snooping on a switch:

CLI Quick Configuration

To quickly configure IGMP snooping, copy the following commands and paste them into the switch terminal window:

```
[edit]
set protocols igmp-snooping vlan vlan100 immediate-leave
set protocols igmp-snooping vlan vlan100 interface ge-0/0/12 multicast-router-interface
```

Step-by-Step Procedure

To configure IGMP snooping on vlan100:

1. Configure the switch to immediately remove a group membership from an interface when it receives a leave report from the last member of the group on the interface:

   ```
   [edit protocols]
   user@switch# set igmp-snooping vlan vlan100 immediate-leave
   ```

2. Statically configure interface ge-0/0/12 as a multicast-router interface:

   ```
   [edit protocols]
   user@switch# set igmp-snooping vlan vlan100 interface ge-0/0/12
   multicast-router-interface
   ```

Results

Check the results of the configuration:

```
[edit protocols]
user@switch# show igmp-snooping
vlan vlan100 {
    immediate-leave;
    interface ge-0/0/12.0 {
        multicast-router-interface;
    }
}
```

Verifying IGMP Snooping Operation

To verify that IGMP snooping is operating as configured, perform the following task:

- Displaying IGMP Snooping Information for VLAN vlan100 on page 17

Displaying IGMP Snooping Information for VLAN vlan100

Purpose

Verify that IGMP snooping is enabled on vlan100 and that ge-0/0/12 is recognized as a multicast-router interface.

Action Enter the following command:

```
user@switch>show igmp snooping membership
VLAN: vlan100
    Interfaces: ge-0/0/12.0,
```

Meaning By showing information for vlan100, the command output confirms that IGMP snooping is configured on the VLAN. Interface ge-0/0/12.0 is listed as a multicast-router interface, as configured. Because none of the host interfaces are listed, none of the hosts are currently receivers for the multicast group.

Related Documentation

- *Configuring IGMP Snooping (CLI Procedure)*
- Verifying IGMP Snooping (CLI Procedure) on page 118
- IGMP Snooping on EX Series Switches Overview on page 3

CHAPTER 3

Configuration Tasks

Configuring IGMP Snooping (CLI Procedure)

NOTE: This topic uses Junos OS for EX Series switches with support for the Enhanced Layer 2 Software (ELS) configuration style. If your switch runs software that does not support ELS, see: *Configuring IGMP Snooping*. For ELS details see, *Getting Started with Enhanced Layer 2 Software*.

Internet Group Management Protoco (IGMP) snooping constrains the flooding of IPv4 multicast traffic on a VLAN. When IGMP snooping is enabled, a switch examines IGMP messages between hosts and multicast routers and learns which hosts are interested in receiving multicast traffic for a multicast group. Based on what it learns, the switch then forwards multicast traffic only to those interfaces connected to interested receivers instead of flooding the traffic to all interfaces. In IGMPv2, only one host on a interface sends a membership report in response to a group-specific query—any other interested hosts suppress their reports to avoid a flood of reports for the same group. This report-suppression feature means that the switch only knows about only one interested host at any given time.

By default, IGMP snooping is enabled on the default VLAN. For many networks, IGMP snooping requires no further configuration.

You can perform the following optional configurations for each VLAN:

- Selectively enable IGMP snooping on specific VLANs.
- Enable immediate leave on a VLAN or all VLANs. Enabling immediate leave ensures that the switch stops forwarding multicast traffic immediately after the last member host on the interface leaves the group.
- Configure an interface as a static multicast-router interface for a VLAN so that the switch does not need to dynamically learn that the interface is a multicast-router interface.

- Configure an interface as a static member of a multicast group so that the switch does not need to dynamically learn the interface's membership.
- Change the value for certain timers and counters to match the values configured on the multicast router serving as the IGMP querier.

This topic covers:

Enabling IGMP Snooping on VLANs

This topic describes how you can selectively enable IGMP snooping on VLANs. It assumes that you are beginning with the factory default configuration.

- To enable IGMP snooping on a VLAN:

```
[edit protocols igmp-snooping]
  user@switch# set vlan vlan-name
```

You can also deactivate the IGMP snooping protocol on the switch without changing the IGMP snooping VLAN configurations:

```
[edit]
user@switch# deactivate protocols igmp-snooping
```

Enabling Immediate Leave

By default, when a switch with IGMP snooping enabled receives an IGMP leave report on a member interface, it waits for hosts on the interface to respond to IGMP group-specific queries to determine whether there still are hosts on the interface interested in receiving the group multicast traffic. If the switch does not see any membership reports for the group within a set interval of time, it removes the interface's group membership from the multicast forwarding table and stops forwarding multicast traffic for the group to the interface.

You can decrease the leave latency created by this default behavior by enabling immediate leave on a VLAN.

When you enable immediate leave on a VLAN, host tracking is also enabled, which allows the switch to keep track of the hosts on an interface that have joined a multicast group. When the switch receives a leave report from the last member of the group, it immediately stops forwarding traffic to the interface and does not wait for the interface group membership to time out.

Immediate leave is supported for both IGMP version 2 (IGMPv2) and IGMPv3. However, with IGMPv2, we recommend that you configure immediate leave only when there is only one IGMP host on an interface.

To enable immediate leave on a VLAN:

```
[edit protocols]
user@switch# set igmp-snooping vlan vlan-name immediate-leave
```

Configuring an Interface as a Multicast-Router Interface

When IGMP snooping is enabled on a switch, the switch determines which interfaces face a multicast router by monitoring interfaces for IGMP queries. If the switch receives these messages on an interface, it adds the interface to its multicast forwarding table as a multicast-router interface.

In addition to dynamically learned interfaces, the multicast forwarding table can include interfaces that you explicitly configure to be multicast-router interfaces. Unlike the table entries for dynamically learned interfaces, table entries for statically configured interfaces are not subject to aging and deletion from the forwarding table.

Examples of when you might want to configure a static multicast-router interface include:

- You have an unusual network configuration that prevents IGMP snooping from reliably learning about a multicast-router interface through monitoring IGMP queries.
- Your implementation does not require an IGMP querier.
- You have a stable topology and want to avoid the delay the dynamic learning process entails.

NOTE: All unregistered multicast packets, whether they are IPv4 or IPv6 packets, are forwarded only to the multicast-router interface.

To configure an interface as a static multicast-router interface:

```
[edit protocols]
user@switch# set igmp-snooping vlan vlan-name interface interface-name
multicast-router-interface
```

For example, to configure ge-0/0/5.0 as a multicast-router interface on a VLAN vlan100 on the switch:

```
[edit protocols]
user@switch# set igmp-snooping vlan vlan100 interface ge-0/0/5.0
multicast-router-interface
```

Configuring Static Group Membership on an Interface

To determine how to forward multicast packets, a switch with IGMP snooping enabled maintains a multicast forwarding table containing a list of host interfaces that have interested listeners for a specific multicast group. The switch learns which host interfaces to add or delete from this table by examining IGMP membership reports as they arrive on interfaces on which IGMP snooping is enabled.

In addition to such dynamically learned interfaces, the multicast forwarding table can include interfaces that you statically configure to be members of multicast groups. When

you configure a static group interface, the switch adds the interface to the forwarding table as a host interface for the group. Unlike an entry for a dynamically learned interface, a static interface entry is not subject to aging and deletion from the forwarding table.

Examples of when you might want to configure static group membership on an interface include:

- You want to simulate an attached multicast receiver for testing purposes.
- The interface has receivers that cannot send IGMP membership reports.
- You want the multicast traffic for a specific group to be immediately available to a receiver without any delay imposed by the dynamic join process.

NOTE: The switch does not simulate IGMP membership reports on behalf of a statically configured interface. Thus a multicast router might be unaware that the switch has an interface that is a member of the multicast group. You can configure a static group interface on the router to ensure that the switch receives the group multicast traffic.

To configure a host interface as a static member of a multicast group:

```
[edit protocols]
user@switch# set igmp-snooping vlan vlan-name interface interface-name static group
 ip-address
```

For example, to configure interface ge-0/0/11.0 in vlan100 as a static member of multicast group 225.0.0.1:

```
[edit protocols]
user@switch# set igmp-snooping vlan vlan100 interface ge-0/0/11.0 static group
225.0.0.1
```

Changing the Timer and Counter Values

IGMP uses various timers and counters to determine how often an IGMP querier sends out membership queries and when group memberships time out. On EX Series switches, the default values of the IGMP and IGMP snooping timers and counters are set to the values recommended in RFC 2236, *Internet Group Management Protocol, Version 2*. These values work well for most multicast implementations.

There might be cases, however, where you might want to modify the timer and counter values—for example, to reduce burstiness, to reduce leave latency, or to adjust for expected packet loss on a subnet. If you change a timer or counter value for the IGMP querier on a VLAN, we recommend that you change the value for all multicast routers and switches on the VLAN so that all devices time out group memberships at approximately the same time.

You can configure the following timers and counters on a switch:

- **query-interval**—The length of time the IGMP querier waits between sending general queries (the default is 125 seconds). You can change this interval to tune the number

of IGMP messages on the subnet; larger values cause general queries to be sent less often.

You cannot configure this value directly for IGMP snooping. IGMP snooping inherits the value from the IGMP value configured on the switch, which is applied to all VLANs on the switch.

To configure the IGMP **query-interval**:

```
[edit protocols]
user@switch# set igmp-snooping vlan
vlan-name query-interval seconds
```

- **query-response-interval**—The maximum length of time the host can wait until it responds (the default is 10 seconds). You can change this interval to adjust the burst peaks of IGMP messages on the subnet. Set a larger interval to make the traffic less bursty.

  You cannot configure this value directly for IGMP snooping. IGMP snooping inherits the value from the IGMP value configured on the switch, which is applied to all VLANs on the switch.

  To configure the IGMP query-response-interval:

  ```
  [edit protocols]
  user@switch# set igmp-snooping vlan vlan-name

  query-response-interval seconds
  ```

- **query-last-member-interval**—The length of time the IGMP querier waits between sending group-specific membership queries (the default is 1 second). The IGMP querier sends a group-specific query after receiving a leave report from a host. You can decrease this interval to reduce the amount of time it takes for multicast traffic to stop forwarding traffic after the last member leaves a group.

  You cannot configure this value directly for IGMP snooping. IGMP snooping inherits the value from the IGMP value configured on the switch, which is applied to all VLANs on the switch.

  To configure the IGMP **query-last-member-interval**:

  ```
  [edit protocols]
  user@switch# set igmp-snooping vlan vlan-name query-last-member-interval seconds
  ```

- **robust-count**—The number of times the querier resends a general membership query or a group-specific membership query (the default is 2 times). You can increase this count to tune for higher expected packet loss.

  For IGMP snooping, you can configure **robust-count** for a specific VLAN. If a VLAN does not have **robust-count** configured, the robust-count value is the value configured for IGMP.

  To configure robust-count for IGMP snooping on a VLAN:

  ```
  [edit protocols]
  user@switch# set igmp-snooping vlan vlan-name robust-count number
  ```

The values configured for **query-interval**, **query-response-interval**, and **robust-count** determine the multicast listener interval—the length of time the switch waits for a group membership report after a general query before removing a multicast group from its multicast forwarding table. The switch calculates the multicast listener interval by multiplying **query-interval** by the **robust-count** and then adding **query-response-interval** to the product:

(**query-interval** * **robust-count**) + **query-response-interval** = multicast listener interval.

For example, the multicast listener interval is 260 seconds when the default settings for **query-interval**, **query-response-interval**, and **robust-count** are used:

(125 * 2) + 10 = 260

You can display the time remaining in the multicast listener interval before a group times out by using the **show igmp-snooping membership** command.

Related Documentation

- Example: Configuring IGMP Snooping on page 15
- Verifying IGMP Snooping (CLI Procedure) on page 118
- IGMP Snooping on EX Series Switches Overview on page 3

Configuring IGMP Snooping (J-Web Procedure)

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

IGMP snooping regulates multicast traffic in a switched network. With IGMP snooping enabled, the EX Series switch monitors the IGMP transmissions between a host (a network device) and a multicast router, keeping track of the multicast groups and associated member interfaces. The switch uses that information to make intelligent multicast-forwarding decisions and forward traffic to the intended destination interfaces.

You can configure IGMP snooping on one or more VLANs to allow the switch to examine IGMP packets and make forwarding decisions based on packet content. By default, IGMP snooping is enabled on EX Series switches.

To enable IGMP snooping and configure individual options by using the J-Web interface:

1. Select **Configure** > **Switching** > **IGMP Snooping**.

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

2. Click one of the following options:

- **Add**—Creates an IGMP snooping configuration for the VLAN.
- **Edit**—Modifies an IGMP snooping configuration for the VLAN.
- **Delete**—Deletes a selected VLAN from the IGMP snooping configuration.

When you are adding or editing an IGMP snooping configuration, enter information as described in Table 3 on page 25.

3. Click **OK** to apply changes to the configuration or click **Cancel** to cancel without saving changes.

To disable IGMP snooping on a VLAN, select the VLAN from the list and click **Disable**.

NOTE: **The Disable option is not available for EX4300 switches.**

Table 3: IGMP Snooping Configuration Fields

Field	Function	Your Action
VLAN Name	Specifies the VLAN on which to enable IGMP snooping.	Select a VLAN from the list to add it to the snooping configuration.
Immediate Leave	Immediately removes a multicast group membership from an interface when it receives a leave message from that interface without waiting for any other IGMP messages to be exchanged (IGMP version 2 and IGMP version 3 only).	To enable the option, select the check box. To disable the option, clear the check box.
Robust Count	Specifies the number of timeout intervals the switch waits before timing out a multicast group.	Type a value.

Table 3: IGMP Snooping Configuration Fields *(continued)*

Field	Function	Your Action
Interfaces List	Statically configures an interface as a switching interface toward a multicast router or as a member of a multicast group.	Click one of the following options: • Add—Adds an interface to the IGMP snooping configuration. 1. Select an interface from the list. For an EX8200 Virtual Chassis configuration, select the member, FPC, and the interface from the list. 2. Select **Multicast Router Interface**. 3. Type the maximum number of groups an interface can join. 4. In **Static**, choose one: ◦ Click **Add**, type a group IP address, and click **OK**. ◦ Select a group and click **Remove** to remove the group membership. • Edit—Edits the interface settings for the IGMP snooping configuration. • Remove—Deletes an interface configured for IGMP snooping.

Related Documentation

- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*
- IGMP Snooping on EX Series Switches Overview on page 3

Configuring IGMP Snooping Tracing Operations (CLI Procedure)

By enabling tracing operations for IGMP snooping, you can record detailed messages about the operation of the protocol, such as the various types of protocol packets sent and received. Table 4 on page 26 describes the tracing operations you can enable and the flags used to specify them in the tracing configuration.

Table 4: Supported Tracing Operations for IGMP Snooping

Tracing Operation	Flag
Trace all (equivalent of including all flags).	**all**
Trace general IGMP snooping protocol events.	**general**
Trace communication over routing socket events.	**krt**
Trace leave reports (IGMPv2 and IGMPv3 only).	**leave**

Table 4: Supported Tracing Operations for IGMP Snooping *(continued)*

Tracing Operation	Flag
Trace nexthop-related events.	**nexthop**
Trace normal IGMP snooping protocol events. If you do not specify this flag, only unusual or abnormal operations are traced.	**normal**
Trace all IGMP packets.	**packets**
Trace policy processing.	**policy**
Trace IGMP membership query messages.	**query**
Trace membership reports	**report**
Trace routing information.	**route**
Trace state transitions.	**state**
Trace routing protocol task processing.	**task**
Trace timer processing.	**timer**
Trace VLAN-related events.	**vlan**

This topic covers:

- Configuring Tracing Operations on page 27
- Viewing, Stopping, and Restarting Tracing Operations on page 28

Configuring Tracing Operations

To configure tracing operations for IGMP snooping:

1. Configure the filename for the trace file:

   ```
   [edit protocols igmp-snooping ]
   user@switch# set traceoptions file filename
   ```

   For example:

   ```
   [edit protocols igmp-snooping ]
   user@switch# set traceoptions file mld-snoop-trace
   ```

2. (Optional) Configure the maximum number of trace files and size of the trace files:

   ```
   [edit protocols igmp-snooping ]
   user@switch # set file files number size size
   ```

   For example:

   ```
   [edit protocols igmp-snooping ]
   user@switch # set traceoptions file files 5 size 1m
   ```

causes the contents of the trace file to be emptied and archived in a .gz file when the file reaches 1 MB. Four archive files are maintained, the contents of which are rotated whenever the current active trace file is archived.

If you omit this step, the maximum number of trace files defaults to 10, with the maximum file size defaulting to 128 K.

3. Specify one of the tracing flags shown in Table 4 on page 26:

```
[edit protocols igmp-snooping ]
user@switch # set traceoptions flag flagname
```

For example, to perform trace operations on VLAN-related events and IGMP query messages:

```
[edit protocols igmp-snooping ]
user@switch# set traceoptions flag vlan
```

```
[edit protocols igmp-snooping ]
user@switch# set traceoptions flag query
```

Viewing, Stopping, and Restarting Tracing Operations

When you commit the configuration, tracing operations begin. You can view the trace file in the **/var/log** directory. For example:

```
user@switch> file show /var/log/igmp-snoop-trace
```

You can stop and restart tracing operations by deactivating and reactivating the configuration:

```
[edit]
user@switch# deactivate protocols igmp-snooping traceoptions
```

```
[edit]
user@switch# activate protocols igmp-snooping traceoptions
```

Related Documentation

- *Configuring IGMP Snooping (CLI Procedure)*
- *Tracing and Logging Junos OS Operations*

CHAPTER 4

Configuration Statements

[edit protocols] Configuration Statement Hierarchy on EX Series Switches

Each of the following topics lists the statements at a subhierarchy of the **[edit protocols]** hierarchy:

- *[edit protocols bfd] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols bgp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols connections] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols dcbx] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols dot1x] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols igmp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols igmp-snooping] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols isis] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols lacp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols link-management] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols lldp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols lldp-med] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols mld] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols mld-snooping] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols mpls] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols msdp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols mstp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols mvrp] Configuration Statement Hierarchy on EX Series Switches*

- *[edit protocols neighbor-discovery] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols oam] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols ospf] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols ospf3] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols pim] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols rip] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols ripng] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols router-advertisement] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols router-discovery] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols rstp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols rsvp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols sflow] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols stp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols uplink-failure-detection] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols vrrp] Configuration Statement Hierarchy on EX Series Switches*
- *[edit protocols vstp] Configuration Statement Hierarchy on EX Series Switches*

Related Documentation

- *EX Series Switch Software Features Overview*
- *EX Series Virtual Chassis Software Features Overview*

[edit protocols igmp-snooping] Configuration Statement Hierarchy

This topic lists supported and unsupported configuration statements in the **[edit protocols igmp-snooping]** hierarchy level on EX Series switches.

- *Supported* statements are those that you can use to configure some aspect of a software feature on the switch.
- *Unsupported* statements are those that appear in the command-line interface (CLI) on the switch, but that have no effect on switch operation if you configure them.
- Not all features are supported on all switch platforms. For detailed information about feature support on specific EX Series switch platforms, see *EX Series Switch Software Features Overview*.

This topic lists:

Supported Statements in the [edit protocols igmp-snooping] Hierarchy Level

The following hierarchy shows the **[edit protocols igmp-snooping]** configuration statements supported on EX Series switches:

```
protocols {
    igmp-snooping {
        vlan vlan-name {
            immediate-leave;
                interface interface-name {
                    group-limit <1..65535>
                    host-only-interface
                    multicast-router-interface;
                    immediate-leave;
                    static {
                        group multicast-ip-address {
                            source < >
                        }
                    }
                }
            }
            l2-querier {
                source-address ip-address;
            }
            proxy {
                source-address ip-address;
            }
            query-interval number;
            query-last-member-interval number;
            query-response-interval number;
            robust-count number;
            traceoptions {
                file filename <files number> <no-stamp> <replace> <size maximum-file-size>
                    <world-readable | no-world-readable>;
                flag flag <flag-modifier>;
            }
        }
    }
}
```

Unsupported Statements in the [edit protocols igmp-snooping] Hierarchy Level

All statements in the **[edit protocols igmp-snooping]** hierarchy level that are displayed in the command-line interface (CLI) on the switch are supported on the switch and operate as documented.

Related Documentation

- [edit protocols] Configuration Statement Hierarchy on EX Series Switches on page 31

accounting (Protocols IGMP Interface)

Syntax (accounting | no-accounting);

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*],
[edit protocols igmp interface *interface-name*]

Release Information Statement introduced in Junos OS Release 8.5.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Enable or disable the collection of IGMP join and leave event statistics for an interface.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Recording IGMP Join and Leave Events*

accounting (Protocols IGMP)

Syntax accounting;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information Statement introduced in Junos OS Release 8.5.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Enable the collection of IGMP join and leave event statistics on the system.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Recording IGMP Join and Leave Events*

address (Anycast RPs)

Syntax address *address* <forward-msdp-sa>;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp local (inet | inet6) anycast-pim rp-set],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local (inet | inet6) anycast-pim rp-set],
[edit protocols pim rp local (inet | inet6) anycast-pim rp-set],
[edit routing-instances *routing-instance-name* protocols pim rp local (inet | inet6) anycast-pim rp-set]

Release Information Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the anycast rendezvous point (RP) addresses in the RP set. Multiple addresses can be configured in an RP set. If the RP has peer Multicast Source Discovery Protocol (MSDP) connections, then the RP must forward MSDP source active (SA) messages.

Options ***address***—RP address in an RP set.

forward-msdp-sa—(Optional) Forward MSDP SAs to this address.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

address (Local RPs)

Syntax address *address*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp local family (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)],
[edit protocols pim rp local family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the local rendezvous point (RP) address.

Options ***address***—Local RP address.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Local PIM RPs*

anycast-pim

Syntax

```
anycast-pim {
  rp-set {
    address address <forward-msdp-sa>;
  }
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp local family (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)],
[edit protocols pim rp local family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)]

Release Information

Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure properties for anycast RP using PIM.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring PIM Anycast With or Without MSDP*

assert-timeout

Syntax assert-timeout *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Multicast routing devices running PIM sparse mode often forward the same stream of multicast packets onto the same LAN through the rendezvous-point tree (RPT) and shortest-path tree (SPT). PIM assert messages help routing devices determine which routing device forwards the traffic and prunes the RPT for this group. By default, routing devices enter an assert cycle every 180 seconds. You can configure this assert timeout to be between 5 and 210 seconds.

Options ***seconds***—Time for routing device to wait before another assert message cycle.

Range: 5 through 210 seconds

Default: 180 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring the PIM Assert Timeout*

auto-rp

Syntax

```
auto-rp {
  (announce | discovery | mapping);
  (mapping-agent-election | no-mapping-agent-election);
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information

Statement introduced in Junos OS Release 7.5.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure automatic RP announcement and discovery.

Options

announce—Configure the routing device to listen only for mapping packets and also to advertise itself if it is an RP.

discovery—Configure the routing device to listen only for mapping packets.

mapping—Configures the routing device to announce, listen for and generate mapping packets, and announce that the routing device is eligible to be an RP.

The remaining statement is explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Auto-RP*

bootstrap

Syntax

```
bootstrap {
  family (inet | inet6) {
    export [ policy-names ];
    import [ policy-names ];
    priority number;
  }
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information

Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure parameters to control bootstrap routers and messages.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*

bootstrap-export

Syntax bootstrap-export [*policy-names*];

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more export policies to control outgoing PIM bootstrap messages.

Options ***policy-names***—Name of one or more import policies.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*
- bootstrap-import on page 41

bootstrap-import

Syntax bootstrap-import [*policy-names*];

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more import policies to control incoming PIM bootstrap messages.

Options ***policy-names***—Name of one or more import policies.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*
- bootstrap-export on page 40

bootstrap-priority

Syntax bootstrap-priority *number*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure whether this routing device is eligible to be a bootstrap router. In the case of a tie, the routing device with the highest IP address is elected to be the bootstrap router.

Options *number*—Priority for becoming the bootstrap router. A value of 0 means that the routing device is not eligible to be the bootstrap router.

Range: 0 through 255

Default: 0

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*

data-forwarding

Syntax

```
data-forwarding {
  receiver {
    source-vlans vlan-list;
    install;
  }
  source {
    groups group-prefix;
  }
}
```

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information Statement introduced in Junos OS Release 9.6 for EX Series switches.
Statement introduced in Junos OS Release 12.3 for the QFX Series.

Description Configure the VLAN to be a multicast source VLAN (MVLAN) or a multicast VLAN registration (MVR) receiver VLAN. Each data-forwarding VLAN, which can be a multicast source VLAN (MVLAN) or a multicast receiver VLAN, must have exactly one source statement or exactly one receiver statement. A data-forwarding VLAN can operate only in IGMP version 2 (IGMPv2) mode.

The remaining statements are explained separately.

Default Disabled

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Multicast VLAN Registration*
- *Configuring Multicast VLAN Registration (CLI Procedure)*

dense-groups

Syntax
```
dense-groups {
  addresses;
}
```

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description
Configure which groups are operating in dense mode.

Options
addresses—Address of groups operating in dense mode.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring PIM Sparse-Dense Mode Properties*

disable (IGMP Snooping)

Syntax
```
disable;
```

Hierarchy Level
[edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information
Statement introduced in Junos OS Release 9.2 for EX Series switches.

Description
Disable IGMP snooping on the VLAN. Multicast traffic will be flooded to all interfaces on the VLAN except the source interface.

Default
If you do not include this statement in the configuration for a VLAN, IGMP snooping is enabled on the VLAN.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring IGMP Snooping (CLI Procedure)*
- *show igmp-snooping vlans*

disable (Protocols IGMP)

Syntax disable;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*], [edit protocols igmp interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Disable IGMP on the system.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Disabling IGMP*

disable (PIM)

Syntax disable;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* protocols pim family (inet | inet6)],
[edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* protocols pim rp local family (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)],
[edit protocols pim],
[edit protocols pim family (inet | inet6)],
[edit protocols pim interface *interface-name*],
[edit protocols pim rp local family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim],
[edit routing-instances *routing-instance-name* protocols pim family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)]

Release Information
Statement introduced before Junos OS Release 7.4.
disable statement extended to the **[family]** hierarchy level in Junos OS Release 9.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Explicitly disable PIM at the protocol, interface or family hierarchy levels.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Disabling PIM*
- *disable (PIM Graceful Restart)*

dr-election-on-p2p

Syntax dr-election-on-p2p;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information
Statement introduced in Junos OS Release 9.1.
Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Enable PIM designated router (DR) election on point-to-point (P2P) links.

Default No PIM DR election is performed on point-to-point links.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring PIM Designated Router Election on Point-to-Point Links*

dr-register-policy

Syntax dr-register-policy [*policy-names*];

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information
Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more policies to control outgoing PIM register messages.

Options ***policy-names***—Name of one or more import policies.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Register Message Filters on a PIM RP and DR*
- rp-register-policy on page 91

embedded-rp

Syntax

```
embedded-rp {
  group-ranges {
    destination-ip-prefix</prefix-length>;
  }
  maximum-rps limit;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure properties for embedded IP version 6 (IPv6) RPs.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Embedded RP for IPv6*

export (Protocols PIM Bootstrap)

Syntax

export [*policy-names*];

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp bootstrap family (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp bootstrap family (inet | inet6)],
[edit protocols pim rp bootstrap family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp bootstrap family (inet | inet6)]

Release Information

Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Apply one or more export policies to control outgoing PIM bootstrap messages.

Options

policy-names—Name of one or more import policies.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*
- import (Protocols PIM Bootstrap) on page 60

family (Bootstrap)

Syntax

```
family (inet | inet6) {
  export [ policy-names ];
  import [ policy-names ];
  priority number;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp bootstrap],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp bootstrap],
[edit protocols pim rp bootstrap],
[edit routing-instances *routing-instance-name* protocols pim rp bootstrap]

Release Information

Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure which IP protocol type bootstrap properties to apply.

Options

inet—Apply IP version 4 (IPv4) local RP properties.

inet6—Apply IPv6 local RP properties.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*

family (Local RP)

Syntax

```
family (inet | inet6) {
  disable;
  address address;
  anycast-pim {
    local-address address;
    rp-set {
      address address <forward-msdp-sa>;
    }
  }
  group-ranges {
    destination-ip-prefix</prefix-length>;
  }
  hold-time seconds;
  override;
  priority number;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp local],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local],
[edit protocols pim rp local],
[edit routing-instances *routing-instance-name* protocols pim rp local]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure which IP protocol type local RP properties to apply.

Options

inet—Apply IP version 4 (IPv4) local RP properties.

inet6—Apply IPv6 local RP properties.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring Local PIM RPs*

graceful-restart (Protocols PIM)

Syntax

```
graceful-restart {
  disable;
  no-bidirectional-mode;
  restart-duration seconds;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure PIM sparse mode graceful restart.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Sparse Mode Graceful Restart*

group (IGMP Snooping)

Syntax

group *ip-address*;

Hierarchy Level

[edit protocols igmp-snooping vlan (all | *vlan-name*) interface (all | *interface-name*) static]

Release Information

Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description

Configure a static multicast group on an interface.

Options

ip-address—Valid IP multicast address for the multicast group.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring IGMP Snooping (CLI Procedure)*
- show igmp-snooping membership on page 164

group (Protocols IGMP)

Syntax

```
group multicast-group-address {
  exclude;
  group-count number;
  group-increment increment;
  source ip-address {
    source-count number;
    source-increment increment;
  }
}
```

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name* static], [edit protocols igmp interface *interface-name* static]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify the IGMP multicast group address and (optionally) the source address for the multicast group being statically configured on an interface.

NOTE: You must specify a unique address for each group.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Enabling IGMP Static Group Membership*

group-ranges

Syntax

```
group-ranges {
  destination-ip-prefix</prefix-length>;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp bidirectional address *address*],
[edit logical-systems *logical-system-name* protocols pim rp embedded-rp],
[edit logical-systems *logical-system-name* routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp embedded-rp],
[edit protocols pim rp bidirectional address *address*],
[edit protocols pim rp embedded-rp],
[edit protocols pim rp local family (inet | inet6)],
[edit protocols pim rp static address *address*],
[edit routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit routing-instances *routing-instance-name* protocols pim rp embedded-rp],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp static address *address*]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional RP addresses introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 13.3 for the PTX5000 router.

Description

Configure the address ranges of the multicast groups for which this routing device can be a rendezvous point (RP).

Default

The routing device is eligible to be the RP for all IPv4 or IPv6 groups (224.0.0.0/4 or FF70::/12 to FFF0::/12).

Options

destination-ip-prefix</prefix-length>—Addresses or address ranges for which this routing device can be an RP.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring Local PIM RPs* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Configuring PIM Embedded RP for IPv6* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Example: Configuring Bidirectional PIM*

hello-interval (Protocols PIM)

Syntax hello-interval *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Specify how often the routing device sends PIM hello packets out of an interface.

Options ***seconds***—Length of time between PIM hello packets.

Range: 0 through 255

Default: 30 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- hold-time on page 56
- *Modifying the PIM Hello Interval*

hold-time (Protocols PIM)

Syntax hold-time *seconds*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp bidirectional address *address*],
[edit logical-systems *logical-system-name* routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit protocols pim rp bidirectional address *address*],
[edit protocols pim rp local family (inet | inet6)],
[edit routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional RP addresses introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 13.3 for the PTX5000 router.

Description Specify the time period for which a neighbor is to consider the sending routing device (this routing device) to be operative (up).

Options ***seconds***—Hold time.

Range: 0 through 255

Default: 150 seconds

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Local PIM RPs* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Example: Configuring Bidirectional PIM*

igmp-snooping

Syntax

```
igmp-snooping {
  traceoptions {
    file filename <files number> <no-stamp> <replace> <size size> <world-readable |
      no-world-readable>;
    flag flag <flag-modifier>;
  }
  vlan (all | vlan-name) {
    data-forwarding {
      source {
        groups group-prefix;
      }
      receiver {
        source-vlans vlan-list;
        install;
      }
    }
    disable;
    immediate-leave;
    interface (all | interface-name) {
      multicast-router-interface;
      static {
        group ip-address;
      }
    }
    proxy {
      source-address ip-address;
    }
    robust-count number;
    version version;
  }
}
```

Hierarchy Level [edit protocols]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description Configure IGMP snooping. The factory default configuration enables IGMP snooping on all VLANs.

The remaining statements are explained separately.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*

immediate-leave (Protocols IGMP)

Syntax immediate-leave;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*], [edit protocols igmp interface *interface-name*]

Release Information Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description The immediate leave setting is useful for minimizing the leave latency of IGMP memberships. When this setting is enabled, the routing device leaves the multicast group immediately after the last host leaves the multicast group.

Starting in Junos OS Release 9.3, both IGMP version 2 and IGMP version 3 do host tracking when the **immediate-leave** statement is configured. This means that the multicast group leaves only when the last host leaves. The routing device keeps track of the hosts that send join messages. This allows IGMP to determine when the last host sends a leave message for the multicast group.

When the immediate leave setting is enabled, the device removes an interface from the forwarding-table entry without first sending IGMP group-specific queries to the interface. The interface is pruned from the multicast tree for the multicast group specified in the IGMP leave message. The immediate leave setting ensures optimal bandwidth management for hosts on a switched network, even when multiple multicast groups are being used simultaneously.

When immediate leave is disabled and one host sends a leave group message, the routing device first sends a group query to determine if another receiver responds. If no receiver responds, the routing device removes all hosts on the interface from the multicast group. Immediate leave is disabled by default for both IGMP version 2 and IGMP version 3.

NOTE: Although host tracking is enabled for IGMPv2 and MLDv1 when you enable immediate leave, use immediate leave with these versions only when there is one host on the interface. The reason is that IGMPv2 and MLDv1 use a report suppression mechanism whereby only one host on an interface sends a group join report in response to a membership query. The other interested hosts suppress their reports. The purpose of this mechanism is to avoid a flood of reports for the same group. But it also interferes with host tracking, because the routing device only knows about the one interested host and does not know about the others.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Specifying Immediate-Leave Host Removal for IGMP*

immediate-leave (IGMP Snooping)

Syntax immediate-leave;

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description Configure IGMP snooping immediate leave for the specified VLAN. When you configure immediate leave, host tracking is enabled, which allows the switch to track the hosts that send membership reports. The switch can then determine when the last host on an interface leaves the multicast group and immediately stop forwarding multicast traffic to the interface.

Configuring immediate leave reduces the amount of time it takes for the switch to stop sending multicast traffic to an interface when the last host leaves the group. When immediate leave is disabled, the switch no longer tracks hosts. Instead, whenever it receives a leave report from a host, it sends out a group-specific query to all hosts. If it does not receive any membership reports on the interface in response to the group-specific query within a set interval, it stops forwarding multicast traffic to the interface.

NOTE: Immediate leave is supported for both IGMP version 2 (IGMPv2) and IGMPv3. However, with IGMPv2, we recommend that you configure immediate leave only when there is only one IGMP host on an interface. In IGMPv2, only one host on a interface sends a membership report in response to a general query—any other interested hosts suppress their reports. Report suppression avoids a flood of reports for the same group, but it also interferes with host tracking because the switch knows only about one interested host on the interface at any given time.

Default The immediate-leave feature is disabled.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*

import (Protocols PIM Bootstrap)

Syntax import [*policy-names*];

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp bootstrap (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp bootstrap (inet | inet6)],
[edit protocols pim rp bootstrap (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp bootstrap (inet | inet6)]

Release Information Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more import policies to control incoming PIM bootstrap messages.

Options ***policy-names***—Name of one or more import policies.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*
- export (Protocols PIM Bootstrap) on page 49

import (Protocols PIM)

Syntax import [*policy-names*];

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more policies to routes being imported into the routing table from PIM. Use the **import** statement to filter PIM join messages and prevent them from entering the network.

Options ***policy-names***—Name of one or more policies.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Filtering Incoming PIM Join Messages*

infinity

Syntax infinity [*policy-names*];

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim spt-threshold],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim spt-threshold],
[edit protocols pim spt-threshold],
[edit routing-instances *routing-instance-name* protocols pim spt-threshold]

Release Information Statement introduced in Junos OS Release 8.0.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply one or more policies to set the SPT threshold to infinity for a source-group address pair. Use the **infinity** statement to prevent the last-hop routing device from transitioning from the RPT rooted at the RP to an SPT rooted at the source for that source-group address pair.

Options ***policy-names***—Name of one or more policies.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring the PIM SPT Threshold Policy*

interface (IGMP Snooping)

Syntax

```
interface (all | interface-name) {
  multicast-router-interface;
  static {
    group ip-address;
  }
}
```

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description For IGMP snooping, configure an interface as either a multicast-router interface or as a static member of a multicast group.

Options

all—All interfaces in the VLAN.

interface-name—Name of the interface.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*
- *show igmp-snooping vlans*

interface (Protocols PIM)

Syntax

```
interface (Protocols PIM) (all | interface-name) {
    accept-remote-source;
    disable;
    bfd-liveness-detection {
        authentication {
            algorithmalgorithm-name;
            key-chainkey-chain-name;
            loose-check;
        }
        detection-time {
            threshold milliseconds;
        }
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
        }
        version (0 | 1 | automatic);
    }
    bidirectional {
        df-election {
            backoff-period milliseconds;
            offer-period milliseconds;
            robustness-count number;
        }
    }
    family (inet | inet6) {
        bfd-liveness-detection {
            authentication {
                algorithm algorithm-name;
                key-chain key-chain-name;
                loose-check;
            }
            detection-time {
                threshold milliseconds;
            }
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            multiplier number;
            no-adaptation;
            transmit-interval {
                minimum-interval milliseconds;
                threshold milliseconds;
            }
            version (0 | 1 | automatic);
        }
        disable;
    }
    hello-interval seconds;
```

```
    mode (bidirectional-sparse | bidirectional-sparse-dense | dense | sparse | sparse-dense);
    neighbor-policy [ policy-names ];
    override-interval milliseconds;
    priority number;
    propagation-delay milliseconds;
    reset-tracking-bit;
    version version;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description

Enable PIM on an interface and configure interface-specific properties.

Options

interface-name—Name of the interface. Specify the full interface name, including the physical and logical address components. To configure all interfaces, you can specify **all**.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *PIM on Aggregated Interfaces*

interface (Protocols IGMP)

Syntax

```
interface interface-name {
  disable;
  (accounting | no-accounting);
  group-limit limit;
  group-policy [ policy-names ];
  immediate-leave;
  oif-map map-name;
  passive;
  promiscuous-mode;
  ssm-map ssm-map-name;
  ssm-map-policy ssm-map-policy-name;
  static {
    group multicast-group-address {
      exclude;
      group-count number;
      group-increment increment;
      source ip-address {
        source-count number;
        source-increment increment;
      }
    }
  }
  version version;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description

Enable IGMP on an interface and configure interface-specific properties.

Options

interface-name—Name of the interface. Specify the full interface name, including the physical and logical address components. To configure all interfaces, you can specify **all**.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Enabling IGMP*

join-load-balance

Syntax

```
join-load-balance {
  automatic;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Enable load balancing of PIM join messages across interfaces and routing devices.

Options

automatic—Enables automatic load balancing of PIM join messages. When a new interface or neighbor is introduced into the network, ECMP joins are redistributed with minimal disruption to traffic.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring PIM Make-Before-Break Join Load Balancing*
- *Configuring PIM Join Load Balancing*
- *clear pim join-distribution* in the CLI Explorer

local

Syntax

```
local {
  disable;
  address address;
  family (inet | inet6) {
    disable;
    address address;
    anycast-pim {
      local-address address;
        rp-set {
        address address <forward-msdp-sa>;
      }
    }
    group-ranges {
      destination-ip-prefix</prefix-length>;
    }
    hold-time seconds;
    override;
    priority number;
  }
  group-ranges {
    destination-ip-prefix</prefix-length>;
  }
  hold-time seconds;
  override;
  priority number;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.
The remaining statements are explained separately.

Description

Configure the routing device's RP properties.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring Local PIM RPs*

local-address (Protocols PIM)

Syntax local-address *address*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp local family (inet | inet6) anycast-pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6) anycast-pim],
[edit protocols pim rp local family (inet | inet6) anycast-pim],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6) anycast-pim]

Release Information
Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the routing device local address for the anycast rendezvous point (RP). If this statement is omitted, the router ID is used as this address.

Options ***address***—Anycast RP IPv4 or IPv6 address, depending on **family** configuration.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring PIM Anycast With or Without MSDP*

mapping-agent-election

Syntax (mapping-agent-election | no-mapping-agent-election);

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp auto-rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp auto-rp],
[edit protocols pim rp auto-rp],
[edit routing-instances *routing-instance-name* protocols pim rp auto-rp]

Release Information Statement introduced in Junos OS Release 7.5.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the routing device mapping announcements as a mapping agent.

Options

mapping-agent-election—Mapping agents do not announce mappings when receiving mapping messages from a higher-addressed mapping agent.

no-mapping-agent-election—Mapping agents always announce mappings and do not perform mapping agent election.

Default: mapping-agent-election

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Auto-RP*

maximum-rps

Syntax maximum-rps *limit*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim rp embedded-rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp embedded-rp],
[edit protocols pim rp embedded-rp],
[edit routing-instances *routing-instance-name* protocols pim rp embedded-rp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Limit the number of RPs that the routing device acknowledges.

Options ***limit***—Number of RPs.

Range: 1 through 500

Default: 100

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Embedded RP for IPv6*

mode (Protocols PIM)

Syntax mode (bidirectional-sparse | bidirectional-sparse-dense | dense | sparse | sparse-dense);

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
bidirectional-sparse and **bidirectional-sparse-dense** options introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 13.3 for the PTX5000 router.

Description Configure the PIM mode on the interface.

Options The choice of PIM mode is closely tied to controlling how groups are mapped to PIM modes, as follows:

- **bidirectional-sparse**—Use if all multicast groups are operating in bidirectional, sparse, or SSM mode.
- **bidirectional-sparse-dense**—Use if multicast groups, except those that are specified in the **dense-groups** statement, are operating in bidirectional, sparse, or SSM mode.
- **dense**—Use if all multicast groups are operating in dense mode.
- **sparse**—Use if all multicast groups are operating in sparse mode or SSM mode.
- **sparse-dense**—Use if multicast groups, except those that are specified in the **dense-groups** statement, are operating in sparse mode or SSM mode.

Default: Sparse mode

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Dense Mode Properties* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Configuring PIM Sparse-Dense Mode Properties* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Example: Configuring Bidirectional PIM*

multicast-router-interface (IGMP Snooping)

Syntax multicast-router-interface;

Hierarchy Level
[edit bridge-domains *bridge-domain-name* protocols igmp-snooping interface *interface-name*],
[edit bridge-domains *bridge-domain-name* protocols igmp-snooping vlan *vlan-id* interface *interface-name*],
[edit protocols igmp-snooping vlan (all | *vlan-name*) interface (all | *interface-name*)]
[edit routing-instances *routing-instance-name* bridge-domains *bridge-domain-name* protocols igmp-snooping interface *interface-name*],
[edit routing-instances *routing-instance-name* bridge-domains *bridge-domain-name* protocols vlan *vlan-id* igmp-snooping interface *interface-name*]

Release Information
Statement introduced in Junos OS Release 8.5.
Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description Statically configure the interface as an IGMP snooping multicast-router interface—that is, an interface that faces toward a multicast router or other IGMP querier.

NOTE: If the specified interface is a trunk port, the interface becomes a multicast-routing device interface for all VLANs configured on the trunk port. In addition, all unregistered multicast packets, whether they are IPv4 or IPv6 packets, are forwarded to the multicast routing device interface, even if the interface is configured as a multicast routing device interface only for IGMP snooping.

Configure an interface as a bridge interface toward other multicast routing devices.

Default The interface can either be a host-side or multicast-routing device interface.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Example: Configuring IGMP Snooping*
- *Configuring IGMP Snooping (CLI Procedure)*
- *IGMP Snooping in MC-LAG Active-Active on MX Series Routers Overview*
- *host-only-interface*
- show igmp-snooping membership on page 164

neighbor-policy

Syntax neighbor-policy [*policy-names*];

Hierarchy Level [edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*]

Release Information Statement introduced in Junos OS Release 8.2.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Apply a PIM interface-level policy to filter neighbor IP addresses.

Options ***policy-name***—Name of the policy that filters neighbor IP addresses.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring Interface-Level PIM Neighbor Policies*

pim

Syntax

```
pim {
  disable;
  assert-timeout seconds;
  dense-groups {
    addresses;
  }
  dr-election-on-p2p;
  export;
  family (inet | inet6) {
    disable;
  }
  graceful-restart {
    disable;
    no-bidirectional-mode;
    restart-duration seconds;
  }
import [ policy-names ];
  interface interface-name {
    family (inet | inet6) {
      disable;
      }
      bfd-liveness-detection {
          authentication {
            algorithm algorithm-name;
            key-chain key-chain-name;
          loose-check;
          detection-time {
            threshold milliseconds;
          }
        minimum-interval milliseconds;
          minimum-receive-interval milliseconds;
          multiplier number;
          no-adaptation;
          transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
          }
        version (0 | 1 | automatic);
      }
      accept-remote-source;
      disable;
      bidirectional {
        df-election {
          backoff-period milliseconds;
          offer-period milliseconds;
          robustness-count number;
        }
      }
      family (inet | inet6) {
        disable;
      }
      hello-interval seconds;
```

```
    mode (bidirectional-sparse | bidirectional-sparse-dense | dense | sparse |
      sparse-dense);
    neighbor-policy [ policy-names ];
    override-interval milliseconds;
    priority number;
    propagation-delay milliseconds;
    reset-tracking-bit;
    version version;
  }
  join-load-balance;
  join-prune-timeout;
  mdt {
    data-mdt-reuse;
    group-range multicast-prefix;
    threshold {
      group group-address {
        source source-address {
          rate threshold-rate;
        }
      }
      tunnel-limit limit;
    }
  }
  mvpn {
    autodiscovery {
      inet-mdt;
    }
  }
  nonstop-routing;
  override-interval milliseconds;
  propagation-delay milliseconds;
  reset-tracking-bit;
  rib-group group-name;
  rp {
    auto-rp {
      (announce | discovery | mapping);
      (mapping-agent-election | no-mapping-agent-election);
    }
    bidirectional {
      address address {
        group-ranges {
          destination-ip-prefix</prefix-length>;
        }
        hold-time seconds;
        priority number;
        }
      }
    bootstrap {
      family (inet | inet6) {
        export [ policy-names ];
        import [ policy-names ];
        priority number;
      }
    }
    bootstrap-import [ policy-names ];
    bootstrap-export [ policy-names ];
```

```
bootstrap-priority number;
dr-register-policy [ policy-names ];
embedded-rp {
  group-ranges {
    destination-ip-prefix</prefix-length>;
  }
  maximum-rps limit;
}
group-rp-mapping {
  family (inet | inet6) {
    log-interval seconds;
    maximum limit;
    threshold value;
    }
  }
  log-interval seconds;
  maximum limit;
  threshold value;
  }
}
local {
  family (inet | inet6) {
    address address;
    anycast-pim {
      rp-set {
        address address <forward-msdp-sa>;
      }
      disable;
      local-address address;
    }
    group-ranges {
      destination-ip-prefix</prefix-length>;
    }
    hold-time seconds;
    override;
    priority number;
  }
}
register-limit {
  family (inet | inet6) {
    log-interval seconds;
    maximum limit;
    threshold value;
    }
  }
  log-interval seconds;
  maximum limit;
  threshold value;
  }
}
rp-register-policy [ policy-names ];
spt-threshold {
  infinity [ policy-names ];
}
static {
  address address {
```

```
            override;
            version version;
            group-ranges {
              destination-ip-prefix</prefix-length>;
            }
          }
        }
      }
      rpf-selection {
        group group-address{
          sourcesource-address{
            next-hop next-hop-address;
          }
          wildcard-source {
            next-hop next-hop-address;
          }
        }
        prefix-list prefix-list-addresses {
          source source-address {
            next-hop next-hop-address;
          }
          wildcard-source {
            next-hop next-hop-address;
          }
        }
        sglimit {
          family (inet | inet6) {
            log-interval seconds;
            maximum limit;
            threshold value;
            }
          }
          log-interval seconds;
          maximum limit;
          threshold value;
          }
        }
        traceoptions {
          file filename <files number> <size size> <world-readable | no-world-readable>;
          flag flag <flag-modifier> <disable>;
        }
        tunnel-devices [ mt-fpc/pic/port ];
      }
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols],
[edit protocols],
[edit routing-instances *routing-instance-name* protocols]

Release Information

Statement introduced before Junos OS Release 7.4.
family statement introduced in Junos OS Release 9.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable PIM on the routing device.

The remaining statements are explained separately.

Default PIM is disabled on the routing device.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring Data MDTs and Provider Tunnels Operating in Any-Source Multicast Mode*
- *Configuring PIM Dense Mode Properties*
- *Configuring PIM Sparse-Dense Mode Properties*

priority (PIM Interfaces)

Syntax priority *number*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the routing device's likelihood to be elected as the designated router.

Options *number*—Routing device's priority for becoming the designated router. A higher value corresponds to a higher priority.

Range: 0 through 4294967295

Default: 1 (Each routing device has an equal probability of becoming the DR.)

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Interface Priority for PIM Designated Router Selection*

priority (Bootstrap)

Syntax priority *number*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp bootstrap (inet | inet6)],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp bootstrap (inet | inet6)],
[edit protocols pim rp bootstrap (inet | inet6)],
[edit routing-instances *routing-instance-name* protocols pim rp bootstrap (inet | inet6)]

Release Information
Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the routing device's likelihood to be elected as the bootstrap router.

Options
number—Routing device's priority for becoming the bootstrap router. A higher value corresponds to a higher priority.

Range: 0 through a 32-bit number

Default: 0 (The routing device has the least likelihood of becoming the bootstrap router and sends packets with a priority of 0.)

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring PIM Bootstrap Properties for IPv4*
- *Configuring PIM Bootstrap Properties for IPv4 or IPv6*
- bootstrap-priority on page 42

priority (PIM RPs)

Syntax priority *number*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp bidirectional address *address*],
[edit logical-systems *logical-system-name* routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit protocols pim rp bidirectional address *address*],
[edit protocols pim rp local family (inet | inet6)],
[edit routing-instances *instance-name* protocols pim rp bidirectional address *address*],
[edit routing-instances *routing-instance-name* protocols pim rp local family (inet | inet6)]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional RP addresses introduced in Junos OS Release 12.1.
Statement introduced in Junos OS Release 13.3 for the PTX5000 router.

Description
For PIM-SM, configure this routing device's priority for becoming an RP.

For bidirectional PIM, configure this RP address' priority for becoming an RP.

The bootstrap router uses this field when selecting the list of candidate rendezvous points to send in the bootstrap message. A smaller number increases the likelihood that the routing device or RP address becomes the RP. A priority value of 0 means that bootstrap router can override the group range being advertised by the candidate RP.

Options
number—Priority for becoming an RP. A lower value corresponds to a higher priority.

Range: 0 through 255

Default: 1

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Local PIM RPs* in the *Multicast Protocols Feature Guide for Routing Devices*
- *Example: Configuring Bidirectional PIM*

query-interval (Protocols IGMP)

Syntax query-interval *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify how often the querier routing device sends general host-query messages.

Options *seconds*—Time interval.

Range: 1 through 1024

Default: 125 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Modifying the IGMP Host-Query Message Interval*
- query-last-member-interval (Protocols IGMP) on page 83
- query-response-interval (Protocols IGMP) on page 84

query-last-member-interval (Protocols IGMP)

Syntax query-last-member-interval *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify how often the querier routing device sends group-specific query messages.

Options ***seconds***—Time interval, in fractions of a second or seconds.

Range: 0.1 through 0.9, then in 1-second intervals 1 through 999999

Default: 1 second

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Modifying the IGMP Last-Member Query Interval*
- query-interval (Protocols IGMP) on page 82
- query-response-interval (Protocols IGMP) on page 84

query-response-interval (Protocols IGMP)

Syntax query-response-interval *seconds*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify how long the querier routing device waits to receive a response to a host-query message from a host.

Options ***seconds***—The query response interval must be less than the query interval.

Range: 1 through 1024

Default: 10 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Modifying the IGMP Query Response Interval*
- query-interval (Protocols IGMP) on page 82
- query-last-member-interval (Protocols IGMP) on page 83

receiver

Syntax

```
receiver {
  source-vlans vlan-list;
  install;
}
```

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*) data-forwarding]

Release Information Statement introduced in Junos OS Release 9.6 for EX Series switches.
Statement introduced in Junos OS Release 12.3 for the QFX Series.

Description Configure a VLAN as a multicast receiver VLAN of the multicast VLAN (MVLAN).

The remaining statements are explained separately.

Default Disabled

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Multicast VLAN Registration*
- *Configuring Multicast VLAN Registration (CLI Procedure)*

register-probe-time

Syntax register-probe-time *register-probe-time*;

Hierarchy Level [edit protocols pim rp]

Release Information Statement introduced in Junos OS Release 12.2 for EX Series switches.

Description Specify the amount of time before the register suppression time (RST) expires when a designated switch can send a NULL-Register to the rendezvous point (RP).

Options ***register-probe-time***—Amount of time before the RST expires.

Default: 5 seconds

Range: 5 to 60 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *PIM Overview*
- *Understanding PIM Sparse Mode*

restart-duration (Protocols PIM)

Syntax restart-duration *seconds*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim graceful-restart],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim graceful-restart],
[edit protocols pim graceful-restart],
[edit routing-instances *routing-instance-name* protocols pim graceful-restart]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Configure the duration of the graceful restart interval.

Options
seconds—Time that the routing device waits (in seconds) to complete PIM sparse mode graceful restart.

Range: 30 through 300

Default: 60

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring PIM Sparse Mode Graceful Restart*

rib-group (Protocols PIM)

Syntax

```
rib-group {
    inet group-name;
    inet6 group-name;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Associate a routing table group with PIM.

Options

table-name—Name of the routing table. The name must be one that you defined with the **rib-groups** statement at the **[edit routing-options]** hierarchy level.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring a Dedicated PIM RPF Routing Table*

robust-count (IGMP Snooping)

Syntax robust-count *number*;

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description Configure the number of queries the switch sends before removing a multicast group from the multicast forwarding table. We recommend that the robust count be set to the same value on all multicast routers and switches in the VLAN.

Default The default is the value of the **robust-count** statement configured for IGMP. The default for the IGMP **robust-count** statement is 2.

Options ***number***—Number of queries the switch sends before timing out a multicast group.
Range: 2 through 10

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring IGMP Snooping (CLI Procedure)*

robust-count (Protocols IGMP)

Syntax robust-count *number*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Tune the expected packet loss on a subnet. This factor is used to calculate the group member interval, other querier present interval, and last-member query count.

Options ***number***—Robustness variable.
Range: 2 through 10
Default: 2

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Modifying the IGMP Robustness Variable*

rp

Syntax

```
register-probe-time {
  auto-rp {
    (announce | discovery | mapping);
    (mapping-agent-election | no-mapping-agent-election);
  }
  bidirectional {
    address address {
      group-ranges {
        destination-ip-prefix</prefix-length>;
      }
      hold-time seconds;
      priority number;
      }
    }
  bootstrap {
    family (inet | inet6) {
      export [ policy-names ];
      import [ policy-names ];
      priority number;
    }
  }
  bootstrap-export [ policy-names ];
  bootstrap-import [ policy-names ];
  bootstrap-priority number;
  dr-register-policy [ policy-names ];
  embedded-rp {
    group-ranges {
      destination-ip-prefix</prefix-length>;
    }
    maximum-rps limit;
  }
  group-rp-mapping {
    family (inet | inet6) {
      log-interval seconds;
      maximum limit;
      threshold value;
      }
    }
    log-interval seconds;
    maximum limit;
    threshold value;
    }
  }
  local {
    family (inet | inet6) {
      disable;
      address address;
      anycast-pim {
        local-address address;
          address address <forward-msdp-sa>;
          rp-set {
        }
```

```
        }
        group-ranges {
          destination-ip-prefix</prefix-length>;
        }
        hold-time seconds;
        override;
        priority number;
      }
    }
    register-limit {
      family (inet | inet6) {
        log-interval seconds;
        maximum limit;
        threshold value;
        }
      }
      log-interval seconds;
      maximum limit;
      threshold value;
      }
    }
    register-probe-time register-probe-time;
    }
    rp-register-policy [ policy-names ];
    static {
      address address {
        override;
        version version;
        group-ranges {
          destination-ip-prefix</prefix-length>;
        }
      }
    }
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure the routing device as an actual or potential RP. A routing device can be an RP for more than one group.

The remaining statements are explained separately.

Default

If you do not include the **rp** statement, the routing device can never become the RP.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Understanding PIM Sparse Mode*

rp-register-policy

Syntax
rp-register-policy [*policy-names*];

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information
Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description
Apply one or more policies to control incoming PIM register messages.

Options
policy-names—Name of one or more import policies.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring Register Message Filters on a PIM RP and DR*
- dr-register-policy on page 47

rp-set

Syntax

```
rp-set {
    address address <forward-msdp-sa>;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim local family (inet | inet6) anycast-pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim local family (inet | inet6) anycast-pim],
[edit protocols pim local family (inet | inet6) anycast-pim],
[edit routing-instances *routing-instance-name* protocols pim local family (inet | inet6) anycast-pim]

Release Information

Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure a set of rendezvous point (RP) addresses for anycast RP. You can configure up to 15 RPs.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring PIM Anycast With or Without MSDP*

source (Protocols IGMP)

Syntax

```
source ip-address {
    source-count number;
    source-increment increment;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols igmp interface *interface-name* static group *multicast-group-address*],
[edit protocols igmp interface *interface-name* static group *multicast-group-address*]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description

Specify the IP version 4 (IPv4) unicast source address for the multicast group being statically configured on an interface.

Options

ip-address—IPv4 unicast address.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Enabling IGMP Static Group Membership*

source-vlans

Syntax source-vlans *vlan-list*;

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*) data-forwarding receiver]

Release Information Statement introduced in Junos OS Release 9.6 for EX Series switches.
Statement introduced in Junos OS Release 12.3 for the QFX Series.

Description Specify a list of multicast VLANs (MVLANs) from which this multicast receiver VLAN receives multicast traffic. Either all of these MVLANs must be in proxy mode or none of them can be in proxy mode.

Default Disabled

Options ***vlan-list***—Names of the MVLANs.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Multicast VLAN Registration*
- *Configuring Multicast VLAN Registration (CLI Procedure)*

spt-threshold

Syntax

```
spt-threshold {
  infinity [ policy-names ];
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced in Junos OS Release 8.0.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Set the SPT threshold to infinity for a source-group address pair. Last-hop multicast routing devices running PIM sparse mode can forward the same stream of multicast packets onto the same LAN through an RPT rooted at the RP or an SPT rooted at the source. By default, last-hop routing devices transition to a direct SPT to the source. You can configure this routing device to set the SPT transition value to infinity to prevent this transition for any source-group address pair.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring the PIM SPT Threshold Policy*

ssm-map (Protocols IGMP)

Syntax ssm-map *ssm-map-name*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*],
[edit protocols igmp interface *interface-name*]

Release Information Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Apply an SSM map to an IGMP interface.

Options ***ssm-map-name***—Name of SSM map.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring SSM Mapping*

static (IGMP Snooping)

Syntax
```
static {
  group ip-address;
}
```

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*) interface (all | *interface-name*)]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.

Description Statically define multicast groups on an interface.

The remaining statement is explained separately.

Default No multicast groups are statically defined.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring IGMP Snooping (CLI Procedure)*
- show igmp-snooping membership on page 164

static (Protocols PIM)

Syntax

```
static {
  address address {
    group-ranges {
      destination-ip-prefix</prefix-length>;
    }
    override;
    version version;
  }
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim rp],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp],
[edit protocols pim rp],
[edit routing-instances *routing-instance-name* protocols pim rp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure static RP addresses. The default static RP address is 224.0.0.0/4. To configure other addresses, include one or more **address** statements. You can configure a static RP in a logical system only if the logical system is not directly connected to a source.

For each static RP address, you can optionally specify the PIM version and the groups for which this address can be the RP. The default PIM version is version 1.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Static PIM RP Address on the Non-RP Routing Device*

static (Protocols IGMP)

Syntax

```
static {
  group multicast-group-address {
    exclude;
    group-count number;
    group-increment increment;
    source ip-address {
      source-count number;
      source-increment increment;
    }
  }
}
```

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*], [edit protocols igmp interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Test multicast forwarding on an interface without a receiver host.

The **static** statement simulates IGMP joins on a routing device statically on an interface without any IGMP hosts. It is supported for both IGMPv2 and IGMPv3 joins. This statement is especially useful for testing multicast forwarding on an interface without a receiver host.

NOTE: To prevent joining too many groups accidentally, the **static** statement is not supported with the **interface all** statement.

The remaining statements are explained separately.

Required Privilege Level routing and trace—To view this statement in the configuration.
routing-control and trace-control—To add this statement to the configuration.

Related Documentation

- *Enabling IGMP Static Group Membership*

traceoptions (Protocols PIM)

Syntax

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

Hierarchy Level

[edit logical-systems *logical-system-name* protocols pim],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim],
[edit protocols pim],
[edit routing-instances *routing-instance-name* protocols pim]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description

Configure PIM tracing options.

To specify more than one tracing operation, include multiple **flag** statements.

Default

The default PIM trace options are those inherited from the routing protocol's **traceoptions** statement included at the **[edit routing-options]** hierarchy level.

Options

disable—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as **all**.

file *filename*—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**. We recommend that you place tracing output in the **pim-log** file.

files *number*—(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed ***trace-file*.0**, then ***trace-file*.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you must also include the **size** statement to specify the maximum file size.

Range: 2 through 1000 files

Default: 2 files

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements.

PIM Tracing Flags

- **assert**—Assert messages
- **bidirectional-df-election**—Bidirectional PIM designated-forwarder (DF) election events

- **bootstrap**—Bootstrap messages
- **cache**—Packets in the PIM sparse mode routing cache
- **graft**—Graft and graft acknowledgment messages
- **hello**—Hello packets
- **join**—Join messages
- **mt**—Multicast tunnel messages
- **nsr-synchronization**—Nonstop active routing (NSR) synchronization messages
- **packets**—All PIM packets
- **prune**—Prune messages
- **register**—Register and register stop messages
- **rp**—Candidate RP advertisements
- **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**—Interface transactions and processing
- **timer**—Timer usage

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

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

no-stamp—(Optional) Do not place timestamp information at the beginning of each line in the trace file.

Default: If you omit this option, timestamp information is placed at the beginning of each line of the tracing output.

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

replace—(Optional) Replace an existing trace file if there is one.

Default: If you do not include this option, tracing output is appended to an existing trace 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 ***trace-file*** again reaches this 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 include the **files** statement to specify the maximum number of trace files.

Syntax: ***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify GB

Range: 0 KB through the maximum file size supported on your system

Default: 1 MB

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

Required Privilege Level

routing and trace—To view this statement in the configuration.
routing-control and trace-control—To add this statement to the configuration.

Related Documentation

- *Configuring PIM Trace Options*
- *Tracing DVMRP Protocol Traffic*
- *Tracing MSDP Protocol Traffic*
- *Configuring PIM Trace Options*

traceoptions (Protocols IGMP)

Syntax

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

Hierarchy Level

[edit logical-systems *logical-system-name* protocols igmp],
[edit protocols igmp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description

Configure IGMP tracing options.

To specify more than one tracing operation, include multiple **flag** statements.

To trace the paths of multicast packets, use the **mtrace** command.

Default

The default IGMP trace options are those inherited from the routing protocols **traceoptions** statement included at the **[edit routing-options]** hierarchy level.

Options

disable—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as **all**.

file *filename*—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**. We recommend that you place tracing output in the file **igmp-log**.

files *number*—(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed ***trace-file*.0**, then ***trace-file*.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you must also include the **size** statement to specify the maximum file size.

Range: 2 through 1000 files

Default: 2 files

flag—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements.

IGMP Tracing Flags

- **leave**—Leave group messages (for IGMP version 2 only).
- **mtrace**—Mtrace packets. Use the **mtrace** command to troubleshoot the software.
- **packets**—All IGMP packets.

- **query**—IGMP membership query messages, including general and group-specific queries.
- **report**—Membership report messages.

Global Tracing Flags

- **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**—Interface transactions and processing
- **timer**—Timer usage

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

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

no-stamp—(Optional) Do not place timestamp information at the beginning of each line in the trace file.

Default: If you omit this option, timestamp information is placed at the beginning of each line of the tracing output.

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

replace—(Optional) Replace an existing trace file if there is one.

Default: If you do not include this option, tracing output is appended to an existing trace 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 ***trace-file*** again reaches this 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 include the **files** statement to specify the maximum number of trace files.

Syntax: ***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify GB

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

Default: 1 MB

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

Required Privilege Level

routing and trace—To view this statement in the configuration.
routing-control and trace-control—To add this statement to the configuration.

Related Documentation

- *Tracing IGMP Protocol Traffic*

traceoptions (IGMP Snooping)

Syntax

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

Hierarchy Level [edit protocols igmp-snooping]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement introduced in Junos OS Release 13.2 for the QFX series.

Description Define tracing operations for IGMP snooping.

Default The **traceoptions** feature is disabled by default.

Options

file *filename*—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**.

files *number*—(Optional) Maximum number of trace files, including the active trace file. When a trace file reaches its maximum size, its contents are archived into a compressed file named ***filename*.0** and the trace file is emptied. When the trace file reaches its maximum size again, the ***filename*.0** archive file is renamed ***filename*.1** and a new ***filename*.0** archive file is created from the contents of the trace file. This process continues until the maximum number of trace files is reached, at which point the system starts overwriting the oldest archive file each time the trace file is archived. If you specify a maximum number of files, you also must specify a maximum file size with the **size** option.

Range: 2 through 1000

Default: 10 files

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:

- **all**—All tracing operations.
- **general**—Trace general IGMP snooping protocol events.
- **krt**—Trace communication over routing socket.
- **leave**—Trace leave group messages (IGMPv2 and IGMPv3 only).
- **nexthop**—Trace nexthop-related events.
- **normal**—Trace normal IGMP snooping protocol events. If you do not specify this flag, only unusual or abnormal operations are traced.
- **packets**—Trace all IGMP packets.
- **policy**—Trace policy processing.
- **query**—Trace IGMP membership query messages.

- **report**—Trace membership report messages.
- **route**—Trace routing information.
- **state**—Trace IGMP state transitions.
- **task**—Trace routing protocol task processing.
- **timer**—Trace routing protocol timer processing.
- **vlan**—Trace VLAN-related events.

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

- **detail**—Provide detailed trace information
- **disable**—Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as all.
- **receive**—Packets being received.
- **send**—Packets being transmitted.

no-stamp—(Optional) Omit the timestamp at the beginning of each line in the trace file.

no-world-readable—(Optional) Restrict file access to the user who created the file.

replace—(Optional) Replace an existing trace file if there is one. If you do not include this option, tracing output is appended to an existing trace file.

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

Syntax: ***x*** to specify bytes, ***x*****k** to specify KB, ***x*****m** to specify MB, or ***x*****g** to specify GB

Range: 10240 through 4294967295 bytes

Default: 128 KB

world-readable—(Optional) Allow unrestricted file access.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring IGMP Snooping Tracing Operations (CLI Procedure) on page 26

version (Protocols IGMP)

Syntax version *version*;

Hierarchy Level [edit logical-systems *logical-system-name* protocols igmp interface *interface-name*], [edit protocols igmp interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify the version of IGMP.

Options *version*—IGMP version number.

Range: 1, 2, or 3

Default: IGMP version 2

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Changing the IGMP Version*

version (IGMP Snooping)

Syntax version *number*;

Hierarchy Level [edit protocols igmp-snooping vlan (all | *vlan-name*)]

Release Information Statement introduced in Junos OS Release 11.1 for EX Series switches.
Statement introduced in Junos OS Release 12.1 for the QFX Series.

Description Specify the IGMP version for the IGMP general query that the switch sends to hosts when an interface comes up. The configured IGMP version affects only the version of the general queries sent by a switch. It does not affect the version of IGMP messages that the switch can snoop. For example, If the switch is configured for IGMP version 1 (IGMPv1), it can snoop IGMPv2 and IGMPv3 messages.

Default If you do not configure the **version** statement, the default is IGMPv2.

Options ***version***—IGMP version number.
Range: 1 and 2.

NOTE: IGMP v3 snooping is not supported.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring IGMP Snooping (CLI Procedure)*
- *Configuring IGMP Snooping*

version (PIM)

Syntax version *version*;

Hierarchy Level
[edit logical-systems *logical-system-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* protocols pim rp static address *address*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* protocols pim rp static address *address*],
[edit protocols pim interface *interface-name*],
[edit protocols pim rp static address *address*],
[edit routing-instances *routing-instance-name* protocols pim interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols pim rp static address *address*]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.3 for the QFX Series.

Description Specify the version of PIM.

Options ***version***—PIM version number.

Range: 1 or 2

Default: PIMv1 for rendezvous point (RP) mode (at the **[edit protocols pim rp static address *address*]** hierarchy level). PIMv2 for interface mode (at the **[edit protocols pim interface *interface-name*]** hierarchy level).

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Enabling PIM Sparse Mode*
- *Configuring PIM Dense Mode Properties*
- *Configuring PIM Sparse-Dense Mode Properties*

vlan (IGMP Snooping)

Syntax

```
vlan (all | vlan-name) {
  data-forwarding {
    source {
      groups group-prefix;
    }
    receiver {
      source-vlans vlan-list;
      install;
    }
  }
  disable;
  immediate-leave;
  interface (all | interface-name) {
    multicast-router-interface;
    static {
      group ip-address;
    }
  }
  proxy {
    source-address ip-address;
  }
  robust-count number;
  version version;
}
```

Hierarchy Level [edit protocols igmp-snooping]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement updated with enhanced **?** (CLI completion feature) functionality in Junos OS Release 9.5 for EX Series switches.

Description Configure IGMP snooping parameters for a VLAN.

When the **vlan** configuration statement is used without the **disable** statement, IGMP snooping is enabled on the specified VLAN or on all VLANs.

NOTE: You cannot configure IGMP snooping on a secondary VLAN.

Default If the **vlan** statement is not included in the configuration, IGMP snooping is disabled.

Options

- **all**—All VLANs on the switch
- ***vlan-name***—Name of a VLAN.

TIP: When you configure IGMP snooping parameters using the vlan all statement, any VLAN that is not individually configured for IGMP snooping

inherits the vlan all configuration. Any VLAN that is individually configured for IGMP snooping, on the other hand, inherits none of its configuration from vlan all. Any parameters that are not explicitly defined for the individual VLAN assume their default values, not the values specified in the vlan all configuration.

For example, in the following configuration:

```
protocols {
    igmp-snooping {
        vlan all {
            robust-count 8;
        }
        vlan employee {
            interface ge-0/0/8.0 {
                static {
                    group 239.0.10.3
                }
            }
        }
    }
}
```

all VLANs, except employee, have a robust count of 8. Because employee has been individually configured, its robust count value is not determined by the value set under vlan all. Instead, its robust count is the default value of 2.

The remaining statements are explained separately.

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*
- *show igmp-snooping vlans*

PART 3

Administration

CHAPTER 5

Routine Monitoring

Monitoring IGMP Snooping

Purpose

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

Use the monitoring feature to view status and information about IGMP snooping configuration on your EX Series switch.

Action

To display IGMP snooping details in the J-Web interface, select **Monitor** > **Switching** > **IGMP Snooping**.

To display IGMP snooping details in the CLI, enter the following commands:

- **show igmp-snooping route**
- **show igmp-snooping statistics**
- **show igmp-snooping vlans**

NOTE: On EX4300 switches, to display IGMP snooping details in the CLI, enter the following commands:

- **show igmp snooping interface**
- **show igmp snooping statistics**
- **show multicast snooping next-hops**
- **show multicast snooping route**

Meaning

Table 5 on page 116 summarizes the IGMP snooping details displayed.

Table 5: Summary of IGMP Snooping Output Fields

Field	Values
IGMP Snooping Monitor	
VLAN	The VLAN for which IGMP snooping is enabled.
Interfaces	Indicates the interfaces configured as switching interfaces that are associated with the multicast router.
Groups	Indicates the number of the multicast groups learned by the VLAN.
Learning Domain NOTE: This option is supported only on EX4300 switches.	Learning domain for snooping.
Query Interval NOTE: This option is supported only on EX4300 switches.	Frequency (in seconds) with which the router sends membership queries when it is the querier.
Query Response Interval NOTE: This option is supported only on EX4300 switches.	Time (in seconds) that the router waits for a response to a general query.
Last Member Query Interval NOTE: This option is supported only on EX4300 switches.	Time (in seconds) that the router waits for a report in response to a group-specific query.
Robustness Count NOTE: This option is supported only on EX4300 switches.	Number of times the router retries a query.
MRouters NOTE: This option is not supported on EX4300 switches.	Specifies the multicast router.
Receivers NOTE: This option is not supported on EX4300 switches.	Specifies the multicast receiver.
Interface Details	
Interfaces NOTE: This option is only supported on EX4300 switches.	Name of the interface.
State NOTE: This option is only supported on EX4300 switches.	Operating state of the interface. Values are Up or Down.
Group count NOTE: This option is only supported on EX4300 switches.	Number of groups on the interface.

Table 5: Summary of IGMP Snooping Output Fields *(continued)*

Field	Values
Immediate Leave NOTE: This option is only supported on EX4300 switches.	State of immediate leave. Values are On or Off.
Router Interface NOTE: This option is only supported on EX4300 switches.	Router interfaces that are part of this learning domain.
IGMP Route Information	
VLAN NOTE: This option is not supported on EX4300 switches.	The VLAN for which IGMP snooping is enabled.
Group NOTE: This option is not supported on EX4300 switches.	Indicates the multicast groups learned by the VLAN.
Next-Hop NOTE: This option is not supported on EX4300 switches.	Specifies the next hop assigned by the switch after performing the route lookup.
Statistics	
Packets per Vlan NOTE: This option is supported only on EX4300 switches.	Displays the number of packets sent or received, or the number of received errors.
Global NOTE: This option is supported only on EX4300 switches.	Displays the statistics name and statistics count. The statistics names are: • Bad Length • Bad Checksum • Bad Receive If • Rx non-local • Timed out
Multicast Snooping Nexthops	
ID NOTE: This option is supported only on EX4300 switches.	Next-hop identifier of the prefix. The identifier is returned by the routing device's Packet Forwarding Engine.
Reference Count NOTE: This option is supported only on EX4300 switches.	Number of cache entries that are using this next hop.
Kernel Reference Count NOTE: This option is supported only on EX4300 switches.	Kernel reference count for the next hop.

Table 5: Summary of IGMP Snooping Output Fields *(continued)*

Field	Values
Downstream Interface	Interface names associated with each multicast next-hop ID.

NOTE: This option is supported only on EX4300 switches.

Related Documentation

- show igmp-snooping route on page 167
- show igmp-snooping statistics on page 169
- *show igmp-snooping vlans*
- *Configuring IGMP Snooping (CLI Procedure)*
- *Example: Configuring IGMP Snooping on EX Series Switches*

Verifying IGMP Snooping (CLI Procedure)

Internet Group Management Protocol (IGMP) snooping constrains the flooding of IPv4 multicast traffic on VLANs on a switch. This topic describes how to verify IGMP snooping operation on the switch.

It covers:

Verifying IGMP Snooping Memberships

Purpose Determine group memberships, multicast-router interfaces, host IGMP versions, and the current values of timeout counters.

Action Enter the following command:

```
user@switch> show igmp-snooping membership detail
VLAN: vlan2 Tag: 2 (Index: 3)
    Router interfaces:
        ge-1/0/0.0 dynamic Uptime: 00:14:24 timeout: 253
    Group: 225.0.0.1
      ge-1/0/17.0 259 Last reporter: 13.0.0.90 Receiver count: 1
      Uptime: 00:00:19 timeout: 259 Flags: <V3-hosts>
        Include source: 10.2.11.5, 10.2.11.12
```

Meaning The switch has multicast membership information for one VLAN on the switch, **vlan2**. IGMP snooping might be enabled on other VLANs, but the switch does not have any multicast membership information for them. The following information is provided:

- Information on the multicast-router interfaces for the VLAN—in this case, **ge-1/0/0.0**. The multicast-router interface has been learned by IGMP snooping, as indicated by the dynamic value. The timeout value shows how many seconds from now the interface

will be removed from the multicast forwarding table if the switch does not receive IGMP queries or Protocol Independent Multicast (PIM) updates on the interface.

- Information about the group memberships for the VLAN:
  - Currently, the VLAN has membership in only one multicast group, **225.0.0.1**.
  - The host or hosts that have reported membership in the group are on interface **ge-1/0/17.0**. The last host that reported membership in the group has address **13.0.0.90**. The number of hosts belonging to the group on the interface is shown in the Receiver count field, which is displayed only when host tracking is enabled if immediate leave is configured on the VLAN.
  - The Uptime field shows that the multicast group has been active on the interface for 19 seconds. The interface group membership will time out in 259 seconds if no hosts respond to membership queries during this interval. The Flags field shows the lowest version of IGMP used by a host that is currently a member of the group, which in this case is IGMP version 3 (IGMPv3).
  - Because the interface has IGMPv3 hosts on it, the source addresses from which the IGMPv3 hosts want to receive group multicast traffic are shown (addresses **10.2.11.5** and **10.2.11.12**). The timeout value for the interface group membership is derived from the largest timeout value for all sources addresses for the group.

Viewing IGMP Snooping Statistics

Purpose Display IGMP snooping statistics, such as number of IGMP queries, reports, and leaves received and how many of these IGMP messages contained errors.

Action Enter the following command:

```
user@switch> show igmp-snooping statistics
Bad length: 0 Bad checksum: 0 Invalid interface: 0
Not local: 0 Receive unknown: 0 Timed out: 0

    IGMP Type           Received      Transmitted    Recv Errors
    Queries:               74295                0              0
    Reports:           18148423                0       16333523
    Leaves:                   0                0              0
    Other:                    0                0              0
```

Meaning The output shows how many IGMP messages of each type—**Queries**, **Reports**, **Leaves**—the switch received or transmitted on interfaces on which IGMP snooping is enabled. For each message type, it also shows the number of IGMP packets the switch received that had errors—for example, packets that do not conform to the IGMPv1, IGMPv2, or IGMPv3 standards. If the **Recv Errors** count increases, verify that the hosts are compliant with IGMP standards. If the switch is unable to recognize the IGMP message type for a packet, it counts the packet under **Receive unknown**.

Viewing IGMP Snooping Routing Information

Purpose Display the next-hop information maintained in the multicast forwarding table.

Action Enter the following command:

```
user@switch> show igmp-snooping route detail
VLAN             Group          Next-hop
v100             224.0.0.0, *       1323
        Interfaces: ge-0/0/0.0
VLAN             Group          Next-hop
v100             226.0.0.1, *       1322
        Interfaces: ge-0/0/0.0, ge-0/0/1.0, ge-0/0/47.0
```

Meaning The output shows the next-hop interfaces for a given multicast group on a VLAN. For example, route **226.0.0.1** on **v100** has next-hop interfaces **ge-0/0/0.0**, **ge-0/0/1.0**, and **ge-0/0/47.0**.

Related Documentation

- clear igmp-snooping membership on page 128
- clear igmp-snooping statistics on page 129
- *Example: Configuring IGMP Snooping on EX Series Switches*
- *Configuring IGMP Snooping (CLI Procedure)*

CHAPTER 6

Operational Commands

- clear igmp membership
- clear igmp statistics
- clear igmp-snooping membership
- clear igmp-snooping statistics
- clear multicast bandwidth-admission
- clear multicast scope
- clear multicast sessions
- clear multicast statistics
- clear pim join
- clear pim register
- clear pim statistics
- mtrace
- mtrace from-source
- mtrace monitor
- mtrace to-gateway
- show igmp group
- show igmp interface
- show igmp statistics
- show igmp-snooping membership
- show igmp-snooping route
- show igmp-snooping statistics
- show multicast flow-map
- show multicast interface
- show multicast mrinfo
- show multicast next-hops
- show multicast pim-to-igmp-proxy
- show multicast pim-to-mld-proxy
- show multicast route

- show multicast rpf
- show multicast scope
- show multicast sessions
- show multicast usage
- show pim bootstrap
- show pim interfaces
- show pim join
- show pim neighbors
- show pim rps
- show pim source
- show pim statistics

clear igmp membership

List of Syntax
Syntax on page 123
Syntax (EX Series Switch and the QFX Series) on page 123

Syntax

clear igmp membership
<group *address-range*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)

clear igmp membership
<group *address-range*>
<interface *interface-name*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Clear Internet Group Management Protocol (IGMP) group members.

Options

none—Clear all IGMP members on all interfaces and for all address ranges.

group *address-range*—(Optional) Clear all IGMP members that are in a particular address range. An example of a range is **224.2/16**. If you omit the destination prefix length, the default is **/32**.

interface *interface-name*—(Optional) Clear all IGMP group members on an interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level

clear

Related Documentation

- show igmp group on page 153
- show igmp interface on page 157

List of Sample Output

clear igmp membership on page 123
clear igmp membership interface on page 124
clear igmp membership group on page 125

Output Fields

See show igmp group for an explanation of output fields.

Sample Output

clear igmp membership

The following sample output displays IGMP group information before and after the **clear igmp membership** command is entered:

```
user@host> show igmp group
```

```
Interface        Group           Last Reported   Timeout
so-0/0/0         224.2.127.253   10.1.128.1          186
so-0/0/0         224.2.127.254   10.1.128.1          186
so-0/0/0         239.255.255.255 10.1.128.1          187
so-0/0/0         224.1.127.255   10.1.128.1          188
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0

user@host> clear igmp membership
Clearing Group Membership Info for so-0/0/0
Clearing Group Membership Info for so-1/0/0
Clearing Group Membership Info for so-2/0/0

user@host> show igmp group
Interface        Group           Last Reported   Timeout
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0
```

clear igmp membership interface

The following sample output displays IGMP group information before and after the **clear igmp membership interface** command is issued:

```
user@host> show igmp group
Interface        Group           Last Reported   Timeout
so-0/0/0         224.2.127.253   10.1.128.1          210
so-0/0/0         239.255.255.255 10.1.128.1          210
so-0/0/0         224.1.127.255   10.1.128.1          215
so-0/0/0         224.2.127.254   10.1.128.1          216
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0

user@host> clear igmp membership interface so-0/0/0
Clearing Group Membership Info for so-0/0/0

user@host> show igmp group
Interface        Group           Last Reported   Timeout
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0
```

clear igmp membership group

The following sample output displays IGMP group information before and after the **clear igmp membership group** command is entered:

```
user@host> show igmp group
Interface        Group           Last Reported   Timeout
so-0/0/0         224.2.127.253   10.1.128.1          210
so-0/0/0         239.255.255.255 10.1.128.1          210
so-0/0/0         224.1.127.255   10.1.128.1          215
so-0/0/0         224.2.127.254   10.1.128.1          216
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0

user@host> clear igmp membership group 239.225/16
Clearing Group Membership Range 239.225.0.0/16 on so-0/0/0
Clearing Group Membership Range 239.225.0.0/16 on so-1/0/0
Clearing Group Membership Range 239.225.0.0/16 on so-2/0/0

user@host> show igmp group
Interface        Group           Last Reported   Timeout
so-0/0/0         224.1.127.255   10.1.128.1          231
so-0/0/0         224.2.127.254   10.1.128.1          233
so-0/0/0         224.2.127.253   10.1.128.1          236
local            224.0.0.6       (null)                0
local            224.0.0.5       (null)                0
local            224.2.127.254   (null)                0
local            239.255.255.255 (null)                0
local            224.0.0.2       (null)                0
local            224.0.0.13      (null)                0
```

clear igmp statistics

List of Syntax
Syntax on page 126
Syntax (EX Series Switches) on page 126

Syntax
clear igmp statistics
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches)
clear igmp statistics
<interface *interface-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Clear Internet Group Management Protocol (IGMP) statistics.

Options
none—Clear IGMP statistics on all interfaces.

interface *interface-name*—(Optional) Clear IGMP statistics for the specified interface only.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
clear

Related Documentation
- show igmp statistics on page 161

List of Sample Output
clear igmp statistics on page 126

Output Fields
See show igmp statistics for an explanation of output fields.

Sample Output

clear igmp statistics

The following sample output displays IGMP statistics information before and after the **clear igmp statistics** command is entered:

```
user@host> show igmp statistics
IGMP packet statistics for all interfaces
IGMP Message type      Received       Sent  Rx errors
Membership Query           8883        459          0
V1 Membership Report          0          0          0
DVMRP                     19784      35476          0
PIM V1                    18310          0          0
Cisco Trace                   0          0          0
V2 Membership Report          0          0          0
Group Leave                   0          0          0
Mtrace Response               0          0          0
```

```
Mtrace Request                0          0          0
Domain Wide Report            0          0          0
V3 Membership Report          0          0          0
Other Unknown types                                  0
IGMP v3 unsupported type                             0
IGMP v3 source required for SSM                      0
IGMP v3 mode not applicable for SSM                  0

IGMP Global Statistics
Bad Length                    0
Bad Checksum                  0
Bad Receive If                0
Rx non-local               1227
```

```
user@host> clear igmp statistics
user@host> show igmp statistics
IGMP packet statistics for all interfaces
IGMP Message type      Received       Sent  Rx errors
Membership Query              0          0          0
V1 Membership Report          0          0          0
DVMRP                         0          0          0
PIM V1                        0          0          0
Cisco Trace                   0          0          0
V2 Membership Report          0          0          0
Group Leave                   0          0          0
Mtrace Response               0          0          0
Mtrace Request                0          0          0
Domain Wide Report            0          0          0
V3 Membership Report          0          0          0
Other Unknown types                                  0
IGMP v3 unsupported type                             0
IGMP v3 source required for SSM                      0
IGMP v3 mode not applicable for SSM                  0
IGMP Global Statistics
Bad Length                    0
Bad Checksum                  0
Bad Receive If                0
Rx non-local                  0
```

clear igmp-snooping membership

Syntax **clear igmp-snooping membership**
<vlan *vlan-name*>

Release Information Command introduced in Junos OS Release 9.1 for EX Series switches.

Description Clear IGMP snooping dynamic membership information from the multicast forwarding table.

Options **none**—Clear dynamic membership information for all VLANs.

vlan *vlan-name* —(Optional) Clear dynamic membership information for the specified VLAN.

Required Privilege Level view

Related Documentation
- show igmp-snooping membership on page 164
- clear igmp-snooping statistics on page 129

List of Sample Output clear igmp-snooping membership on page 128

Sample Output

clear igmp-snooping membership

```
user@switch> clear igmp-snooping membership vlan employee-vlan
```

clear igmp-snooping statistics

Syntax **clear igmp-snooping statistics**

Release Information Command introduced in Junos OS Release 9.1 for EX Series switches.

Description Clear IGMP snooping statistics.

Required Privilege Level view

Related Documentation
- show igmp-snooping statistics on page 169
- clear igmp-snooping membership on page 128

List of Sample Output clear igmp-snooping statistics on page 129

Sample Output

clear igmp-snooping statistics

```
user@switch> clear igmp-snooping statistics
```

clear multicast bandwidth-admission

Syntax

clear multicast bandwidth-admission
<group *group-address*>
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<source *source-address*>

Release Information

Command introduced in Junos OS Release 8.3.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Reapply IP multicast bandwidth admissions.

Options

none—Reapply multicast bandwidth admissions for all IPv4 forwarding entries in the master routing instance.

group ***group-address***—(Optional) Reapply multicast bandwidth admissions for the specified group.

inet—(Optional) Reapply multicast bandwidth admission settings for IPv4 flows.

inet6—(Optional) Reapply multicast bandwidth admission settings for IPv6 flows.

instance ***instance-name***—(Optional) Reapply multicast bandwidth admission settings for the specified instance. If you do not specify an instance, the command applies to the master routing instance.

interface ***interface-name***—(Optional) Examines the corresponding outbound interface in the relevant entries and acts as follows:

- If the interface is congested, and it was admitted previously, it is removed.
- If the interface was rejected previously, the **clear multicast bandwidth-admission** command enables the interface to be admitted as long as enough bandwidth exists on the interface.
- If you do not specify an interface, issuing the **clear multicast bandwidth-admission** command readmits any previously rejected interface for the relevant entries as long as enough bandwidth exists on the interface.

To manually reject previously admitted outbound interfaces, you must specify the interface.

source ***source-address***—(Optional) Use with the **group** option to reapply multicast bandwidth admission settings for the specified (source, group) entry.

Required Privilege Level

clear

Related Documentation
- show multicast interface on page 173

List of Sample Output clear multicast bandwidth-admission on page 131

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

Sample Output

clear multicast bandwidth-admission

```
user@host> clear multicast bandwidth-admission
```

clear multicast scope

List of Syntax
Syntax on page 132
Syntax (EX Series Switch and the QFX Series) on page 132

Syntax
clear multicast scope
<inet | inet6>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
clear multicast scope
<inet | inet6>
<interface *interface-name*>

Release Information
Command introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 option introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Clear IP multicast scope statistics.

Options
none—(Same as **logical-system all**) Clear multicast scope statistics.

inet—(Optional) Clear multicast scope statistics for IPv4 family addresses.

inet6—(Optional) Clear multicast scope statistics for IPv6 family addresses.

interface *interface-name*—(Optional) Clear multicast scope statistics on a specific interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
clear

Related Documentation
- show multicast scope on page 195

List of Sample Output
clear multicast scope on page 132

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

Sample Output

clear multicast scope

```
user@host> clear multicast scope
```

clear multicast sessions

List of Syntax
Syntax on page 133
Syntax (EX Series Switch and the QFX Series) on page 133

Syntax
clear multicast sessions
<logical-system (all | *logical-system-name*)>
<*regular-expression*>

Syntax (EX Series Switch and the QFX Series)
clear multicast sessions
<*regular-expression*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Clear IP multicast sessions.

Options
none—(Same as **logical-system all**) Clear multicast sessions.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

regular-expression—(Optional) Clear only multicast sessions that contain the specified regular expression.

Required Privilege Level
clear

Related Documentation
- show multicast sessions on page 197

List of Sample Output
clear multicast sessions on page 133

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

Sample Output

clear multicast sessions

```
user@host> clear multicast sessions
```

clear multicast statistics

List of Syntax
Syntax on page 134
Syntax (EX Series Switch and the QFX Series) on page 134

Syntax
clear multicast statistics
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
clear multicast statistics
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Clear IP multicast statistics.

Options
none—Clear multicast statistics for all supported address families on all interfaces.

inet—(Optional) Clear multicast statistics for IPv4 family addresses.

inet6—(Optional) Clear multicast statistics for IPv6 family addresses.

instance *instance-name*—(Optional) Clear multicast statistics for the specified instance.

interface *interface-name*—(Optional) Clear multicast statistics on a specific interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
clear

Related Documentation
- *show multicast statistics*

List of Sample Output
clear multicast statistics on page 134

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

Sample Output

clear multicast statistics

```
user@host> clear multicast statistics
```

clear pim join

List of Syntax
Syntax on page 135
Syntax (EX Series Switch and the QFX Series) on page 135

Syntax

clear pim join
<*group-address*>
<bidirectional | dense | sparse>
<exact>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<rp *ip-address/prefix* | source *ip-address/prefix*>
<sg | star-g>

Syntax (EX Series Switch and the QFX Series)

clear pim join
<*group-address*>
<dense | sparse>
<exact>
<inet | inet6>
<instance *instance-name*>
<rp *ip-address/prefix* | source *ip-address/prefix*>
<sg | star-g>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Multiple new filter options introduced in Junos OS Release 13.2.

Description

Clear the Protocol Independent Multicast (PIM) join and prune states.

Options

none—Clear the PIM join and prune states for all groups, family addresses, and instances.

group-address—(Optional) Clear the PIM join and prune states for a group address.

bidirectional | dense | sparse—(Optional) Clear PIM bidirectional mode, dense mode, or sparse and source-specific multicast (SSM) mode entries.

exact—(Optional) Clear only the group that exactly matches the specified group address.

inet | inet6—(Optional) Clear the PIM entries for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Clear the entries for a specific PIM-enabled routing instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

rp *ip-address/prefix* | source *ip-address/prefix*—(Optional) Clear the PIM entries with a specified rendezvous point (RP) address and prefix or with a specified source address and prefix. You can omit the prefix.

sg | star-g—(Optional) Clear PIM (S,G) or (*,G) entries.

Additional Information The **clear pim join** command cannot be used to clear the PIM join and prune state on a backup Routing Engine when nonstop active routing is enabled.

Required Privilege Level clear

Related Documentation
- show pim join on page 208

List of Sample Output
clear pim join on page 136
clear pim join inet6 on page 136
clear pim join inet6 star-g on page 136

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

Sample Output

clear pim join

```
user@host> clear pim join
Cleared 8 Join/Prune states
```

clear pim join inet6

```
user@host> clear pim join inet6
Cleared 4 Join/Prune states
```

clear pim join inet6 star-g

```
user@host> clear pim join inet6 star-g
Cleared 1 Join/Prune states
```

clear pim register

List of Syntax

Syntax on page 137
Syntax (EX Series Switch and the QFX Series) on page 137
Syntax (PTX Series) on page 137

Syntax

clear pim register
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)

clear pim register
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>

Syntax (PTX Series)

clear pim register
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Release Information

Command introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Clear Protocol Independent Multicast (PIM) register message counters.

Options

none—Clear PIM register message counters for all family addresses, instances, and interfaces.

inet | inet6—(Optional) Clear PIM register message counters for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Clear register message counters for a specific PIM-enabled routing instance.

interface *interface-name*—(Optional) Clear PIM register message counters for a specific interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Additional Information

The **clear pim register** command cannot be used to clear the PIM register state on a backup Routing Engine when nonstop active routing is enabled.

Required Privilege Level

clear

Related Documentation
- show pim statistics on page 244

List of Sample Output clear pim register on page 138

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

Sample Output

clear pim register

```
user@host> clear pim register
```

clear pim statistics

List of Syntax
Syntax on page 139
Syntax (EX Series Switch and the QFX Series) on page 139

Syntax

clear pim statistics
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)

clear pim statistics
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Clear Protocol Independent Multicast (PIM) statistics.

Options

none—Clear PIM statistics for all family addresses, instances, and interfaces.

inet | inet6—(Optional) Clear PIM statistics for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Clear statistics for a specific PIM-enabled routing instance.

interface *interface-name*—(Optional) Clear PIM statistics for a specific interface.

logical-system (all | *logical-system-name)*—(Optional) Perform this operation on all logical systems or on a particular logical system.

Additional Information

The **clear pim statistics** command cannot be used to clear the PIM statistics on a backup Routing Engine when nonstop active routing is enabled.

Required Privilege Level

clear

Related Documentation

- show pim statistics on page 244

List of Sample Output

clear pim statistics on page 140

Output Fields

See show pim statistics for an explanation of output fields.

Sample Output

clear pim statistics

The following sample output displays PIM statistics before and after the **clear pim statistics** command is entered:

```
user@host> show pim statistics
PIM statistics on all interfaces:
PIM Message type       Received       Sent  Rx errors
Hello                         0          0          0
Register                      0          0          0
Register Stop                 0          0          0
Join Prune                    0          0          0
Bootstrap                     0          0          0
Assert                        0          0          0
Graft                         0          0          0
Graft Ack                     0          0          0
Candidate RP                  0          0          0
V1 Query                   2111       4222          0
V1 Register                   0          0          0
V1 Register Stop              0          0          0
V1 Join Prune             14200      13115          0
V1 RP Reachability            0          0          0
V1 Assert                     0          0          0
V1 Graft                      0          0          0
V1 Graft Ack                  0          0          0
PIM statistics summary for all interfaces:
Unknown type                              0
V1 Unknown type                           0
Unknown Version                           0
Neighbor unknown                          0
Bad Length                                0
Bad Checksum                              0
Bad Receive If                            0
Rx Intf disabled                       2007
Rx V1 Require V2                          0
Rx Register not RP                        0
RP Filtered Source                        0
Unknown Reg Stop                          0
Rx Join/Prune no state                 1040
Rx Graft/Graft Ack no state               0
...

user@host> clear pim statistics
user@host> show pim statistics
PIM statistics on all interfaces:
PIM Message type       Received       Sent  Rx errors
Hello                         0          0          0
Register                      0          0          0
Register Stop                 0          0          0
Join Prune                    0          0          0
Bootstrap                     0          0          0
Assert                        0          0          0
Graft                         0          0          0
Graft Ack                     0          0          0
Candidate RP                  0          0          0
V1 Query                      1          0          0
V1 Register                   0          0          0
...
```

mtrace

Syntax

mtrace *source*
<logical-system *logical-system-name*>
<routing-instance *routing-instance-name*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 9.5 for SRX1400, SRX3400, SRX3600, SRX5600, and SRX5800 devices.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Command introduced in Junos OS Release 12.3 for the PTX Series.

Description

Display trace information about an IP multicast path.

Options

source—Source hostname or address.

logical-system (*logical-system-name*)—(Optional) Perform this operation on a logical system.

routing-instance *routing-instance-name*—(Optional) Trace a particular routing instance.

Additional Information

The **mtrace** command for multicast traffic is similar to the **traceroute** command used for unicast traffic. Unlike **traceroute**, **mtrace** traces traffic backwards, from the receiver to the source.

Required Privilege Level

view

List of Sample Output

mtrace source on page 144

Output Fields

Table 6 on page 142 describes the output fields for the **mtrace** command. Output fields are listed in the approximate order in which they appear.

Table 6: mtrace Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
number-of-hops	Number of hops from the source to the named router or switch.
router-name	Name of the router or switch for this hop.
address	Address of the router or switch for this hop.

Table 6: mtrace Output Fields *(continued)*

Field Name	Field Description
protocol	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.

Sample Output

mtrace source

```
user@host> mtrace 192.1.4.2
Mtrace from 192.1.4.2 to 192.1.1.2 via group 0.0.0.0
Querying full reverse path... * *
  0  routerA.lab.mycompany.net (192.1.1.2)
 -1  routerB.lab.mycompany.net (192.1.2.2)  PIM  thresh^ 1
 -2  routerC.lab.mycompany.net (192.1.3.2)  PIM  thresh^ 1
 -3  hostA.lab.mycompany.net (192.1.4.2)
Round trip time 2 ms; total ttl of 2 required.
```

mtrace from-source

Syntax

mtrace from-source source *source*
<brief | detail>
<extra-hops *extra-hops*>
<group *group*>
<interval *interval*>
<loop>
<max-hops *max-hops*>
<max-queries *max-queries*>
<multicast-response | unicast-response>
<no-resolve>
<no-router-alert>
<response *response*>
<routing-instance *routing-instance-name*>
<ttl *ttl*>
<wait-time *wait-time*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Display trace information about an IP multicast path from a source to this router or switch. If you specify a group address with this command, Junos OS returns additional information, such as packet rates and losses.

Options

brief | detail—(Optional) Display the specified level of output.

extra-hops *extra-hops*—(Optional) Number of hops to take after reaching a nonresponsive router. You can specify a number between **0** and **255**.

group *group*—(Optional) Group address for which to trace the path. The default group address is **0.0.0.0**.

interval *interval*—(Optional) Number of seconds to wait before gathering statistics again. The default value is **10** seconds.

loop—(Optional) Loop indefinitely, displaying rate and loss statistics.

max-hops *max-hops*—(Optional) Maximum hops to trace toward the source. The range of values is **0** through **255**. The default value is **32** hops.

max-queries *max-queries*—(Optional) Maximum number of query attempts for any hop. The range of values is **1** through **32**. The default is **3**.

multicast-response—(Optional) Always request the response using multicast.

no-resolve—(Optional) Do not attempt to display addresses symbolically.

no-router-alert—(Optional) Do not use the router-alert IP option.

response *response*—(Optional) Send trace response to a host or multicast address.

routing-instance ***routing-instance-name***—(Optional) Trace a particular routing instance.

source ***source***—Source hostname or address.

ttl ***ttl***—(Optional) IP time-to-live (TTL) value. You can specify a number between **0** and **255**. Local queries to the multicast group use a value of **1**. Otherwise, the default value is **127**.

unicast-response—(Optional) Always request the response using unicast.

wait-time ***wait-time***—(Optional) Number of seconds to wait for a response. The default value is **3**.

Required Privilege Level view

List of Sample Output mtrace from-source on page 147

Output Fields Table 7 on page 146 describes the output fields for the **mtrace from-source** command. Output fields are listed in the approximate order in which they appear.

Table 7: mtrace from-source Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
number-of-hops	Number of hops from the source to the named router or switch.
router-name	Name of the router or switch for this hop.
address	Address of the router or switch for this hop.
protocol	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.
source	Source address.
Response Dest	Response destination address.
Overall	Average packet rate for all traffic at each hop.

Table 7: mtrace from-source Output Fields *(continued)*

Field Name	Field Description
Packet Statistics for Traffic From	Number of packets lost, number of packets sent, percentage of packets lost, and average packet rate at each hop.
Receiver	IP address receiving the multicast.
Query source	IP address sending the mtrace query.

Sample Output

mtrace from-source

```
user@host> mtrace from-source source 192.1.4.2 group 225.1.1.1
Mtrace from 192.1.4.2 to 192.1.1.2 via group 225.1.1.1
Querying full reverse path... * *
  0  routerA.lab.mycompany.net (192.1.1.2)
 -1  routerB.lab.mycompany.net (192.1.2.2)  PIM  thresh^ 1
 -2  routerC.lab.mycompany.net (192.1.3.2)  PIM  thresh^ 1
 -3  hostA.lab.mycompany.net (192.1.4.2)
Round trip time 2 ms; total ttl of 2 required.

Waiting to accumulate statistics...Results after 10 seconds:

Source        Response Dest    Overall     Packet Statistics For Traffic From
192.1.4.2 192.1.1.2    Packet      192.1.4.2 To 225.1.1.1
     v       __/  rtt    2 ms     Rate       Lost/Sent = Pct  Rate
192.1.2.1
192.1.3.2  routerC.lab.mycompany.net
     v     ^      ttl    2                     0/0    = --    0 pps
192.1.4.1
192.1.2.2   routerB.lab.mycompany.net
     v      \__   ttl    3                     ?/0            0 pps
192.1.1.2   192.1.1.2
  Receiver      Query Source
```

mtrace monitor

Syntax mtrace monitor

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description Listen passively for IP multicast responses. To exit the **mtrace monitor** command, type Ctrl+c.

Options **none**—Trace the master instance.

Required Privilege Level view

List of Sample Output mtrace monitor on page 149

Output Fields Table 8 on page 148 describes the output fields for the **mtrace monitor** command. Output fields are listed in the approximate order in which they appear.

Table 8: mtrace monitor Output Fields

Field Name	Field Description
Mtrace query at	Date and time of the query.
by	Address of the host issuing the query.
resp to	Response destination.
qid	Query ID number.
packet from...to	IP address of the query source and default group destination.
from...to	IP address of the multicast source and the response address.
via group	IP address of the group to trace.
mxhop	Maximum hop setting.

Sample Output

mtrace monitor

```
user@host> mtrace monitor
Mtrace query at Oct 22 13:36:14 by 192.1.3.2, resp to 224.0.1.32, qid 74a5b8
packet from 192.1.3.2 to 224.0.0.2
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)

Mtrace query at Oct 22 13:36:17 by 192.1.3.2, resp to 224.0.1.32, qid 1d07ba
packet from 192.1.3.2 to 224.0.0.2
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)

Mtrace query at Oct 22 13:36:20 by 192.1.3.2, resp to same, qid 2fea1d
packet from 192.1.3.2 to 224.0.0.2
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)

Mtrace query at Oct 22 13:36:30 by 192.1.3.2, resp to same, qid 7c88ad
packet from 192.1.3.2 to 224.0.0.2
from 192.1.3.2 to 192.1.3.38 via group 224.1.1.1 (mxhop=60)
```

mtrace to-gateway

Syntax

mtrace to-gateway gateway *gateway*
<brief | detail>
<extra-hops *extra-hops*>
<group *group*>
<interface *interface-name*>
<interval *interval*>
<loop>
<max-hops *max-hops*>
<max-queries *max-queries*>
<multicast-response | unicast-response>
<no-resolve>
<no-router-alert>
<response *response*>
<routing-instance *routing-instance-name*>
<ttl *ttl*>
<unicast-response>
<wait-time *wait-time*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Display trace information about a multicast path from this router or switch to a gateway router or switch.

Options

gateway *gateway*—Send the trace query to a gateway multicast address.

brief | detail—(Optional) Display the specified level of output.

extra-hops *extra-hops*—(Optional) Number of hops to take after reaching a nonresponsive router or switch. You can specify a number between **0** and **255**.

group *group*—(Optional) Group address for which to trace the path. The default group address is **0.0.0.0**.

interface *interface-name*—(Optional) Source address for sending the trace query.

interval *interval*—(Optional) Number of seconds to wait before gathering statistics again. The default value is **10**.

loop—(Optional) Loop indefinitely, displaying rate and loss statistics.

max-hops *max-hops*—(Optional) Maximum hops to trace toward the source. You can specify a number between **0** and **255**.. The default value is **32**.

max-queries *max-queries*—(Optional) Maximum number of query attempts for any hop. You can specify a number between **0** and **255**. The default value is **3**.

multicast-response—(Optional) Always request the response using multicast.

no-resolve—(Optional) Do not attempt to display addresses symbolically.

no-router-alert—(Optional) Do not use the router-alert IP option.

response ***response***—(Optional) Send trace response to a host or multicast address.

routing-instance ***routing-instance-name***—(Optional) Trace a particular routing instance.

ttl ***ttl***—(Optional) IP time-to-live value. You can specify a number between **0** and **225**. Local queries to the multicast group use TTL **1**. Otherwise, the default value is **127**.

unicast-response—(Optional) Always request the response using unicast.

wait-time ***wait-time***—(Optional) Number of seconds to wait for a response. The default value is **3**.

Required Privilege Level view

List of Sample Output mtrace to-gateway on page 151

Output Fields Table 9 on page 151 describes the output fields for the **mtrace to-gateway** command. Output fields are listed in the approximate order in which they appear.

Table 9: mtrace to-gateway Output Fields

Field Name	Field Description
Mtrace from	IP address of the receiver.
to	IP address of the source.
via group	IP address of the multicast group (if any).
Querying full reverse path	Indicates the full reverse path query has begun.
number-of-hops	Number of hops from the source to the named router or switch.
router-name	Name of the router or switch for this hop.
address	Address of the router or switch for this hop.
protocol	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.

Sample Output

mtrace to-gateway

```
user@host> mtrace to-gateway gateway 192.1.3.2 group 225.1.1.1 interface 192.1.1.73 brief

Mtrace from 192.1.1.73 to 192.1.1.2 via group 225.1.1.1
```

```
Querying full reverse path... * *
  0  routerA.lab.mycompany.net (192.1.1.2)
 -1  routerA.lab.mycompany.net (192.1.1.2)  PIM  thresh^ 1
 -2  routerB.lab.mycompany.net (192.1.2.2)  PIM  thresh^ 1
 -3  routerC.lab.mycompany.net (192.1.3.2)  PIM  thresh^ 1
Round trip time 2 ms; total ttl of 3 required.
```

show igmp group

List of Syntax
Syntax on page 153
Syntax (EX Series Switch and the QFX Series) on page 153

Syntax
show igmp group
<brief | detail>
<*group-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show igmp group
<brief | detail>
<*group-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display Internet Group Management Protocol (IGMP) group membership information.

Options
none—Display standard information about membership for all IGMP groups.

brief | detail—(Optional) Display the specified level of output.

group-name—(Optional) Display group membership for the specified IP address only.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

Related Documentation
- clear igmp membership on page 123

List of Sample Output
show igmp group (Include Mode) on page 154
show igmp group (Exclude Mode) on page 155
show igmp group brief on page 155
show igmp group detail on page 155

Output Fields
Table 10 on page 153 describes the output fields for the **show igmp group** command. Output fields are listed in the approximate order in which they appear.

Table 10: show igmp group Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface that received the IGMP membership report. A name of **local** indicates that the local routing device joined the group itself.	All levels
Group	Group address.	All levels
Group Mode	Mode the SSM group is operating in: **Include** or **Exclude**.	All levels

Table 10: show igmp group Output Fields *(continued)*

Field Name	Field Description	Level of Output
Source	Source address.	All levels
Source timeout	Time remaining until the group traffic is no longer forwarded. The timer is refreshed when a listener in include mode sends a report. A group in exclude mode or configured as a static group displays a zero timer.	**detail**
Last reported by	Address of the host that last reported membership in this group.	All levels
Timeout	Time remaining until the group membership is removed.	**brief none**
Group timeout	Time remaining until a group in exclude mode moves to include mode. The timer is refreshed when a listener in exclude mode sends a report. A group in include mode or configured as a static group displays a zero timer.	**detail**
Type	Type of group membership: • **Dynamic**—Host reported the membership. • **Static**—Membership is configured.	All levels

Sample Output

show igmp group (Include Mode)

```
user@host> show igmp group
Interface: t1-0/1/0.0
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.2
        Last reported by: 10.9.5.2
        Timeout:      24 Type: Dynamic
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.3
        Last reported by: 10.9.5.2
        Timeout:      24 Type: Dynamic
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.4
        Last reported by: 10.9.5.2
        Timeout:      24 Type: Dynamic
    Group: 232.1.1.2
        Group mode: Include
        Source: 10.0.0.4
        Last reported by: 10.9.5.2
        Timeout:      24 Type: Dynamic
Interface: t1-0/1/1.0
Interface: ge-0/2/2.0
Interface: ge-0/2/0.0
Interface: local
    Group: 224.0.0.2
        Source: 0.0.0.0
        Last reported by: Local
        Timeout:       0 Type: Dynamic
```

```
    Group: 224.0.0.22
        Source: 0.0.0.0
        Last reported by: Local
        Timeout:       0 Type: Dynamic
```

show igmp group (Exclude Mode)

```
user@host> show igmp group
Interface: t1-0/1/0.0
Interface: t1-0/1/1.0
Interface: ge-0/2/2.0
Interface: ge-0/2/0.0
Interface: local
    Group: 224.0.0.2
        Source: 0.0.0.0
        Last reported by: Local
        Timeout:       0 Type: Dynamic
    Group: 224.0.0.22
        Source: 0.0.0.0
        Last reported by: Local
        Timeout:       0 Type: Dynamic
```

show igmp group brief

The output for the **show igmp group brief** command is identical to that for the **show igmp group** command.

show igmp group detail

```
user@host> show igmp group detail
Interface: t1-0/1/0.0
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.2
        Source timeout: 12
        Last reported by: 10.9.5.2
        Group timeout:       0 Type: Dynamic
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.3
        Source timeout: 12
        Last reported by: 10.9.5.2
        Group timeout:       0 Type: Dynamic
    Group: 232.1.1.1
        Group mode: Include
        Source: 10.0.0.4
        Source timeout: 12
        Last reported by: 10.9.5.2
        Group timeout:       0 Type: Dynamic
    Group: 232.1.1.2
        Group mode: Include
        Source: 10.0.0.4
        Source timeout: 12
        Last reported by: 10.9.5.2
        Group timeout:       0 Type: Dynamic
Interface: t1-0/1/1.0
Interface: ge-0/2/2.0
Interface: ge-0/2/0.0
Interface: local
    Group: 224.0.0.2
        Group mode: Exclude
```

```
    Source: 0.0.0.0
    Source timeout: 0
    Last reported by: Local
    Group timeout:       0 Type: Dynamic
Group: 224.0.0.22
    Group mode: Exclude
    Source: 0.0.0.0
    Source timeout: 0
    Last reported by: Local
    Group timeout:       0 Type: Dynamic
```

show igmp interface

List of Syntax
Syntax on page 157
Syntax (EX Series Switches and the QFX Series) on page 157

Syntax
show igmp interface
<brief | detail>
<*interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switches and the QFX Series)
show igmp interface
<brief | detail>
<*interface-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display information about Internet Group Management Protocol (IGMP)-enabled interfaces.

Options
none—Display standard information about all IGMP-enabled interfaces.

brief | detail—(Optional) Display the specified level of output.

interface-name—(Optional) Display information about the specified IGMP-enabled interface only.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

Related Documentation
- clear igmp membership on page 123

List of Sample Output
show igmp interface on page 159
show igmp interface brief on page 160
show igmp interface detail on page 160
show igmp interface <interface-name> on page 160

Output Fields
Table 11 on page 157 describes the output fields for the **show igmp interface** command. Output fields are listed in the approximate order in which they appear.

Table 11: show igmp interface Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface.	All levels
Querier	Address of the routing device that has been elected to send membership queries.	All levels

Table 11: show igmp interface Output Fields *(continued)*

Field Name	Field Description	Level of Output
State	State of the interface: **Up** or **Down**.	All levels
SSM Map Policy	Name of the source-specific multicast (SSM) map policy that has been applied to the IGMP interface.	All levels
Timeout	How long until the IGMP querier is declared to be unreachable, in seconds.	All levels
Version	IGMP version being used on the interface: **1** , **2** , or **3**.	All levels
Groups	Number of groups on the interface.	All levels
Group limit	Maximum number of groups allowed on the interface. Any joins requested after the limit is reached are rejected.	All levels
Group threshold	Configured threshold at which a warning message is generated. This threshold is based on a percentage of groups received on the interface. If the number of groups received reaches the configured threshold, the device generates a warning message.	All levels
Group log-interval	Time (in seconds) between consecutive log messages.	All levels
Immediate Leave	State of the immediate leave option: • **On**—Indicates that the router removes a host from the multicast group as soon as the router receives a leave group message from a host associated with the interface. • **Off**—Indicates that after receiving a leave group message, instead of removing a host from the multicast group immediately, the router sends a group query to determine if another receiver responds.	All levels
Promiscuous Mode	State of the promiscuous mode option: • **On**—Indicates that the router can accept IGMP reports from subnetworks that are not associated with its interfaces. • **Off**—Indicates that the router can accept IGMP reports only from subnetworks that are associated with its interfaces.	All levels
Passive	State of the passive mode option: • **On**—Indicates that the router can run IGMP on the interface but not send or receive control traffic such as IGMP reports, queries, and leaves. • **Off**—Indicates that the router can run IGMP on the interface and send or receive control traffic such as IGMP reports, queries, and leaves. The **passive** statement enables you to selectively activate up to two out of a possible three available query or control traffic options. When enabled, the following options appear after the **on** state declaration: • **send-general-query**—The interface sends general queries. • **send-group-query**—The interface sends group-specific and group-source-specific queries. • **allow-receive**—The interface receives control traffic.	All levels

Table 11: show igmp interface Output Fields *(continued)*

Field Name	Field Description	Level of Output
OIF map	Name of the OIF map (if configured) associated with the interface.	All levels
SSM map	Name of the source-specific multicast (SSM) map (if configured) used on the interface.	All levels
Configured Parameters	Information configured by the user: • **IGMP Query Interval**—Interval (in seconds) at which this router sends membership queries when it is the querier. • **IGMP Query Response Interval**—Time (in seconds) that the router waits for a report in response to a general query. • **IGMP Last Member Query Interval**—Time (in seconds) that the router waits for a report in response to a group-specific query. • **IGMP Robustness Count**—Number of times the router retries a query.	All levels
Derived Parameters	Derived information: • **IGMP Membership Timeout**—Timeout period (in seconds) for group membership. If no report is received for these groups before the timeout expires, the group membership is removed. • **IGMP Other Querier Present Timeout**—Time (in seconds) that the router waits for the IGMP querier to send a query.	All levels

Sample Output

show igmp interface

```
user@host> show igmp interface
Interface: at-0/3/1.0
    Querier: 10.111.30.1
    State:         Up Timeout:    None Version:  2 Groups:      4
    SSM Map Policy: ssm-policy-A
Interface: so-1/0/0.0
    Querier: 10.111.10.1
    State:         Up Timeout:    None Version:  2 Groups:      2
    SSM Map Policy: ssm-policy-B
Interface: so-1/0/1.0
    Querier: 10.111.20.1
    State:         Up Timeout:    None Version:  2 Groups:      4
    SSM Map Policy: ssm-policy-C
Immediate Leave: On
Promiscuous Mode: Off

Configured Parameters:
IGMP Query Interval: 125.0
IGMP Query Response Interval: 10.0
IGMP Last Member Query Interval: 1.0
IGMP Robustness Count: 2

Derived Parameters:
IGMP Membership Timeout: 260.0
IGMP Other Querier Present Timeout: 255.0
```

show igmp interface brief

The output for the **show igmp interface brief** command is identical to that for the **show igmp interface** command. For sample output, see show igmp interface on page 159.

show igmp interface detail

The output for the **show igmp interface detail** command is identical to that for the **show igmp interface** command. For sample output, see show igmp interface on page 159.

show igmp interface <interface-name>

```
user@host# show igmp interface ge-3/2/0.0
Interface: ge-3/2/0.0
  Querier: 20.1.1.1
  State: Up Timeout:    None Version:  3 Groups:      1
  Group limit: 8
  Group threshold: 60
  Group log-interval: 10
  Immediate leave:  Off
  Promiscuous mode:  Off
```

show igmp statistics

List of Syntax
Syntax on page 161
Syntax (EX Series Switch and the QFX Series) on page 161

Syntax
show igmp statistics
<brief | detail>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show igmp statistics
<brief | detail>
<interface *interface-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display Internet Group Management Protocol (IGMP) statistics.

Options
none—Display IGMP statistics for all interfaces.

brief | detail—(Optional) Display the specified level of output.

interface *interface-name*—(Optional) Display IGMP statistics about the specified interface only.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

Related Documentation
- clear igmp statistics on page 126

List of Sample Output
show igmp statistics on page 162
show igmp statistics interface on page 163

Output Fields
Table 12 on page 161 describes the output fields for the **show igmp statistics** command. Output fields are listed in the approximate order in which they appear.

Table 12: show igmp statistics Output Fields

Field Name	Field Description
IGMP packet statistics	Heading for IGMP packet statistics for all interfaces or for the specified interface name.

Table 12: show igmp statistics Output Fields *(continued)*

Field Name	Field Description
IGMP Message type	Summary of IGMP statistics: • **Membership Query**—Number of membership queries sent and received. • **V1 Membership Report**—Number of version 1 membership reports sent and received. • **DVMRP**—Number of DVMRP messages sent or received. • **PIM V1**—Number of PIM version 1 messages sent or received. • **Cisco Trace**—Number of Cisco trace messages sent or received. • **V2 Membership Report**—Number of version 2 membership reports sent or received. • **Group Leave**—Number of group leave messages sent or received. • **Mtrace Response**—Number of Mtrace response messages sent or received. • **Mtrace Request**—Number of Mtrace request messages sent or received. • **Domain Wide Report**—Number of domain-wide reports sent or received. • **V3 Membership Report**—Number of version 3 membership reports sent or received. • **Other Unknown types**—Number of unknown message types received. • **IGMP v3 unsupported type**—Number of messages received with unknown and unsupported IGMP version 3 message types. • **IGMP v3 source required for SSM**—Number of IGMP version 3 messages received that contained no source. • **IGMP v3 mode not applicable for SSM**—Number of IGMP version 3 messages received that did not contain a mode applicable for source-specific multicast (SSM).
Received	Number of messages received.
Sent	Number of messages sent.
Rx errors	Number of received packets that contained errors.
IGMP Global Statistics	Summary of IGMP statistics for all interfaces. • **Bad Length**—Number of messages received with length errors so severe that further classification could not occur. • **Bad Checksum**—Number of messages received with a bad IP checksum. No further classification was performed. • **Bad Receive If**—Number of messages received on an interface not enabled for IGMP. • **Rx non-local**—Number of messages received from senders that are not local. • **Timed out**—Number of groups that timed out as a result of not receiving an explicit leave message. • **Rejected Report**—Number of reports dropped because of the IGMP group policy. • **Total Interfaces**—Number of interfaces configured to support IGMP.

Sample Output

show igmp statistics

```
user@host> show igmp statistics
IGMP packet statistics for all interfaces
IGMP Message type      Received       Sent  Rx errors
Membership Query           8883        459          0
V1 Membership Report          0          0          0
```

```
DVMRP                          0          0          0
PIM V1                         0          0          0
Cisco Trace                    0          0          0
V2 Membership Report           0          0          0
Group Leave                    0          0          0
Mtrace Response                0          0          0
Mtrace Request                 0          0          0
Domain Wide Report             0          0          0
V3 Membership Report           0          0          0
Other Unknown types                                  0
IGMP v3 unsupported type                             0
IGMP v3 source required for SSM                      0
IGMP v3 mode not applicable for SSM                  0

IGMP Global Statistics
Bad Length                     0
Bad Checksum                   0
Bad Receive If                 0
Rx non-local                1227
Timed out                      0
Rejected Report                0
Total Interfaces               2
```

show igmp statistics interface

```
user@host> show igmp statistics interface fe-1/0/1.0
IGMP interface packet statistics for fe-1/0/1.0
IGMP Message type      Received       Sent  Rx errors
Membership Query              0        230          0
V1 Membership Report          0          0          0
```

show igmp-snooping membership

Syntax

show igmp-snooping membership
<**brief | detail**>
<**interface** ***interface-name***>
<**vlan** (***vlan-id*** | ***vlan-name***)>

Release Information

Command introduced in Junos OS Release 9.1 for EX Series switches.

Description

Display the multicast group membership information maintained by IGMP snooping.

Options

none—Display the multicast group membership information about all VLANs on which IGMP snooping is enabled.

brief | detail—(Optional) Display the specified level of output. The default is **brief**.

interface ***interface-name***—(Optional) Display the multicast group membership information about the specified interface.

vlan (***vlan-id*** | ***vlan-name***)—(Optional) Display the multicast group membership for the specified VLAN.

Required Privilege Level

view

Related Documentation

- show igmp-snooping route on page 167
- show igmp-snooping statistics on page 169
- *show igmp-snooping vlans*
- Verifying IGMP Snooping (CLI Procedure) on page 118
- *Configuring IGMP Snooping (CLI Procedure)*

List of Sample Output

show igmp-snooping membership on page 165
show igmp-snooping membership detail on page 165
show igmp-snooping membership vlan detail on page 166

Output Fields

Table 13 on page 164 lists the output fields for the **show igmp-snooping membership** command. Output fields are listed in the approximate order in which they appear.

Table 13: show igmp-snooping membership Output Fields

Field Name	Field Description	Level of Output
VLAN	Name of the VLAN.	All
Interfaces	Interfaces that are members of the listed multicast group.	All
Tag	Numerical identifier of the VLAN.	**detail**

Table 13: show igmp-snooping membership Output Fields *(continued)*

Field Name	Field Description	Level of Output
Router interfaces	List of information about multicast-router interfaces: • Name of the multicast-router interface. • **static** or **dynamic**—Whether the multicast-router interface is static or dynamic. • **Uptime**—For static interfaces, amount of time since the interface was configured as a multicast-router interface or since the interface last flapped. For dynamic interfaces, amount of time since the first query was received on the interface or since the interface last flapped. • **timeout**—Seconds remaining before a dynamic multicast-router interface times out.	**detail**
Group	IP multicast address of the multicast group. The following information is provided for the multicast group: • Name of the interface belonging to the multicast group. • **Last reporter**—Last host to report membership for the multicast group. • **Receiver count**—Number of hosts on the interface that are members of the multicast group. This field appears only if **immediate-leave** is configured on the VLAN. • **Uptime**—Length of time (in hours, minutes, and seconds) a multicast group has been active on the interface. • **timeout**—Time (in seconds) left until the entry for the multicast group is removed from the multicast group if no membership reports are received on the interface. This counter is reset to its maximum value when a membership report is received. • **Flags**—The lowest IGMP version in use by a host that is a member of the group on the interface. If the flag **static** is included, the interface has been configured as static member of the multicast group. • **Include source**—Multicast source addresses of all IGMPv3 membership reports received for the group on the interface.	**detail**

Sample Output

show igmp-snooping membership

```
user@switch> show igmp-snooping membership
VLAN: vlan24
    224.1.1.1      *
        Interfaces: ge-0/0/0.0
    224.1.1.100    *
        Interfaces: ge-0/0/0.0
    225.1.1.100    *
        Interfaces: ge-0/0/0.0
```

show igmp-snooping membership detail

```
user@switch> show igmp-snooping membership detail

VLAN: vlan2 Tag: 2 (Index: 3)
    Router interfaces:
```

```
        ge-1/0/0.0 dynamic Uptime: 00:14:24 timeout: 253
    Group: 225.0.0.1
      ge-1/0/17.0 259 Last reporter: 13.0.0.90 Receiver count: 1
      Uptime: 00:00:19 timeout: 259 Flags: <V3-hosts>
        Include source: 10.2.11.5, 10.2.11.12
```

show igmp-snooping membership vlan detail

```
user@switch> show igmp-snooping membership vlan vlan700 detail
VLAN: vlan700 Tag: 700 (Index: 52)
    Router interfaces:
        ae2.0 dynamic Uptime: 16:53:13 timeout: 245
   Group: 230.150.10.1
     ge-0/0/1.0 Last reporter: 100.2.188.201
     Uptime: 17:00:52 timeout: 237 Flags: <V2-hosts>
     ge-0/0/0.0 Last reporter: 100.2.188.202
     Uptime: 17:00:50 timeout: 243 Flags: <V2-hosts>
```

show igmp-snooping route

Syntax

show igmp-snooping route
<**brief** | **detail**>
<**ethernet-switching** | **inet**>
<**vlan** (***vlan-id*** | ***vlan-name***)>

Release Information

Command introduced in Junos OS Release 9.1 for EX Series switches.

Description

Display IGMP snooping route information.

Options

none—Display route information for all VLANs on which IGMP snooping is enabled.

brief | detail—(Optional) Display the specified level of output. The default is **brief**.

ethernet-switching—(Optional) Display information on Layer 2 multicast routes. This is the default.

inet—(Optional) Display information for Layer 3 multicast routes.

vlan (*vlan-id* | *vlan-name*)—(Optional) Display route information for the specified VLAN.

Required Privilege Level

view

Related Documentation

- show igmp-snooping membership on page 164
- show igmp-snooping statistics on page 169
- *show igmp-snooping vlans*
- Verifying IGMP Snooping (CLI Procedure) on page 118
- *Configuring IGMP Snooping (CLI Procedure)*

List of Sample Output

show igmp-snooping route vlan v18 on page 168
show igmp-snooping route detail on page 168
show igmp-snooping route inet detail on page 168

Output Fields

Table 14 on page 167 lists the output fields for the **show igmp-snooping route** command. Output fields are listed in the approximate order in which they appear.

Table 14: show igmp-snooping route Output Fields

Field Name	Field Description
Table	Routing table ID for virtual routing instances.
Routing Table	Routing table ID for virtual routing instances.
VLAN	Name of the VLAN on which IGMP snooping is enabled.
Group	Multicast IPv4 group address.

Table 14: show igmp-snooping route Output Fields *(continued)*

Field Name	Field Description
Next-hop	ID associated with the next-hop device.
Routing next-hop	ID associated with the Layer 3 next-hop device.
Interface or **Interfaces**	Name of the interface or interfaces in the VLAN associated with the multicast group.
Layer 2 next-hop	ID associated with the Layer 2 next-hop device.

Sample Output

show igmp-snooping route vlan v18

```
user@switch> show igmp-snooping route vlan v18
VLAN             Group          Next-hop
vlan18           224.0.0.0, *
vlan18           225.20.20.1, *     1539
```

show igmp-snooping route detail

```
user@switch> show igmp-snooping route detail
 VLAN             Group          Next-hop
 default          224.0.0.0, *
 vlan100          224.0.0.0, *       1332
         Interfaces: ge-1/0/1.0
 VLAN             Group          Next-hop
 vlan100          226.0.0.1, *       1334
         Interfaces: ge-1/0/1.0, ge-5/0/30.0
```

show igmp-snooping route inet detail

```
user@switch> show igmp-snooping route inet detail
Routing table: 0
Group: 229.0.0.1, 171.2.60.100
    Routing next-hop: 3448
        vlan.100
    Interface: vlan.100, VLAN: vlan100, Layer 2 next-hop: 3343
```

show igmp-snooping statistics

Syntax **show igmp-snooping statistics**

Release Information Command introduced in Junos OS Release 9.1 for EX Series switches.

Description Display IGMP snooping statistics.

Required Privilege Level view

Related Documentation

- clear igmp-snooping statistics on page 129
- show igmp-snooping membership on page 164
- show igmp-snooping route on page 167
- *show igmp-snooping vlans*
- Verifying IGMP Snooping (CLI Procedure) on page 118
- *Configuring IGMP Snooping (CLI Procedure)*

List of Sample Output show igmp-snooping statistics on page 170

Output Fields Table 15 on page 169 lists the output fields for the **show igmp-snooping statistics** command. Output fields are listed in the approximate order in which they appear.

Table 15: show igmp-snooping statistics Output Fields

Field Name	Field Description
Bad length	IGMP packet has illegal or bad length.
Bad checksum	IGMP or IP checksum is incorrect.
Invalid interface	Packet was received through an invalid interface.
Not local	Not used—always 0.
Receive unknown	Unknown IGMP type.
Timed out	Not used—always 0.
IGMP Type	Type of IGMP message (Query, Report, Leave, or Other).
Received	Number of IGMP packets received.
Transmitted	Number of IGMP packets transmitted.
Recv Errors	Number of packets received that did not conform to the IGMP version 1 (IGMPv1), IGMPv2, or IGMPv3 standards.

Sample Output

show igmp-snooping statistics

```
user@switch> show igmp-snooping statistics
Bad length: 0 Bad checksum: 0 Invalid interface: 0
Not local: 0 Receive unknown: 0 Timed out: 0

    IGMP Type           Received      Transmitted    Recv Errors
    Queries:               74295                0              0
    Reports:            18148423                0       16333523
    Leaves:                    0                0              0
    Other:                     0                0              0
```

show multicast flow-map

List of Syntax
Syntax on page 171
Syntax (EX Series Switch and the QFX Series) on page 171

Syntax
show multicast flow-map
<brief | detail>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast flow-map
<brief | detail>

Release Information
Command introduced in Junos OS Release 8.2.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display configuration information about IP multicast flow maps.

Options
none—Display configuration information about IP multicast flow maps on all systems.

brief | detail—(Optional) Display the specified level of output.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show multicast flow-map on page 172
show multicast flow-map detail on page 172

Output Fields
Table 16 on page 171 describes the output fields for the **show multicast flow-map** command. Output fields are listed in the approximate order in which they appear.

Table 16: show multicast flow-map Output Fields

Field Name	Field Description	Levels of Output
Name	Name of the flow map.	All levels
Policy	Name of the policy associated with the flow map.	All levels
Cache-timeout	Cache timeout value assigned to the flow map.	All levels
Bandwidth	Bandwidth setting associated with the flow map.	All levels
Adaptive	Whether or not adaptive mode is enabled for the flow map.	none
Flow-map	Name of the flow map.	**detail**

Table 16: show multicast flow-map Output Fields *(continued)*

Field Name	Field Description	Levels of Output
Adaptive Bandwidth	Whether or not adaptive mode is enabled for the flow map.	**detail**
Redundant Sources	Redundant sources defined for the same destination group.	**detail**

Sample Output

show multicast flow-map

```
user@host> show multicast flow-map
Instance: master
Name            Policy                  Cache timeout        Bandwidth Adaptive
map2            policy2                         never          2000000 no
map1            policy1                    60 seconds          2000000 no
```

Sample Output

show multicast flow-map detail

```
user@host> show multicast flow-map detail
Instance: master
Flow-map: map1
    Policy:             policy1
    Cache Timeout:      600 seconds
    Bandwidth:          2000000
    Adaptive Bandwidth: yes
    Redundant Sources:  11.11.11.11
    Redundant Sources:  11.11.11.12
    Redundant Sources:  11.11.11.13
```

show multicast interface

List of Syntax
Syntax on page 173
Syntax (EX Series Switch and the QFX Series) on page 173

Syntax
show multicast interface
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast interface

Release Information
Command introduced in Junos OS Release 8.3.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display bandwidth information about IP multicast interfaces.

Options
none—Display all interfaces that have multicast configured.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show multicast interface on page 174

Output Fields
Table 17 on page 173 describes the output fields for the **show multicast interface** command. Output fields are listed in the approximate order in which they appear.

Table 17: show multicast interface Output Fields

Field Name	Field Description
Interface	Name of the multicast interface.
Maximum bandwidth (bps)	Maximum bandwidth setting, in bits per second, for this interface.
Remaining bandwidth (bps)	Amount of bandwidth, in bits per second, remaining on the interface.
Mapped bandwidth deduction (bps)	Amount of bandwidth, in bits per second, used by any flows that are mapped to the interface. NOTE: Adding the mapped bandwidth deduction value to the local bandwidth deduction value results in the total deduction value for the interface. This field does not appear in the output when the no QoS adjustment feature is disabled.

Table 17: show multicast interface Output Fields *(continued)*

Field Name	Field Description
Local bandwidth deduction (bps)	Amount of bandwidth, in bits per second, used by any mapped flows that are traversing the interface. NOTE: Adding the mapped bandwidth deduction value to the local bandwidth deduction value results in the total deduction value for the interface. This field does not appear in the output when the no QoS adjustment feature is disabled.
Reverse OIF mapping	State of the reverse OIF mapping feature (**on** or **off**). NOTE: This field does not appear in the output when the no QoS adjustment feature is disabled.
Reverse OIF mapping no QoS adjustment	State of the no QoS adjustment feature (**on** or **off**) for interfaces that are using reverse OIF mapping. NOTE: This field does not appear in the output when the no QoS adjustment feature is disabled.
Leave timer	Amount of time a mapped interface remains active after the last mapping ends. NOTE: This field does not appear in the output when the no QoS adjustment feature is disabled.
No QoS adjustment	State (**on**) of the no QoS adjustment feature when this feature is enabled. NOTE: This field does not appear in the output when the no QoS adjustment feature is disabled.

Sample Output

show multicast interface

```
user@host> show multicast interface
Interface               Maximum bandwidth (bps) Remaining bandwidth (bps)
fe-0/0/3                              10000000                          0
fe-0/0/3.210                          10000000                   -2000000
fe-0/0/3.220                         100000000                  100000000
fe-0/0/3.230                          20000000                   18000000
fe-0/0/2.200                         100000000                  100000000
```

show multicast mrinfo

Syntax
show multicast mrinfo
<*host*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display configuration information about IP multicast networks, including neighboring multicast router addresses.

Options
none—Display configuration information about all multicast networks.

host—(Optional) Display configuration information about a particular host. Replace *host* with a hostname or IP address.

Required Privilege Level
view

List of Sample Output
show multicast mrinfo on page 176

Output Fields
Table 18 on page 175 describes the output fields for the **show multicast mrinfo** command. Output fields are listed in the approximate order in which they appear.

Table 18: show multicast mrinfo Output Fields

Field Name	Field Description
source-address	Query address, hostname (DNS name or IP address of the source address), and multicast protocol version or the software version of another vendor.
ip-address-1—>ip-address-2	Queried router interface address and directly attached neighbor interface address, respectively.
(*name* or *ip-address*)	Name or IP address of neighbor.

[*metric/threshold/type/flags*]	Neighbor's multicast profile:
	• ***metric***—Always has a value of **1**, because **mrinfo** queries the directly connected interfaces of a device.
	• ***threshold***—Multicast threshold time-to-live (TTL). The range of values is **0** through **255**.
	• ***type***—Multicast connection type: **pim** or **tunnel**.
	• ***flags***—Flags for this route:
	  • **querier**—Queried router is the designated router for the neighboring session.
	  • **leaf**—Link is a leaf in the multicast network.
	  • **down**—Link status indicator.

Sample Output

show multicast mrinfo

```
user@host> show multicast mrinfo 10.35.4.1
10.35.4.1 (10.35.4.1) [version 12.0]:
  192.168.195.166 -> 0.0.0.0 (local) [1/0/pim/querier/leaf]
  10.38.20.1 -> 0.0.0.0 (local) [1/0/pim/querier/leaf]
  10.47.1.1 -> 10.47.1.2 (10.47.1.2) [1/5/pim]
  0.0.0.0 -> 0.0.0.0 (local) [1/0/pim/down]
```

show multicast next-hops

List of Syntax
Syntax on page 177
Syntax (EX Series Switch and the QFX Series) on page 177

Syntax
show multicast next-hops
<brief | detail>
<*identifier-number*>
<inet | inet6>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast next-hops
<brief | detail>
<*identifier-number*>
<inet | inet6>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 option introduced in Junos OS Release 10.0 for EX Series switches.
detail option display of next-hop ID number introduced in Junos OS Release 11.1 for M Series and T Series routers and EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.

Description
Display the entries in the IP multicast next-hop table.

Options
none—Display standard information about all entries in the multicast next-hop table for all supported address families.

brief | detail—(Optional) Display the specified level of output.

When you include the **detail** option on M Series and T Series routers and EX Series switches, the downstream interface name includes the next-hop ID number in parentheses, in the form **fe-0/1/2.0-(1048574)** where **1048574** is the next-hop ID number.

identifier-number—(Optional) Show a particular next hop by ID number. The range of values is **1** through **65,535**.

inet | inet6—(Optional) Display entries for IPv4 or IPv6 family addresses, respectively.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show multicast next-hops on page 178
show multicast next-hops (Bidirectional PIM on page 178
show multicast next-hops brief on page 179
show multicast next-hops detail on page 179

Output Fields Table 19 on page 178 describes the output fields for the **show multicast next-hops** command. Output fields are listed in the approximate order in which they appear.

Table 19: show multicast next-hops Output Fields

Field Name	Field Description
Family	Protocol family (such as **INET**).
ID	Next-hop identifier of the prefix. The identifier is returned by the routing device's Packet Forwarding Engine.
Refcount	Number of cache entries that are using this next hop.
KRefcount	Kernel reference count for the next hop.
Downstream interface	Interface names associated with each multicast next-hop ID.
Incoming interface list	List of interfaces that accept incoming traffic. Only shown for routes that do not use strict RPF-based forwarding, for example for bidirectional PIM.

Sample Output

show multicast next-hops

```
user@host> show multicast next-hops
Family: INET
ID      Refcount  KRefcount Downstream interface
262142          4          2 so-1/0/0.0
262143          2          1 mt-1/1/0.49152
262148          2          1 mt-1/1/0.32769
```

show multicast next-hops (Bidirectional PIM

```
user@host> show multicast next-hops
Family: INET
ID          Refcount KRefcount Downstream interface
2097151            8         4 ge-0/0/1.0

Family: INET6
ID          Refcount KRefcount Downstream interface
2097157            2         1 ge-0/0/1.0

Family: Incoming interface list
ID          Refcount KRefcount Downstream interface
513                5         2 lo0.0
                               ge-0/0/1.0
514                5         2 lo0.0
                               ge-0/0/1.0
                               xe-4/1/0.0
515                3         1 lo0.0
                               ge-0/0/1.0
                               xe-4/1/0.0
544                1         0 lo0.0
                               xe-4/1/0.0
```

show multicast next-hops brief

The output for the **show multicast next-hops brief** command is identical to that for the **show multicast next-hops** command. For sample output, see show multicast next-hops on page 178.

show multicast next-hops detail

```
user@host> show multicast next-hops detail
Family: INET
ID          Refcount KRefcount Downstream interface
1048577            2         1 fe-0/1/2.0-(1048574)
                               ge-0/2/3.0-(1048576)
```

show multicast pim-to-igmp-proxy

List of Syntax
Syntax on page 180
Syntax (EX Series Switch and the QFX Series) on page 180

Syntax
show multicast pim-to-igmp-proxy
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast pim-to-igmp-proxy
<instance *instance-name*>

Release Information
Command introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 9.6 for EX Series switches.
instance option introduced in Junos OS Release 10.3.
instance option introduced in Junos OS Release 10.3 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display configuration information about PIM-to-IGMP message translation, also known as PIM-to-IGMP proxy.

Options
none—Display configuration information about PIM-to-IGMP message translation for all routing instances.

instance *instance-name*—(Optional) Display configuration information about PIM-to-IGMP message translation for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

Related Documentation
- *Configuring PIM-to-IGMP and PIM-to-MLD Message Translation*

List of Sample Output
show multicast pim-to-igmp-proxy on page 181
show multicast pim-to-igmp-proxy instance on page 181

Output Fields
Table 20 on page 180 describes the output fields for the **show multicast pim-to-igmp-proxy** command. Output fields are listed in the order in which they appear.

Table 20: show multicast pim-to-igmp-proxy Output Fields

Field Name	Field Description
Instance	Routing instance. Default instance is **master** (inet.0 routing table).
Proxy state	State of PIM-to-IGMP message translation, also known as PIM-to-IGMP proxy, on the configured upstream interfaces: **enabled** or **disabled**.

Table 20: show multicast pim-to-igmp-proxy Output Fields *(continued)*

Field Name	Field Description
interface-name	Name of upstream interface (no more than two allowed) on which PIM-to-IGMP message translation is configured.

Sample Output

show multicast pim-to-igmp-proxy

```
user@host> show multicast pim-to-igmp-proxy
Instance: master Proxy state: enabled
ge-0/1/0.1
ge-0/1/0.2
```

show multicast pim-to-igmp-proxy instance

```
user@host> show multicast pim-to-igmp-proxy instance VPN-A
Instance: VPN-A Proxy state: enabled
ge-0/1/0.1
```

show multicast pim-to-mld-proxy

List of Syntax

Syntax on page 182
Syntax (EX Series Switch and the QFX Series) on page 182

Syntax

show multicast pim-to-mld-proxy
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)

show multicast pim-to-mld-proxy
<instance *instance-name*>

Release Information

Command introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 9.6 for EX Series switches.
instance option introduced in Junos OS Release 10.3.
instance option introduced in Junos OS Release 10.3 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Display configuration information about PIM-to-MLD message translation, also known as PIM-to-MLD proxy.

Options

none—Display configuration information about PIM-to-MLD message translation for all routing instances.

instance ***instance-name***—(Optional) Display configuration information about PIM-to-MLD message translation for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level

view

List of Sample Output

show multicast pim-to-mld-proxy on page 183
show multicast pim-to-mld-proxy instance on page 183

Output Fields

Table 21 on page 182 describes the output fields for the **show multicast pim-to-mld-proxy** command. Output fields are listed in the order in which they appear.

Table 21: show multicast pim-to-mld-proxy Output Fields

Field Name	Field Description
Proxy state	State of PIM-to-MLD message translation, also known as PIM-to-MLD proxy, on the configured upstream interfaces: **enabled** or **disabled**.
interface-name	Name of upstream interface (no more than two allowed) on which PIM-to-MLD message translation is configured.

Sample Output

show multicast pim-to-mld-proxy

```
user@host> show multicast pim-to-mld-proxy
Instance: master Proxy state: enabled
ge-0/5/0.1
ge-0/5/0.2
```

show multicast pim-to-mld-proxy instance

```
user@host> show multicast pim-to-mld-proxy instance VPN-A
Instance: VPN-A Proxy state: enabled
ge-0/5/0.1
```

show multicast route

List of Syntax

Syntax on page 184
Syntax (EX Series Switch and the QFX Series) on page 184

Syntax

show multicast route
<brief | detail | extensive | summary>
<active | all | inactive>
<group *group*>
<inet | inet6>
<instance *instance name*>
<logical-system (all | *logical-system-name*)>
<*regular-expression*>
<source-prefix *source-prefix*>

Syntax (EX Series Switch and the QFX Series)

show multicast route
<brief | detail | extensive | summary>
<active | all | inactive>
<group *group*>
<inet | inet6>
<instance *instance name*>
<*regular-expression*>
<source-prefix *source-prefix*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.

Description

Display the entries in the IP multicast forwarding table. You can display similar information with the **show route table inet.1** command.

Options

none—Display standard information about all entries in the multicast forwarding table for all routing instances.

brief | detail | extensive | summary—(Optional) Display the specified level of output.

active | all | inactive—(Optional) Display all active entries, all entries, or all inactive entries, respectively, in the multicast forwarding table.

group *group*—(Optional) Display the cache entries for a particular group.

inet | inet6—(Optional) Display multicast forwarding table entries for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display entries in the multicast forwarding table for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

regular-expression—(Optional) Display information about the multicast forwarding table entries that match a UNIX OS-style regular expression.

source-prefix *source-prefix*—(Optional) Display the cache entries for a particular source prefix.

Required Privilege Level view

Related Documentation
- *Example: Configuring Multicast-Only Fast Reroute in a PIM Domain*

List of Sample Output
show multicast route on page 186
show multicast route (Bidirectional PIM) on page 187
show multicast route brief on page 187
show multicast route detail on page 188
show multicast route extensive (Bidirectional PIM) on page 188
show multicast route extensive (Multicast-Only Fast Reroute) on page 189
show multicast route instance <instance-name> on page 189
show multicast route summary on page 190

Output Fields Table 22 on page 185 describes the output fields for the **show multicast route** command. Output fields are listed in the approximate order in which they appear.

Table 22: show multicast route Output Fields

Field Name	Field Description	Level of Output
family	IPv4 address family (**INET**) or IPv6 address family (**INET6**).	All levels
Group	Group address. For any-source multicast routes, for example for bidirectional PIM, the group address includes the prefix length.	All levels
Source	Prefix and length of the source as it is in the multicast forwarding table.	All levels
Incoming interface list	List of interfaces that accept incoming traffic. Only shown for routes that do not use strict RPF-based forwarding, for example for bidirectional PIM.	All levels
Upstream interface	Name of the interface on which the packet with this source prefix is expected to arrive.	All levels
Upstream rpf interface list	When multicast-only fast reroute (MoFRR) is enabled, a PIM router propagates join messages on two upstream RPF interfaces to receive multicast traffic on both links for the same join request.	All levels
Downstream interface list	List of interface names to which the packet with this source prefix is forwarded.	All levels
Number of outgoing interfaces	Total number of outgoing interfaces for each (S,G) entry.	**extensive**

Table 22: show multicast route Output Fields *(continued)*

Field Name	Field Description	Level of Output
Session description	Name of the multicast session.	**detail extensive**
Statistics	Rate at which packets are being forwarded for this source and group entry (in Kbps and pps), and number of packets that have been forwarded to this prefix. If one or more of the kilobits per second packet forwarding statistic queries fails or times out, the statistics field displays **Forwarding statistics are not available**. NOTE: On QFX Series switches, this field does not report valid statistics.	**detail extensive**
Next-hop ID	Next-hop identifier of the prefix. The identifier is returned by the routing device's Packet Forwarding Engine and is also displayed in the output of the **show multicast nexthops** command.	**detail extensive**
Incoming interface list ID	For bidirectional PIM, incoming interface list identifier. Identifiers for interfaces that accept incoming traffic. Only shown for routes that do not use strict RPF-based forwarding, for example for bidirectional PIM.	**detail extensive**
Upstream protocol	The protocol that maintains the active multicast forwarding route for this group or source. When the **show multicast route extensive** command is used with the **display-origin-protocol** option, the field name is only **Protocol** and not **Upstream Protocol**. However, this field also displays the protocol that installed the active route.	**detail extensive**
Route type	Type of multicast route. Values can be (S,G) or (*,G).	**summary**
Route state	Whether the group is **Active** or **Inactive**.	**summary extensive**
Route count	Number of multicast routes.	**summary**
Forwarding state	Whether the prefix is pruned or forwarding.	**extensive**
Cache lifetime/timeout	Number of seconds until the prefix is removed from the multicast forwarding table. A value of **never** indicates a permanent forwarding entry. A value of **forever** indicates routes that do not have keepalive times.	**extensive**
Wrong incoming interface notifications	Number of times that the upstream interface was not available.	**extensive**
Uptime	Time since the creation of a multicast route.	**extensive**

Sample Output

show multicast route

```
user@host> show multicast route
Family: INET
```

```
Group: 228.0.0.0
    Source: 10.255.14.144/32
    Upstream interface: local
    Downstream interface list:
        so-1/0/0.0

Group: 239.1.1.1
    Source: 10.255.14.144/32
    Upstream interface: local
    Downstream interface list:
        so-1/0/0.0

Group: 239.1.1.1
    Source: 10.255.70.15/32
    Upstream interface: so-1/0/0.0
    Downstream interface list:
        mt-1/1/0.1081344

Family: INET6
```

show multicast route (Bidirectional PIM)

```
user@host> show multicast route
Family: INET

Group: 224.1.1.0/24
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0
    Downstream interface list:
        ge-0/0/1.0

Group: 224.1.3.0/24
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0 xe-4/1/0.0
    Downstream interface list:
        ge-0/0/1.0

Group: 225.1.1.0/24
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0
    Downstream interface list:
        ge-0/0/1.0

Group: 225.1.3.0/24
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0 xe-4/1/0.0
    Downstream interface list:
        ge-0/0/1.0
Family: INET6
```

show multicast route brief

The output for the **show multicast route brief** command is identical to that for the **show multicast route** command. For sample output, see show multicast route on page 186 or show multicast route (Bidirectional PIM) on page 187.

show multicast route detail

```
user@host> show multicast route detail
Family: INET

Group: 228.0.0.0
    Source: 10.255.14.144/32
    Upstream interface: local
    Downstream interface list:
        so-1/0/0.0
    Session description: Unknown
    Statistics: 8 kBps, 100 pps, 45272 packets
    Next-hop ID: 262142
    Upstream protocol: PIM

Group: 239.1.1.1
    Source: 10.255.14.144/32
    Upstream interface: local
    Downstream interface list:
        so-1/0/0.0
    Session description: Administratively Scoped
    Statistics: 0 kBps, 0 pps, 13404 packets
    Next-hop ID: 262142
    Upstream protocol: PIM

Group: 239.1.1.1
    Source: 10.255.70.15/32
    Upstream interface: so-1/0/0.0
    Downstream interface list:
        mt-1/1/0.1081344
    Session description: Administratively Scoped
    Statistics: 46 kBps, 1000 pps, 921077 packets

    Next-hop ID: 262143
    Upstream protocol: PIM

Family: INET6
```

show multicast route extensive (Bidirectional PIM)

```
user@host> show multicast route extensive
Family: INET

Group: 224.1.1.0/24
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0
    Downstream interface list:
        ge-0/0/1.0
    Number of outgoing interfaces: 1
    Session description: NOB Cross media facilities
    Statistics: 0 kBps, 0 pps, 0 packets
    Next-hop ID: 2097153
    Incoming interface list ID: 585
    Upstream protocol: PIM
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: forever
    Wrong incoming interface notifications: 0

Group: 224.1.3.0/24
```

```
    Source: *
    Incoming interface list:
        lo0.0 ge-0/0/1.0 xe-4/1/0.0
    Downstream interface list:
        ge-0/0/1.0
    Number of outgoing interfaces: 1
    Session description: NOB Cross media facilities
    Statistics: 0 kBps, 0 pps, 0 packets
    Next-hop ID: 2097153
    Incoming interface list ID: 589
    Upstream protocol: PIM
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: forever
    Wrong incoming interface notifications: 0

Family: INET6
```

show multicast route extensive (Multicast-Only Fast Reroute)

```
user@host> show multicast route extensive

Instance: master Family: INET

Group: 225.1.1.1
    Source: 10.0.0.1/32
    Upstream rpf interface list:
        fe-1/2/13.0 (P) fe-1/2/14.0 (B)
    Downstream interface list:
        fe-1/2/15.0
    Session description: Unknown
    Forwarding statistics are not available
    RPF Next-hop ID: 836
    Next-hop ID: 1048585
    Upstream protocol: PIM
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: 171 seconds
    Wrong incoming interface notifications: 0
    Uptime: 00:03:09
```

show multicast route instance <instance-name>

```
user@host> show multicast route instance v1 extensive
Instance: v1 Family: INET

Group: 224.1.1.1
    Source: (null)/0
    Upstream interface: fe-1/3/0.111
    Downstream interface list:
        lt-0/3/0.42 lt-0/3/0.46 lt-0/3/0.43
    Number of outgoing interfaces: 3

Group: 224.1.1.2
    Source: (null)/0
    Upstream interface: fe-1/3/0.111
    Downstream interface list:
        lt-0/3/0.42 lt-0/3/0.46 lt-0/3/0.43
    Number of outgoing interfaces: 3

Group: 224.1.1.3
```

```
    Source: (null)/0
    Upstream interface: fe-1/3/0.111
    Downstream interface list:
        lt-0/3/0.42 lt-0/3/0.46 lt-0/3/0.43
    Number of outgoing interfaces: 3

Instance: v1 Family: INET6
```

show multicast route summary

```
user@host>show multicast route summary
Instance: master Family: INET

Route type   Route state    Route count
(S,G)             Active             2
(S,G)             Inactive           3

Instance: master Family: INET6
```

show multicast rpf

List of Syntax
Syntax on page 191
Syntax (EX Series Switch and the QFX Series) on page 191

Syntax

show multicast rpf
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*prefix*>
<summary>

Syntax (EX Series Switch and the QFX Series)

show multicast rpf
<inet | inet6>
<instance *instance-name*>
<*prefix*>
<summary>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Display information about multicast reverse-path-forwarding (RPF) calculations.

Options

none—Display RPF calculation information for all supported address families.

inet | inet6—(Optional) Display the RPF calculation information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about multicast RPF calculations for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

prefix—(Optional) Display the RPF calculation information for the specified prefix.

summary—(Optional) Display a summary of all multicast RPF information.

Required Privilege Level

view

List of Sample Output

show multicast rpf on page 192
show multicast rpf inet6 on page 193
show multicast rpf prefix on page 194
show multicast rpf summary on page 194

Output Fields Table 23 on page 192 describes the output fields for the **show multicast rpf** command. Output fields are listed in the approximate order in which they appear.

Table 23: show multicast rpf Output Fields

Field Name	Field Description
Instance	Name of the routing instance. (Displayed when multicast is configured within a routing instance.)
Source prefix	Prefix and length of the source as it exists in the multicast forwarding table.
Protocol	How the route was learned.
Interface	Upstream RPF interface. NOTE: The displayed interface information does not apply to bidirectional PIM RP addresses. This is because the **show multicast rpf** command does not take into account equal-cost paths or the designated forwarder. For accurate upstream RPF interface information, always use the **show pim join extensive** command when bidirectional PIM is configured.
Neighbor	Upstream RPF neighbor. NOTE: The displayed neighbor information does not apply to bidirectional PIM. This is because the **show multicast rpf** command does not take into account equal-cost paths or the designated forwarder. For accurate upstream RPF neighbor information, always use the **show pim join extensive** command when bidirectional PIM is configured.

Sample Output

show multicast rpf

```
user@host> show multicast rpf

Multicast RPF table: inet.0, 12 entries

0.0.0.0/0
    Protocol: Static

10.255.14.132/32
    Protocol: Direct
    Interface: lo0.0

10.255.245.91/32
    Protocol: IS-IS
    Interface: so-1/1/1.0
    Neighbor: 192.168.195.21

127.0.0.1/32
Inactive172.16.0.0/12
Protocol: Static
Interface: fxp0.0
```

```
Neighbor: 192.168.14.254

192.168.0.0/16
Protocol: Static
Interface: fxp0.0
Neighbor: 192.168.14.254

192.168.14.0/24
Protocol: Direct
Interface: fxp0.0

192.168.14.132/32
Protocol: Local

192.168.195.20/30
Protocol: Direct
Interface: so-1/1/1.0

192.168.195.22/32
Protocol: Local

192.168.195.36/30
Protocol: IS-IS
Interface: so-1/1/1.0
Neighbor: 192.168.195.21
```

show multicast rpf inet6

```
user@host> show multicast rpf inet6

Multicast RPF table: inet6.0, 12 entries

::10.255.14.132/128
    Protocol: Direct
    Interface: lo0.0

::10.255.245.91/128
Protocol: IS-IS
Interface: so-1/1/1.0
Neighbor: fe80::2a0:a5ff:fe28:2e8c

::192.168.195.20/126
Protocol: Direct
Interface: so-1/1/1.0

::192.168.195.22/128
Protocol: Local

::192.168.195.36/126
Protocol: IS-IS
Interface: so-1/1/1.0
Neighbor: fe80::2a0:a5ff:fe28:2e8c

::192.168.195.76/126
Protocol: Direct
Interface: fe-2/2/0.0

::192.168.195.77/128
Protocol: Local
```

```
fe80::/64
Protocol: Direct
Interface: so-1/1/1.0

fe80::290:69ff:fe0c:993a/128
Protocol: Local

fe80::2a0:a5ff:fe12:84f/128
Protocol: Direct
Interface: lo0.0

ff02::2/128
Protocol: PIM

ff02::d/128
Protocol: PIM
```

show multicast rpf prefix

```
user@host> show multicast rpf ff02::/16

Multicast RPF table: inet6.0, 13 entries

ff02::2/128
    Protocol: PIM

ff02::d/128
    Protocol: PIM

...
```

show multicast rpf summary

```
user@host> show multicast rpf summary

Multicast RPF table: inet.0, 16 entries
Multicast RPF table: inet6.0, 12 entries
```

show multicast scope

List of Syntax
Syntax on page 195
Syntax (EX Series Switch and the QFX Series) on page 195

Syntax
show multicast scope
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast scope
<inet | inet6>
<instance *instance-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display administratively scoped IP multicast information.

Options
none—Display standard information about administratively scoped multicast information for all supported address families in all routing instances.

inet | inet6—(Optional) Display scoped multicast information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display administratively scoped information for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show multicast scope on page 196
show multicast scope inet on page 196
show multicast scope inet6 on page 196

Output Fields
Table 24 on page 195 describes the output fields for the **show multicast scope** command. Output fields are listed in the approximate order in which they appear.

Table 24: show multicast scope Output Fields

Field Name	Field Description
Scope name	Name of the multicast scope.
Group Prefix	Range of multicast groups that are scoped.
Interface	Interface that is the boundary of the administrative scope.

Table 24: show multicast scope Output Fields *(continued)*

Field Name	Field Description
Resolve Rejects	Number of kernel resolve rejects.

Sample Output

show multicast scope

```
user@host> show multicast scope
                                                          Resolve
Scope name           Group Prefix       Interface         Rejects
232-net              232.232.0.0/16     fe-0/0/0.1              0
local                239.255.0.0/16     fe-0/0/0.1              0
local                ff05::/16          fe-0/0/0.1              0
larry                ff05::1234/128     fe-0/0/0.1              0
```

show multicast scope inet

```
user@host> show multicast scope inet
                                                          Resolve
Scope name           Group Prefix       Interface         Rejects
232-net              232.232.0.0/16     fe-0/0/0.1              0
local                239.255.0.0/16     fe-0/0/0.1              0
```

show multicast scope inet6

```
user@host> show multicast scope inet6
                                                          Resolve
Scope name           Group Prefix       Interface         Rejects
local                ff05::/16          fe-0/0/0.1              0
larry                ff05::1234/128     fe-0/0/0.1              0
```

show multicast sessions

List of Syntax
Syntax on page 197
Syntax (EX Series Switch and the QFX Series) on page 197

Syntax
show multicast sessions
<brief | detail | extensive>
<logical-system (all | *logical-system-name*)>
<*regular-expression*>

Syntax (EX Series Switch and the QFX Series)
show multicast sessions
<brief | detail | extensive>
<*regular-expression*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display information about announced IP multicast sessions.

Options
none—Display standard information about all multicast sessions for all routing instances.

brief | detail | extensive—(Optional) Display the specified level of output.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

regular-expression—(Optional) Display information about announced sessions that match a UNIX-style regular expression.

Required Privilege Level
view

List of Sample Output
show multicast sessions on page 198
show multicast sessions regular-expression detail on page 198

Output Fields
Table 25 on page 197 describes the output fields for the **show multicast sessions** command. Output fields are listed in the approximate order in which they appear.

Table 25: show multicast sessions Output Fields

Field Name	Field Description
session-name	Name of the known announced multicast sessions.

Sample Output

show multicast sessions

```
user@host> show multicast sessions
1-Department of Biological Sciences, LSU
  ...
  Monterey Bay - DockCam
  Monterey Bay - JettyCam
  Monterey Bay - StandCam
  Monterey DockCam
  Monterey DockCam / ROV cam
  ...
  NASA TV (MPEG-1)
  ...
  UO Broadcast - NASA Videos - 25 Years of Progress
  UO Broadcast - NASA Videos - Journey through the Solar System
  UO Broadcast - NASA Videos - Life in the Universe
  UO Broadcast - NASA Videos - Nasa and the Airplane
  UO Broadcasts OPB's Oregon Story
  UO DOD News Clips
  UO Medical Management of Biological Casualties (1)
  UO Medical Management of Biological Casualties (2)
  UO Medical Management of Biological Casualties (3)
...
  376 active sessions.
```

show multicast sessions regular-expression detail

```
user@host> show multicast sessions "NASA TV" detail
SDP Version: 0  Originated by: -@128.223.83.33
 Session: NASA TV (MPEG-1)
 Description: NASA television in MPEG-1 format, provided by Private University.
Please contact the UO if you have problems with this feed.
 Email: Your Name Here <multicast@lists.private.edu>
 Phone: Your Name Here <888/555-1212>
Bandwidth: AS:1000
Start time: permanent
Stop time: none
Attribute: type:broadcast
Attribute: tool:IP/TV Content Manager 3.4.14
Attribute: live:capture:1
Attribute: x-iptv-capture:mp1s
Media: video 54302 RTP/AVP 32 31 96 97
Connection Data: 224.2.231.45 ttl 127
Attribute: quality:8
Attribute: framerate:30
Attribute: rtpmap:96 WBIH/90000
Attribute: rtpmap:97 MP4V-ES/90000
Attribute: x-iptv-svr:video 128.223.91.191 live
Attribute: fmtp:32 type=mpeg1
Media: audio 28848 RTP/AVP 14 0 96 3 5 97 98 99 100 101 102 10 11 103 104 105 106
 Connection Data: 224.2.145.37 ttl 127
Attribute: rtpmap:96 X-WAVE/8000
Attribute: rtpmap:97 L8/8000/2
Attribute: rtpmap:98 L8/8000
Attribute: rtpmap:99 L8/22050/2
Attribute: rtpmap:100 L8/22050
Attribute: rtpmap:101 L8/11025/2
Attribute: rtpmap:102 L8/11025
Attribute: rtpmap:103 L16/22050/2
```

```
Attribute: rtpmap:104 L16/22050

  1 matching sessions.
```

show multicast usage

List of Syntax
Syntax on page 200
Syntax (EX Series Switch and the QFX Series) on page 200

Syntax
show multicast usage
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show multicast usage
<brief | detail>
<inet | inet6>
<instance *instance-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
Display usage information about the 10 most active Distance Vector Multicast Routing Protocol (DVMRP) or Protocol Independent Multicast (PIM) groups.

Options
none—Display multicast usage information for all supported address families for all routing instances.

brief | detail—(Optional) Display the specified level of output.

inet | inet6—(Optional) Display usage information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about the most active DVMRP or PIM groups for a specific multicast instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show multicast usage on page 201
show multicast usage brief on page 201
show multicast usage instance on page 201
show multicast usage detail on page 202

Output Fields
Table 26 on page 201 describes the output fields for the **show multicast usage** command. Output fields are listed in the approximate order in which they appear.

Table 26: show multicast usage Output Fields

Field Name	Field Description
Instance	Name of the routing instance. (Displayed when multicast is configured within a routing instance.)
Group	Group address.
Sources	Number of sources.
Packets	Number of packets that have been forwarded to this prefix. If one or more of the packets forwarded statistic queries fails or times out, the packets field displays **unavailable**.
Bytes	Number of bytes that have been forwarded to this prefix. If one or more of the packets forwarded statistic queries fails or times out, the bytes field displays **unavailable**.
Prefix	IP address.
/len	Prefix length.
Groups	Number of multicast groups.

Sample Output

show multicast usage

```
user@host> show multicast usage
Group           Sources Packets             Bytes
228.0.0.0       1       52847               4439148
239.1.1.1       2       13450               1125530


Prefix          /len Groups Packets             Bytes
10.255.14.144   /32  2      66254               5561304
10.255.70.15    /32  1      43                  3374...
```

show multicast usage brief

The output for the **show multicast usage brief** command is identical to that for the **show multicast usage** command. For sample output, see show multicast usage on page 201.

show multicast usage instance

```
user@host> show multicast usage instance VPN-A
Group           Sources Packets             Bytes
224.2.127.254   1       5538                509496
224.0.1.39      1       13                  624
224.0.1.40      1       13                  624

Prefix          /len Groups Packets             Bytes
192.168.195.34  /32  1      5538                509496
10.255.14.30    /32  1      13                  624
```

```
10.255.245.91   /32  1      13                  624
...
```

show multicast usage detail

```
user@host> show multicast usage detail
Group           Sources Packets              Bytes
228.0.0.0       1       53159                4465356
    Source: 10.255.14.144   /32 Packets: 53159 Bytes: 4465356
239.1.1.1       2       13450                1125530
    Source: 10.255.14.144   /32 Packets: 13407 Bytes: 1122156
    Source: 10.255.70.15    /32 Packets: 43 Bytes: 3374


Prefix          /len Groups Packets              Bytes
10.255.14.144   /32  2      66566               5587512
    Group: 228.0.0.0       Packets: 53159 Bytes: 4465356
    Group: 239.1.1.1       Packets: 13407 Bytes: 1122156
10.255.70.15    /32  1      43                  3374
    Group: 239.1.1.1       Packets: 43 Bytes: 3374
```

show pim bootstrap

List of Syntax
Syntax on page 203
Syntax (EX Series Switch and the QFX Series) on page 203

Syntax
show pim bootstrap
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show pim bootstrap
<instance *instance-name*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
instance option introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description
For sparse mode only, display information about Protocol Independent Multicast (PIM) bootstrap routers.

Options
none—Display PIM bootstrap router information for all routing instances.

instance *instance-name*—(Optional) Display information about bootstrap routers for a specific PIM-enabled routing instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show pim bootstrap on page 204
show pim bootstrap instance on page 204

Output Fields
Table 27 on page 203 describes the output fields for the **show pim bootstrap** command. Output fields are listed in the approximate order in which they appear.

Table 27: show pim bootstrap Output Fields

Field Name	Field Description
Instance	Name of the routing instance.
BSR	Bootstrap router.
Pri	Priority of the routing device as elected to be the bootstrap router.
Local address	Local routing device address.
Pri	Local routing device address priority to be elected as the bootstrap router.

Table 27: show pim bootstrap Output Fields *(continued)*

Field Name	Field Description
State	Local routing device election state: **Candidate**, **Elected**, or **Ineligible**.
Timeout	How long until the local routing device declares the bootstrap router to be unreachable, in seconds.

Sample Output

show pim bootstrap

```
user@host> show pim bootstrap
Instance: PIM.master

BSR                    Pri Local address           Pri State      Timeout
None                     0 10.255.71.46              0 InEligible       0
feco:1:1:1:1:0:aff:785c 34 feco:1:1:1:1:0:aff:7c12   0 InEligible       0
```

show pim bootstrap instance

```
user@host> show pim bootstrap instance VPN-A
Instance: PIM.VPN-A

BSR             Pri Local address   Pri State      Timeout
None              0 192.168.196.105   0 InEligible       0
```

show pim interfaces

List of Syntax
Syntax on page 205
Syntax (EX Series Switch and the QFX Series) on page 205

Syntax
show pim interfaces
<inet | inet6>
<instance (*instance-name* | all)>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show pim interfaces
<inet | inet6>
<instance (*instance-name* | all)>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Commmand introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.
Support for the **instance all** option added in Junos OS Release 12.1.

Description
Display information about the interfaces on which Protocol Independent Multicast (PIM) is configured.

Options
none—Display interface information for all family addresses for the main instance.

inet | inet6—(Optional) Display interface information for IPv4 or IPv6 family addresses, respectively.

instance (*instance-name* | all)—(Optional) Display information about interfaces for a specific PIM-enabled routing instance or for all routing instances.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show pim interfaces on page 206

Output Fields
Table 28 on page 205 describes the output fields for the **show pim interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 28: show pim interfaces Output Fields

Field Name	Field Description
Instance	Name of the routing instance.
Name	Interface name.
State	State of the interface. The state also is displayed in the **show interfaces** command.

Table 28: show pim interfaces Output Fields *(continued)*

Field Name	Field Description
Mode	PIM mode running on the interface: • **B**—In bidirectional mode, multicast groups are carried across the network over bidirectional shared trees. This type of tree minimizes PIM routing state, which is especially important in networks with numerous and dispersed senders and receivers. • **S**—In sparse mode, routing devices must join and leave multicast groups explicitly. Upstream routing devices do not forward multicast traffic to this routing device unless this device has sent an explicit request (using a join message) to receive multicast traffic. • **Dense**—Unlike sparse mode, where data is forwarded only to routing devices sending an explicit request, dense mode implements a flood-and-prune mechanism, similar to DVMRP (the first multicast protocol used to support the multicast backbone). (Not supported on QFX Series.) • **Sparse-Dense**—Sparse-dense mode allows the interface to operate on a per-group basis in either sparse or dense mode. A group specified as **dense** is not mapped to a rendezvous point (RP). Instead, data packets destined for that group are forwarded using PIM-Dense Mode (PIM-DM) rules. A group specified as **sparse** is mapped to an RP, and data packets are forwarded using PIM-Sparse Mode (PIM-SM) rules. When sparse-dense mode is configured, the output includes both **S** and **D**. When bidirectional-sparse mode is configured, the output includes **S** and **B**. When bidirectional-sparse-dense mode is configured, the output includes **B**, **S**, and **D**.
IP	Version number of the address family on the interface: **4** (IPv4) or **6** (IPv6).
V	PIM version running on the interface: **1** or **2**.
State	State of PIM on the interface: • **Active**—Bidirectional mode is enabled on the interface and on all PIM neighbors. • **DR**—Designated router. • **NotCap**—Bidirectional mode is not enabled on the interface. This can happen when bidirectional PIM is not configured locally, when one of the neighbors is not configured for bidirectional PIM, or when one of the neighbors has not implemented the bidirectional PIM protocol. • **NotDR**—Not the designated router. • **P2P**—Point to point.
NbrCnt	Number of neighbors that have been seen on the interface.
JoinCnt(sg)	Number of (s,g) join messages that have been seen on the interface.
JointCnt(*g)	Number of (*,g) join messages that have been seen on the interface.
DR address	Address of the designated router.

Sample Output

show pim interfaces

```
user@host> show pim interfaces
Stat = Status, V = Version, NbrCnt = Neighbor Count,
S = Sparse, D = Dense, B = Bidirectional,
DR = Designated Router, P2P = Point-to-point link,
```

```
Active = Bidirectional is active, NotCap = Not Bidirectional Capable

Name               Stat Mode IP V State        NbrCnt JoinCnt(sg/*g) DR address
ge-0/3/0.0         Up   S     4 2 NotDR,NotCap      1 0/0           40.0.0.3
ge-0/3/3.50        Up   S     4 2 DR,NotCap         1 9901/100      50.0.0.2
ge-0/3/3.51        Up   S     4 2 DR,NotCap         1 0/0           51.0.0.2
pe-1/2/0.32769     Up   S     4 2 P2P,NotCap        0 0/0
```

show pim join

List of Syntax

Syntax on page 208
Syntax (EX Series Switch and the QFX Series) on page 208

Syntax

show pim join
<brief | detail | extensive | summary>
<bidirectional | dense | sparse>
<exact>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*range*>
<rp *ip-address/prefix* | source *ip-address/prefix*>
<sg | star-g>

Syntax (EX Series Switch and the QFX Series)

show pim join
<brief | detail | extensive | summary>
<dense | sparse>
<exact>
<inet | inet6>
<instance *instance-name*>
<*range*>
<rp *ip-address/prefix* | source *ip-address/prefix*>
<sg | star-g>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
summary option introduced in Junos OS Release 9.6.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Support for bidirectional PIM added in Junos OS Release 12.1.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Multiple new filter options introduced in Junos OS Release 13.2.

Description

Display information about Protocol Independent Multicast (PIM) groups for all PIM modes.

For bidirectional PIM, display information about PIM group ranges (*,G-range) for each active bidirectional RP group range, in addition to each of the joined (*,G) routes.

Options

none—Display the standard information about PIM groups for all supported family addresses for all routing instances.

brief | detail | extensive | summary—(Optional) Display the specified level of output.

bidirectional | dense | sparse—(Optional) Display information about PIM bidirectional mode, dense mode, or sparse and source-specific multicast (SSM) mode entries.

exact—(Optional) Display information about only the group that exactly matches the specified group address.

inet | inet6—(Optional) Display PIM group information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about groups for the specified PIM-enabled routing instance only.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

range—(Optional) Address range of the group, specified as ***prefix/prefix-length***.

rp *ip-address/prefix* | source *ip-address/prefix*—(Optional) Display information about the PIM entries with a specified rendezvous point (RP) address and prefix or with a specified source address and prefix. You can omit the prefix.

sg | star-g—(Optional) Display information about PIM (S,G) or (*,G) entries.

Required Privilege Level

view

Related Documentation

- clear pim join on page 135
- *Example: Configuring Multicast-Only Fast Reroute in a PIM Domain*
- *Example: Configuring Bidirectional PIM*
- *Example: Configuring PIM State Limits*

List of Sample Output

show pim join extensive (PIM Sparse Mode) on page 224
show pim join extensive (Bidirectional PIM) on page 225
show pim join extensive (Bidirectional PIM with a Directly Connected Phantom RP) on page 226
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Output Fields Table 29 on page 210 describes the output fields for the **show pim join** command. Output fields are listed in the approximate order in which they appear.

Table 29: show pim join Output Fields

Field Name	Field Description	Level of Output
Instance	Name of the routing instance.	**brief detail extensive summary** none
Family	Name of the address family: **inet** (IPv4) or **inet6** (IPv6).	**brief detail extensive summary** none
Route type	Type of multicast route: (S,G) or (*,G).	**summary**
Route count	Number of (S,G) routes and number of (*,G) routes.	**summary**
R	Rendezvous Point Tree.	**brief detail extensive** none
S	Sparse.	**brief detail extensive** none
W	Wildcard.	**brief detail extensive** none
Group	Group address.	**brief detail extensive** none
Bidirectional group prefix length	For bidirectional PIM, length of the IP prefix for RP group ranges.	All levels
Source	Multicast source: • ***** (wildcard value) • ***ipv4-address*** • ***ipv6-address***	**brief detail extensive** none
RP	Rendezvous point for the PIM group.	**brief detail extensive** none

Table 29: show pim join Output Fields *(continued)*

Field Name	Field Description	Level of Output
Flags	PIM flags: • **bidirectional**—Bidirectional mode entry. • **dense**—Dense mode entry. • **rptree**—Entry is on the rendezvous point tree. • **sparse**—Sparse mode entry. • **spt**—Entry is on the shortest-path tree for the source. • **wildcard**—Entry is on the shared tree.	**brief detail extensive** none
Upstream interface	RPF interface toward the source address for the source-specific state (S,G) or toward the rendezvous point (RP) address for the non-source-specific state (*,G). For bidirectional PIM, **RP Link** means that the interface is directly connected to a subnet that contains a phantom RP address. A pseudo multipoint LDP (M-LDP) interface appears on egress nodes in M-LDP point-to-multipoint LSPs with inband signaling.	**brief detail extensive** none
Upstream neighbor	Information about the upstream neighbor: **Direct**, **Local**, **Unknown**, or a specific IP address. For bidirectional PIM, **Direct** means that the interface is directly connected to a subnet that contains a phantom RP address. The multipoint LDP (M-LDP) root appears on egress nodes in M-LDP point-to-multipoint LSPs with inband signaling.	**extensive**
Active upstream interface	When multicast-only fast reroute (MoFRR) is configured in a PIM domain, the upstream interface for the active path. A PIM router propagates join messages on two upstream RPF interfaces to receive multicast traffic on both links for the same join request. Preference is given to two paths that do not converge to the same immediate upstream router. PIM installs appropriate multicast routes with upstream neighbors as RPF next hops with two (primary and backup) interfaces.	**extensive**
Active upstream neighbor	On the MoFRR primary path, the IP address of the neighbor that is directly connected to the active upstream interface.	**extensive**

Table 29: show pim join Output Fields *(continued)*

Field Name	Field Description	Level of Output
MoFRR Backup upstream interface	The MoFRR upstream interface that is used when the primary path fails. When the primary path fails, the backup path is upgraded to primary, and traffic is forwarded accordingly. If there are alternate paths available, a new backup path is calculated and the appropriate multicast route is updated or installed.	**extensive**
Upstream state	Information about the upstream interface: • **Join to RP**—Sending a join to the rendezvous point. • **Join to Source**—Sending a join to the source. • **Local RP**—Sending neither join messages nor prune messages toward the RP, because this routing device is the rendezvous point. • **Local Source**—Sending neither join messages nor prune messages toward the source, because the source is locally attached to this routing device. • **Prune to RP**—Sending a prune to the rendezvous point. • **Prune to Source**—Sending a prune to the source. NOTE: RP group range entries have **None** in the **Upstream state** field because RP group ranges do not trigger actual PIM join messages between routing devices.	**extensive**
Downstream neighbors	Information about downstream interfaces: • **Interface**—Interface name for the downstream neighbor. A pseudo PIM-SM interface appears for all IGMP-only interfaces. A pseudo multipoint LDP (M-LDP) interface appears on ingress root nodes in M-LDP point-to-multipoint LSPs with inband signaling. • **Interface address**—Address of the downstream neighbor. • **State**—Information about the downstream neighbor: **join** or **prune**. • **Flags**—PIM join flags: **R (RPtree)**, **S (Sparse)**, **W (Wildcard)**, or **zero**. • **Uptime**—Time since the downstream interface joined the group. • **Time since last Join**—Time since the last join message was received from the downstream interface. • **Time since last Prune**—Time since the last prune message was received from the downstream interface.	**extensive**

Table 29: show pim join Output Fields *(continued)*

Field Name	Field Description	Level of Output
Number of downstream interfaces	Total number of outgoing interfaces for each (S,G) entry.	**extensive**
Assert Timeout	Length of time between assert cycles on the downstream interface. Not displayed if the assert timer is null.	**extensive**
Keepalive timeout	Time remaining until the downstream join state is updated (in seconds). If the downstream join state is not updated before this keepalive timer reaches zero, the entry is deleted. If there is a directly connected host, **Keepalive timeout** is **Infinity**.	**extensive**
Uptime	Time since the creation of (S,G) or (*,G) state. The uptime is not refreshed every time a PIM join message is received for an existing (S,G) or (*,G) state.	**extensive**
Bidirectional accepting interfaces	Interfaces on the routing device that forward bidirectional PIM traffic. The reasons for forwarding bidirectional PIM traffic are that the interface is the winner of the designated forwarder election (**DF Winner**), or the interface is the reverse path forwarding (RPF) interface toward the RP (**RPF**).	**extensive**

Sample Output

show pim join summary

```
user@host> show pim join summary
Instance: PIM.master Family: INET

Route type           Route count
(s,g)                2
(*,g)                1

Instance: PIM.master Family: INET6
```

show pim join (PIM Sparse Mode)

```
user@host> show pim join
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
    Upstream interface: Local

Group: 239.1.1.1
```

```
    Source: 10.255.14.144
    Flags: sparse,spt
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.70.15
    Flags: sparse,spt
    Upstream interface: so-1/0/0.0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join (Bidirectional PIM)

```
user@host> show pim join
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 224.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0

Group: 224.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)

Group: 225.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0

Group: 225.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join inet6

```
user@host> show pim join inet6
Instance: PIM.master Family: INET6
 R = Rendezvous Point Tree, S = Sparse, W = Wildcard

 Group: ff04::e000:101
     Source: *
     RP: ::46.0.0.13
     Flags: sparse,rptree,wildcard
     Upstream interface: Local
```

```
Group: ff04::e000:101
    Source: ::1.1.1.1
    Flags: sparse
    Upstream interface: unknown (no neighbor)

Group: ff04::e800:101
    Source: ::1.1.1.1
    Flags: sparse
    Upstream interface: unknown (no neighbor)

Group: ff04::e800:101
    Source: ::1.1.1.2
    Flags: sparse
    Upstream interface: unknown (no neighbor)
```

show pim join inet6 star-g

```
user@host> show pim join inet6 star-g
Instance: PIM.master Family: INET6
 R = Rendezvous Point Tree, S = Sparse, W = Wildcard

 Group: ff04::e000:101
     Source: *
     RP: ::46.0.0.13
     Flags: sparse,rptree,wildcard
     Upstream interface: Local
```

show pim join instance <instance-name>

```
user@host> show pim join instance VPN-A
Instance: PIM.VPN-A Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 235.1.1.2
    Source: *
    RP: 10.10.47.100
    Flags: sparse,rptree,wildcard
    Upstream interface: Local

Group: 235.1.1.2
    Source: 192.168.195.74
    Flags: sparse,spt
    Upstream interface: at-0/3/1.0

Group: 235.1.1.2
    Source: 192.168.195.169
    Flags: sparse
    Upstream interface: so-1/0/1.0

Instance: PIM.VPN-A Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join detail

```
user@host> show pim join detail
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
```

```
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.14.144
    Flags: sparse,spt
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.70.15
    Flags: sparse,spt
    Upstream interface: so-1/0/0.0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (PIM Sparse Mode)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local RP
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: so-1/0/0.0
            10.111.10.2 State: Join Flags: SRW Timeout: 174
            Uptime: 00:03:49 Time since last Join: 00:01:49
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: SRW  Timeout: Infinity
            Uptime: 00:03:49 Time since last Join: 00:01:49
    Number of downstream interfaces: 2

Group: 239.1.1.1
    Source: 10.255.14.144
    Flags: sparse,spt
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local Source, Local RP
    Keepalive timeout: 344
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: so-1/0/0.0
            10.111.10.2 State: Join Flags: S Timeout: 174
            Uptime: 00:03:49 Time since last Prune: 00:01:49
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: S   Timeout: Infinity
            Uptime: 00:03:49 Time since last Prune: 00:01:49
    Number of downstream interfaces: 2

Group: 239.1.1.1
    Source: 10.255.70.15
    Flags: sparse,spt
    Upstream interface: so-1/0/0.0
    Upstream neighbor: 10.111.10.2
    Upstream state: Local RP, Join to Source
```

```
    Keepalive timeout: 344
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: Pseudo-GMP
            fe-0/0/0.0 fe-0/0/1.0 fe-0/0/3.0
        Interface: so-1/0/0.0 (pruned)
            10.111.10.2 State: Prune Flags: SR Timeout: 174
            Uptime: 00:03:49 Time since last Prune: 00:01:49
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: S   Timeout: Infinity
            Uptime: 00:03:49 Time since last Prune: 00:01:49
    Number of downstream interfaces: 3

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (Bidirectional PIM)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 224.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0
    Upstream neighbor: 10.10.1.2
    Upstream state: None
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
    Number of downstream interfaces: 0

Group: 225.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0
    Upstream neighbor: 10.10.1.2
    Upstream state: None
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
     Downstream neighbors:
         Interface: lt-1/0/10.24
             10.0.24.4 State: Join   RW  Timeout: 185
         Interface: lt-1/0/10.23
             10.0.23.3 State: Join   RW  Timeout: 184
     Number of downstream interfaces: 2

Group: 225.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)
```

```
    Upstream neighbor: Direct
    Upstream state: Local RP
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
        Interface: xe-4/1/0.0    (DF Winner)
    Number of downstream interfaces: 0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (Bidirectional PIM with a Directly Connected Phantom RP)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 224.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)
    Upstream neighbor: Direct
    Upstream state: Local RP
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
        Interface: xe-4/1/0.0    (DF Winner)
    Number of downstream interfaces: 0
```

show pim join instance <instance-name> extensive

```
user@host> show pim join instance VPN-A extensive
Instance: PIM.VPN-A Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 235.1.1.2
    Source: *
    RP: 10.10.47.100
    Flags: sparse,rptree,wildcard
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local RP
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: mt-1/1/0.32768
            10.10.47.101 State: Join Flags: SRW Timeout: 156
            Uptime: 00:03:49 Time since last Join: 00:01:49
    Number of downstream interfaces: 1

Group: 235.1.1.2
    Source: 192.168.195.74
    Flags: sparse,spt
    Upstream interface: at-0/3/1.0
    Upstream neighbor: 10.111.30.2
    Upstream state: Local RP, Join to Source
    Keepalive timeout: 156
    Uptime: 00:14:52
```

```
Group: 235.1.1.2
    Source: 192.168.195.169
    Flags: sparse
    Upstream interface: so-1/0/1.0
    Upstream neighbor: 10.111.20.2
    Upstream state: Local RP, Join to Source
    Keepalive timeout: 156
    Uptime: 00:14:52
```

show pim join extensive (Ingress Node with Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 232.1.1.1
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:55
    Downstream neighbors:
        Interface: Pseudo-MLDP
        Interface: lt-1/2/0.25
            1.2.5.2 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:27:55 Time since last Join: 11:27:55

Group: 232.1.1.2
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:41
    Downstream neighbors:
        Interface: Pseudo-MLDP

Group: 232.1.1.3
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:41
    Downstream neighbors:
        Interface: Pseudo-MLDP

Group: 232.2.2.2
    Source: 1.2.7.7
    Flags: sparse,spt
    Upstream interface: lt-1/2/0.27
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:25
    Downstream neighbors:
```

```
        Interface: Pseudo-MLDP

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: ff3e::1:2
    Source: abcd::1:2:7:7
    Flags: sparse,spt
    Upstream interface: lt-1/2/0.27
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:26
    Downstream neighbors:
        Interface: Pseudo-MLDP
```

show pim join extensive (Egress Node with Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 227.1.1.1
    Source: *
    RP: 1.1.1.1
    Flags: sparse,rptree,wildcard
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local RP
    Uptime: 11:31:33
    Downstream neighbors:
        Interface: fe-1/3/0.0
            192.168.209.9 State: Join Flags: SRW  Timeout: Infinity
            Uptime: 11:31:33 Time since last Join: 11:31:32

Group: 232.1.1.1
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream protocol: MLDP
    Upstream interface: Pseudo MLDP
    Upstream neighbor: MLDP LSP root <1.1.1.2>
    Upstream state: Join to Source
    Keepalive timeout:
    Uptime: 11:31:32
    Downstream neighbors:
        Interface: so-0/1/3.0
            192.168.92.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:30 Time since last Join: 11:31:30
    Downstream neighbors:
        Interface: fe-1/3/0.0
            192.168.209.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:32 Time since last Join: 11:31:32

Group: 232.1.1.2
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream protocol: MLDP
    Upstream interface: Pseudo MLDP
    Upstream neighbor: MLDP LSP root <1.1.1.2>
    Upstream state: Join to Source
    Keepalive timeout:
```

```
    Uptime: 11:31:32
    Downstream neighbors:
        Interface: so-0/1/3.0
            192.168.92.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:30 Time since last Join: 11:31:30
    Downstream neighbors:
        Interface: lt-1/2/0.14
            1.1.4.4 State: Join Flags: S Timeout: 177
            Uptime: 11:30:33 Time since last Join: 00:00:33
    Downstream neighbors:
        Interface: fe-1/3/0.0
            192.168.209.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:32 Time since last Join: 11:31:32

Group: 232.1.1.3
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream protocol: MLDP
    Upstream interface: Pseudo MLDP
    Upstream neighbor: MLDP LSP root <1.1.1.2>
    Upstream state: Join to Source
    Keepalive timeout:
    Uptime: 11:31:32
    Downstream neighbors:
        Interface: fe-1/3/0.0
            192.168.209.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:32 Time since last Join: 11:31:32

Group: 232.2.2.2
    Source: 1.2.7.7
    Flags: sparse,spt
    Upstream protocol: MLDP
    Upstream interface: Pseudo MLDP
    Upstream neighbor: MLDP LSP root <1.1.1.2>
    Upstream state: Join to Source
    Keepalive timeout:
    Uptime: 11:31:30
    Downstream neighbors:
        Interface: so-0/1/3.0
            192.168.92.9 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:30 Time since last Join: 11:31:30

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: ff3e::1:2
    Source: abcd::1:2:7:7
    Flags: sparse,spt
    Upstream protocol: MLDP
    Upstream interface: Pseudo MLDP
    Upstream neighbor: MLDP LSP root <1.1.1.2>
    Upstream state: Join to Source
    Keepalive timeout:
    Uptime: 11:31:32
    Downstream neighbors:
        Interface: fe-1/3/0.0
            fe80::21f:12ff:fea5:c4db State: Join Flags: S   Timeout: Infinity
            Uptime: 11:31:32 Time since last Join: 11:31:32
```

Sample Output

show pim join summary

```
user@host> show pim join summary
Instance: PIM.master Family: INET

Route type            Route count
(s,g)                 2
(*,g)                 1

Instance: PIM.master Family: INET6
```

show pim join (PIM Sparse Mode)

```
user@host> show pim join
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.14.144
    Flags: sparse,spt
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.70.15
    Flags: sparse,spt
    Upstream interface: so-1/0/0.0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join (Bidirectional PIM)

```
user@host> show pim join
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 224.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0

Group: 224.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)

Group: 225.1.1.0
    Bidirectional group prefix length: 24
    Source: *
```

```
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0

Group: 225.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join inet6

```
user@host> show pim join inet6
Instance: PIM.master Family: INET6
 R = Rendezvous Point Tree, S = Sparse, W = Wildcard

 Group: ff04::e000:101
     Source: *
     RP: ::46.0.0.13
     Flags: sparse,rptree,wildcard
     Upstream interface: Local

 Group: ff04::e000:101
     Source: ::1.1.1.1
     Flags: sparse
     Upstream interface: unknown (no neighbor)

 Group: ff04::e800:101
     Source: ::1.1.1.1
     Flags: sparse
     Upstream interface: unknown (no neighbor)

 Group: ff04::e800:101
     Source: ::1.1.1.2
     Flags: sparse
     Upstream interface: unknown (no neighbor)
```

show pim join inet6 star-g

```
user@host> show pim join inet6 star-g
Instance: PIM.master Family: INET6
 R = Rendezvous Point Tree, S = Sparse, W = Wildcard

 Group: ff04::e000:101
     Source: *
     RP: ::46.0.0.13
     Flags: sparse,rptree,wildcard
     Upstream interface: Local
```

show pim join instance <instance-name>

```
user@host> show pim join instance VPN-A
Instance: PIM.VPN-A Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 235.1.1.2
    Source: *
    RP: 10.10.47.100
```

```
    Flags: sparse,rptree,wildcard
    Upstream interface: Local

Group: 235.1.1.2
    Source: 192.168.195.74
    Flags: sparse,spt
    Upstream interface: at-0/3/1.0

Group: 235.1.1.2
    Source: 192.168.195.169
    Flags: sparse
    Upstream interface: so-1/0/1.0

Instance: PIM.VPN-A Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join detail

```
user@host> show pim join detail
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.14.144
    Flags: sparse,spt
    Upstream interface: Local

Group: 239.1.1.1
    Source: 10.255.70.15
    Flags: sparse,spt
    Upstream interface: so-1/0/0.0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (PIM Sparse Mode)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 239.1.1.1
    Source: *
    RP: 10.255.14.144
    Flags: sparse,rptree,wildcard
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local RP
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: so-1/0/0.0
            10.111.10.2 State: Join Flags: SRW Timeout: 174
            Uptime: 00:03:49 Time since last Join: 00:01:49
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: SRW  Timeout: Infinity
```

```
            Uptime: 00:03:49 Time since last Join: 00:01:49
        Number of downstream interfaces: 2

    Group: 239.1.1.1
        Source: 10.255.14.144
        Flags: sparse,spt
        Upstream interface: Local
        Upstream neighbor: Local
        Upstream state: Local Source, Local RP
        Keepalive timeout: 344
        Uptime: 00:03:49
        Downstream neighbors:
            Interface: so-1/0/0.0
                10.111.10.2 State: Join Flags: S Timeout: 174
                Uptime: 00:03:49 Time since last Prune: 00:01:49
            Interface: mt-1/1/0.32768
                10.10.47.100 State: Join Flags: S   Timeout: Infinity
                Uptime: 00:03:49 Time since last Prune: 00:01:49
        Number of downstream interfaces: 2

    Group: 239.1.1.1
        Source: 10.255.70.15
        Flags: sparse,spt
        Upstream interface: so-1/0/0.0
        Upstream neighbor: 10.111.10.2
        Upstream state: Local RP, Join to Source
        Keepalive timeout: 344
        Uptime: 00:03:49
        Downstream neighbors:
            Interface: Pseudo-GMP
                fe-0/0/0.0 fe-0/0/1.0 fe-0/0/3.0
            Interface: so-1/0/0.0 (pruned)
                10.111.10.2 State: Prune Flags: SR Timeout: 174
                Uptime: 00:03:49 Time since last Prune: 00:01:49
            Interface: mt-1/1/0.32768
                10.10.47.100 State: Join Flags: S   Timeout: Infinity
                Uptime: 00:03:49 Time since last Prune: 00:01:49
        Number of downstream interfaces: 3

    Instance: PIM.master Family: INET6
    R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (Bidirectional PIM)

```
    user@host> show pim join extensive
    Instance: PIM.master Family: INET
    R = Rendezvous Point Tree, S = Sparse, W = Wildcard

    Group: 224.1.1.0
        Bidirectional group prefix length: 24
        Source: *
        RP: 10.10.13.2
        Flags: bidirectional,rptree,wildcard
        Upstream interface: ge-0/0/1.0
        Upstream neighbor: 10.10.1.2
        Upstream state: None
        Uptime: 00:03:49
        Bidirectional accepting interfaces:
            Interface: ge-0/0/1.0    (RPF)
            Interface: lo0.0         (DF Winner)
        Number of downstream interfaces: 0
```

```
Group: 225.1.1.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.13.2
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0
    Upstream neighbor: 10.10.1.2
    Upstream state: None
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
     Downstream neighbors:
         Interface: lt-1/0/10.24
             10.0.24.4 State: Join   RW  Timeout: 185
         Interface: lt-1/0/10.23
             10.0.23.3 State: Join   RW  Timeout: 184
     Number of downstream interfaces: 2

Group: 225.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)
    Upstream neighbor: Direct
    Upstream state: Local RP
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
        Interface: xe-4/1/0.0    (DF Winner)
    Number of downstream interfaces: 0

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join extensive (Bidirectional PIM with a Directly Connected Phantom RP)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 224.1.3.0
    Bidirectional group prefix length: 24
    Source: *
    RP: 10.10.1.3
    Flags: bidirectional,rptree,wildcard
    Upstream interface: ge-0/0/1.0 (RP Link)
    Upstream neighbor: Direct
    Upstream state: Local RP
    Uptime: 00:03:49
    Bidirectional accepting interfaces:
        Interface: ge-0/0/1.0    (RPF)
        Interface: lo0.0         (DF Winner)
        Interface: xe-4/1/0.0    (DF Winner)
    Number of downstream interfaces: 0
```

show pim join instance <instance-name> extensive

```
user@host> show pim join instance VPN-A extensive
Instance: PIM.VPN-A Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 235.1.1.2
    Source: *
    RP: 10.10.47.100
    Flags: sparse,rptree,wildcard
    Upstream interface: Local
    Upstream neighbor: Local
    Upstream state: Local RP
    Uptime: 00:03:49
    Downstream neighbors:
        Interface: mt-1/1/0.32768
            10.10.47.101 State: Join Flags: SRW Timeout: 156
            Uptime: 00:03:49 Time since last Join: 00:01:49
    Number of downstream interfaces: 1

Group: 235.1.1.2
    Source: 192.168.195.74
    Flags: sparse,spt
    Upstream interface: at-0/3/1.0
    Upstream neighbor: 10.111.30.2
    Upstream state: Local RP, Join to Source
    Keepalive timeout: 156
    Uptime: 00:14:52

Group: 235.1.1.2
    Source: 192.168.195.169
    Flags: sparse
    Upstream interface: so-1/0/1.0
    Upstream neighbor: 10.111.20.2
    Upstream state: Local RP, Join to Source
    Keepalive timeout: 156
    Uptime: 00:14:52
```

show pim join extensive (Ingress Node with Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```
user@host> show pim join extensive
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 232.1.1.1
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:55
    Downstream neighbors:
        Interface: Pseudo-MLDP
        Interface: lt-1/2/0.25
            1.2.5.2 State: Join Flags: S   Timeout: Infinity
            Uptime: 11:27:55 Time since last Join: 11:27:55

Group: 232.1.1.2
    Source: 192.168.219.11
    Flags: sparse,spt
```

```
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:41
    Downstream neighbors:
        Interface: Pseudo-MLDP

Group: 232.1.1.3
    Source: 192.168.219.11
    Flags: sparse,spt
    Upstream interface: fe-1/3/1.0
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:41
    Downstream neighbors:
        Interface: Pseudo-MLDP

Group: 232.2.2.2
    Source: 1.2.7.7
    Flags: sparse,spt
    Upstream interface: lt-1/2/0.27
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:25
    Downstream neighbors:
        Interface: Pseudo-MLDP

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: ff3e::1:2
    Source: abcd::1:2:7:7
    Flags: sparse,spt
    Upstream interface: lt-1/2/0.27
    Upstream neighbor: Direct
    Upstream state: Local Source
    Keepalive timeout:
    Uptime: 11:27:26
    Downstream neighbors:
        Interface: Pseudo-MLDP
```

show pim join extensive (Multipoint LDP with Multicast-Only Fast Reroute)

```
user@host> show pim join 225.1.1.1 extensive sg
Instance: PIM.master Family: INET
R = Rendezvous Point Tree, S = Sparse, W = Wildcard

Group: 225.1.1.1
    Source: 10.0.0.1
    Flags: sparse,spt
    Active upstream interface: fe-1/2/13.0
    Active upstream neighbor: 10.0.0.9
    MoFRR Backup upstream interface: fe-1/2/14.0
    MoFRR Backup upstream neighbor: 10.0.0.21
    Upstream state: Join to Source, No Prune to RP
    Keepalive timeout: 354
    Uptime: 00:00:06
    Downstream neighbors:
```

```
    Interface: fe-1/2/15.0
        10.0.0.13 State: Join Flags: S   Timeout: Infinity
        Uptime: 00:00:06 Time since last Join: 00:00:06
Number of downstream interfaces: 1
```

show pim neighbors

List of Syntax
Syntax on page 230
Syntax (EX Series Switch and the QFX Series) on page 230

Syntax
show pim neighbors
<brief | detail>
<inet | inet6>
<instance (*instance-name* | all)>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)
show pim neighbors
<brief | detail>
<inet | inet6>
<instance (*instance-name* | all)>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.
Support for the **instance all** option added in Junos OS Release 12.1.

Description
Display information about Protocol Independent Multicast (PIM) neighbors.

Options
none—(Same as **brief**) Display standard information about PIM neighbors for all supported family addresses for the main instance.

brief | detail—(Optional) Display the specified level of output.

inet | inet6—(Optional) Display information about PIM neighbors for IPv4 or IPv6 family addresses, respectively.

instance (*instance-name* | all)—(Optional) Display information about neighbors for the specified PIM-enabled routing instance or for all routing instances.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

List of Sample Output
show pim neighbors on page 232
show pim neighbors brief on page 232
show pim neighbors instance on page 232
show pim neighbors detail on page 232
show pim neighbors detail (With BFD) on page 233

Output Fields
Table 30 on page 231 describes the output fields for the **show pim neighbors** command. Output fields are listed in the approximate order in which they appear.

Table 30: show pim neighbors Output Fields

Field Name	Field Description	Level of Output
Instance	Name of the routing instance.	All levels
Interface	Interface through which the neighbor is reachable.	All levels
Neighbor addr	Address of the neighboring PIM routing device.	All levels
IP	IP version: **4** or **6**.	All levels
V	PIM version running on the neighbor: **1** or **2**.	All levels
Mode	PIM mode of the neighbor: **Sparse**, **Dense**, **SparseDense**, or **Unknown**. When the neighbor is running PIM version 2, this mode is always **Unknown**.	All levels
Option	Can be one or more of the following: • **B**—Bidirectional Capable. • **H**—Hello Option Holdtime. • **G**—Generation Identifier. • **P**—Hello Option DR Priority. • **L**—Hello Option LAN Prune Delay.	**brief** none
Uptime	Time the neighbor has been operational since the PIM process was last initialized, in the format ***dd*:*hh*:*mm*:*ss* ago** for less than a week and ***nwnd*:*hh*:*mm*:*ss* ago** for more than a week.	All levels
Address	Address of the neighboring PIM routing device.	**detail**
BFD	Status and operational state of the Bidirectional Forwarding Detection (BFD) protocol on the interface: **Enabled**, **Operational state is up**, or **Disabled**.	**detail**
Hello Option Holdtime	Time for which the neighbor is available, in seconds. The range of values is **0** through **65,535.**	**detail**
Hello Default Holdtime	Default holdtime and the time remaining if the **holdtime** option is not in the received hello message.	**detail**
Hello Option DR Priority	Designated router election priority. The range of values is **0** through **255**.	**detail**
Hello Option Generation ID	9-digit or 10-digit number used to tag hello messages.	**detail**
Hello Option Bi-Directional PIM supported	Neighbor can process bidirectional PIM messages.	**detail**
Hello Option LAN Prune Delay	Time to wait before the neighbor receives prune messages, in the format **delay *nnn* ms override *nnnn* ms**.	**detail**

Table 30: show pim neighbors Output Fields *(continued)*

Field Name	Field Description	Level of Output
Join Suppression supported	Neighbor is capable of join suppression.	**detail**
Rx Join	Information about joins received from the neighbor. • **Group**—Group addresses in the join message. • **Source**—Address of the source in the join message. • **Timeout**—Time for which the join is valid.	**detail**

Sample Output

show pim neighbors

```
user@host> show pim neighbors
Instance: PIM.master
B = Bidirectional Capable, G = Generation Identifier,
H = Hello Option Holdtime, L = Hello Option LAN Prune Delay,
P = Hello Option DR Priority

Interface           IP V Mode        Option      Uptime Neighbor addr
so-1/0/0.0           4 2             HPLG      00:07:10 10.111.10.2
```

show pim neighbors brief

The output for the **show pim neighbors brief** command is identical to that for the **show pim neighbors** command. For sample output, see show pim neighbors on page 232.

show pim neighbors instance

```
user@host> show pim neighbors instance VPN-A
Instance: PIM.VPN-A
B = Bidirectional Capable, G = Generation Identifier,
H = Hello Option Holdtime, L = Hello Option LAN Prune Delay,
P = Hello Option DR Priority

Interface           IP V Mode        Option      Uptime Neighbor addr
at-0/3/1.0           4 2             HPLG      00:07:54 10.111.30.2
mt-1/1/0.32768       4 2             HPLG      00:07:22 10.10.47.101
so-1/0/1.0           4 2             HPLG      00:07:50 10.111.20.2
```

show pim neighbors detail

```
user@host> show pim neighbors detail
Instance: PIM.master
Interface: ge-0/0/1.0

    Address: 10.10.1.1, IPv4, PIM v2, Mode: SparseDense, sg Join Count: 0, tsg
Join Count: 2
        Hello Option Holdtime: 65535 seconds
        Hello Option DR Priority: 1
        Hello Option Generation ID: 2053759302
        Hello Option Bi-Directional PIM supported
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
                                      Join Suppression supported
```

```
    Address: 10.10.1.2, IPv4, PIM v2, sg Join Count: 0, tsg Join Count: 2
        BFD: Disabled
        Hello Option Holdtime: 105 seconds 93 remaining
        Hello Option DR Priority: 1
        Hello Option Generation ID: 1734018161
        Hello Option Bi-Directional PIM supported
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
                                      Join Suppression supported

Interface: lo0.0

    Address: 10.255.179.246,    IPv4, PIM v2, Mode: SparseDense, sg Join Count:
0, tsg Join Count: 0
        Hello Option Holdtime: 65535 seconds
        Hello Option DR Priority: 1
        Hello Option Generation ID: 1997462267
        Hello Option Bi-Directional PIM supported
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
                                      Join Suppression supported
```

show pim neighbors detail (With BFD)

```
user@host> show pim neighbors detail
Instance: PIM.master
Interface: fe-1/0/0.0
    Address: 192.168.11.1,        IPv4, PIM v2, Mode: Sparse
        Hello Option Holdtime: 65535 seconds
        Hello Option DR Priority: 1
        Hello Option Generation ID: 836607909
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms

    Address: 192.168.11.2,        IPv4, PIM v2
        BFD: Enabled, Operational state is up
        Hello Default Holdtime: 105 seconds 104 remaining
        Hello Option DR Priority: 1
        Hello Option Generation ID: 1907549685
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms

Interface: fe-1/0/1.0
    Address: 192.168.12.1,        IPv4, PIM v2
        BFD: Disabled
        Hello Default Holdtime: 105 seconds 80 remaining
        Hello Option DR Priority: 1
        Hello Option Generation ID: 1971554705
        Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
```

show pim rps

List of Syntax
Syntax on page 234
Syntax (EX Series Switch and the QFX Series) on page 234

Syntax

show pim rps
<brief | detail | extensive>
<*group-address*>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch and the QFX Series)

show pim rps
<brief | detail | extensive>
<*group-address*>
<inet | inet6>
<instance *instance-name*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.

Description

Display information about Protocol Independent Multicast (PIM) rendezvous points (RPs).

Options

none—Display standard information about PIM RPs for all groups and family addresses for all routing instances.

brief | detail | extensive—(Optional) Display the specified level of output.

group-address—(Optional) Display the RPs for a particular group. If you specify a group address, the output lists the routing device that is the RP for that group.

inet | inet6—(Optional) Display information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about RPs for a specific PIM-enabled routing instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level

view

Related Documentation

- *Example: Configuring Bidirectional PIM*

List of Sample Output

show pim rps on page 237
show pim rps brief on page 237
show pim rps <group-address> (Bidirectional PIM) on page 237

show pim rps <group-address> (PIM Dense Mode) on page 237
show pim rps <group-address> (SSM Range Without asm-override-ssm Configured) on page 237
show pim rps <group-address> (SSM Range With asm-override-ssm Configured and a Sparse-Mode RP) on page 238
show pim rps <group-address> (SSM Range With asm-override-ssm Configured and a Bidirectional RP) on page 238
show pim rps instance on page 238
show pim rps extensive (PIM Sparse Mode) on page 238
show pim rps extensive (Bidirectional PIM) on page 239
show pim rps extensive (PIM Anycast RP in Use) on page 239

Output Fields Table 31 on page 235 describes the output fields for the **show pim rps** command. Output fields are listed in the approximate order in which they appear.

Table 31: show pim rps Output Fields

Field Name	Field Description	Level of Output
Instance	Name of the routing instance.	All levels
Family or Address family	Name of the address family: **inet** (IPv4) or **inet6** (IPv6).	All levels
RP address	Address of the rendezvous point.	All levels
Type	Type of RP: • **auto-rp**—Address of the RP known through the Auto-RP protocol. • **bootstrap**—Address of the RP known through the bootstrap router protocol (BSR). • **embedded**—Address of the RP known through an embedded RP (IPv6). • **static**—Address of RP known through static configuration.	**brief** none
Holdtime	How long to keep the RP active, with time remaining, in seconds.	All levels
Timeout	How long until the local routing device determines the RP to be unreachable, in seconds.	All levels
Groups	Number of groups currently using this RP.	All levels
Group prefixes	Addresses of groups that this RP can span.	**brief** none
Learned via	Address and method by which the RP was learned.	**detail extensive**
Mode	The PIM mode of the RP: bidirectional or sparse. If a sparse and bidirectional RPs are configured with the same RP address, they appear as separate entries in both formats.	All levels
Time Active	How long the RP has been active, in the format ***hh:mm:ss***.	**detail extensive**

Table 31: show pim rps Output Fields *(continued)*

Field Name	Field Description	Level of Output
Device Index	Index value of the order in which Junos OS finds and initializes the interface. For bidirectional RPs, the **Device Index** output field is omitted because bidirectional RPs do not require encapsulation and de-encapsulation interfaces.	**detail extensive**
Subunit	Logical unit number of the interface. For bidirectional RPs, the **Subunit** output field is omitted because bidirectional RPs do not require encapsulation and de-encapsulation interfaces.	**detail extensive**
Interface	Either the encapsulation or the de-encapsulation logical interface, depending on whether this routing device is a designated router (DR) facing an RP router, or is the local RP, respectively. For bidirectional RPs, the **Interface** output field is omitted because bidirectional RPs do not require encapsulation and de-encapsulation interfaces.	**detail extensive**
Group Ranges	Addresses of groups that this RP spans.	**detail extensive** *group-address*
Active groups using RP	Number of groups currently using this RP.	**detail extensive**
total	Total number of active groups for this RP.	**detail extensive**
Register State for RP	Current register state for each group: • **Group**—Multicast group address. • **Source**—Multicast source address for which the PIM register is sent or received, depending on whether this router is a designated router facing an RP router, or is the local RP, respectively: • **First Hop**—PIM-designated routing device that sent the Register message (the source address in the IP header). • **RP Address**—RP to which the Register message was sent (the destination address in the IP header). • **State**: On the designated router: ◦ **Send**—Sending Register messages. ◦ **Probe**—Sent a null register. If a Register-Stop message does not arrive in 5 seconds, the designated router resumes sending Register messages. ◦ **Suppress**—Received a Register-Stop message. The designated router is waiting for the timer to resume before changing to **Probe** state. • On the RP: ◦ **Receive**—Receiving Register messages.	**extensive**
Anycast-PIM rpset	If anycast RP is configured, the addresses of the RPs in the set.	**extensive**
Anycast-PIM local address used	If anycast RP is configured, the local address used by the RP.	**extensive**

Table 31: show pim rps Output Fields *(continued)*

Field Name	Field Description	Level of Output

Anycast-PIM Register State	If anycast RP is configured, the current register state for each group:
	• **Group**—Multicast group address.
	• **Source**—Multicast source address for which the PIM register is sent or received, depending on whether this routing device is a designated router facing an RP router, or is the local RP, respectively.
	• **Origin**—How the information was obtained:
	  • **DIRECT**—From a local attachment
	  • **MSDP**—From the Multicast Source Discovery Protocol (MSDP)
	  • **DR**—From the designated router
		extensive

RP selected	For sparse mode and bidirectional mode, the identity of the RP for the specified group address.	*group-address*

Sample Output

show pim rps

```
user@host> show pim rps
Instance: PIM.master
Address family INET
RP address      Type        Mode   Holdtime Timeout Groups Group prefixes
10.10.1.3       static      bidir       150    None      2 224.1.3.0/24
                                                           225.1.3.0/24
10.10.13.2      static      bidir       150    None      2 224.1.1.0/24
                                                           225.1.1.0/24
```

show pim rps brief

The output for the **show pim rps brief** command is identical to that for the **show pim rps** command. For sample output, see show pim rps on page 237.

show pim rps <group-address> (Bidirectional PIM)

```
user@host> show pim rps 224.1.1.1
Instance: PIM.master

224.1.0.0/16
        11.4.12.75 (Bidirectional)

RP selected: 11.4.12.75
```

show pim rps <group-address> (PIM Dense Mode)

```
user@host> show pim rps 224.1.1.1
Instance: PIM.master

Dense Mode active for group 224.1.1.1
```

show pim rps <group-address> (SSM Range Without asm-override-ssm Configured)

```
user@host> show pim rps 224.1.1.1
```

```
Instance: PIM.master

Source-specific Mode (SSM) active for group 224.1.1.1
```

show pim rps <group-address> (SSM Range With asm-override-ssm Configured and a Sparse-Mode RP)

```
user@host> show pim rps 224.1.1.1
Instance: PIM.master

Source-specific Mode (SSM) active with Sparse Mode ASM override for group 224.1.1.1

224.1.0.0/16
        11.4.12.75

RP selected: 11.4.12.75
```

show pim rps <group-address> (SSM Range With asm-override-ssm Configured and a Bidirectional RP)

```
user@host> show pim rps 224.1.1.1
Instance: PIM.master

Source-specific Mode (SSM) active with Sparse Mode ASM override for group 224.1.1.1

224.1.0.0/16
        11.4.12.75 (Bidirectional)

RP selected: (null)
```

show pim rps instance

```
user@host> show pim rps instance VPN-A
Instance: PIM.VPN-A
Address family INET
RP address              Type        Holdtime Timeout Groups Group prefixes
10.10.47.100            static             0    None      1 224.0.0.0/4

Address family INET6
```

show pim rps extensive (PIM Sparse Mode)

```
user@host> show pim rps extensive
Instance: PIM.master

Family: INET
RP: 10.255.245.91
Learned via: static configuration
Time Active: 00:05:48
Holdtime: 45 with 36 remaining
Device Index: 122
Subunit: 32768
Interface: pd-6/0/0.32768
Group Ranges:
    224.0.0.0/4, 36s remaining
Active groups using RP:
    225.1.1.1

    total 1 groups active

Register State for RP:
Group           Source          FirstHop        RP Address      State    Timeout
225.1.1.1       192.168.195.78  10.255.14.132   10.255.245.91   Receive        0
```

show pim rps extensive (Bidirectional PIM)

```
user@host> show pim rps extensive
Instance: PIM.master
Address family INET

RP: 10.10.1.3
Learned via: static configuration
Mode: Bidirectional
Time Active: 01:58:07
Holdtime: 150
Group Ranges:
        224.1.3.0/24
        225.1.3.0/24

RP: 10.10.13.2
Learned via: static configuration
Mode: Bidirectional
Time Active: 01:58:07
Holdtime: 150
Group Ranges:
        224.1.1.0/24
        225.1.1.0/24
```

show pim rps extensive (PIM Anycast RP in Use)

```
user@host> show pim rps extensive
Instance: PIM.master

Family: INET
RP: 10.10.10.2
Learned via: static configuration
Time Active: 00:54:52
Holdtime: 0
Device Index: 130
Subunit: 32769
Interface: pimd.32769
Group Ranges:
    224.0.0.0/4
Active groups using RP:
    224.10.10.10

    total 1 groups active

Anycast-PIM rpset:
           10.100.111.34
           10.100.111.17
           10.100.111.55

Anycast-PIM local address used: 10.100.111.1
Anycast-PIM Register State:
Group                   Source                                  Origin
224.1.1.1               10.10.95.2                              DIRECT
224.1.1.2               10.10.95.2                              DIRECT
224.10.10.10            10.10.70.1                              MSDP
224.10.10.11            10.10.70.1                              MSDP
224.20.20.1             10.10.71.1                              DR

Address family INET6

Anycast-PIM rpset:
```

```
           ab::1
           ab::2
Anycast-PIM local address used: cd::1

Anycast-PIM Register State:
Group                   Source                                Origin
::224.1.1.1             ::10.10.95.2                          DIRECT
::224.1.1.2             ::10.10.95.2                          DIRECT
::224.20.20.1           ::10.10.71.1                          DR
```

show pim source

List of Syntax
Syntax on page 241
Syntax (EX Series Switch and the QFX Series) on page 241

Syntax

show pim source
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*source-prefix*>

Syntax (EX Series Switch and the QFX Series)

show pim source
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<*source-prefix*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.

Description

Display information about the Protocol Independent Multicast (PIM) source reverse path forwarding (RPF) state.

Options

none—Display standard information about the PIM RPF state for all supported family addresses for all routing instances.

brief | detail—(Optional) Display the specified level of output.

inet | inet6—(Optional) Display information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about the RPF state for a specific PIM-enabled routing instance.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

source-prefix—(Optional) Display the state for source RPF states in the given range.

Required Privilege Level

view

List of Sample Output

show pim source on page 242
show pim source brief on page 242
show pim source detail on page 242
show pim source (Egress Node with Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 243

Output Fields

Table 32 on page 242 describes the output fields for the **show pim source** command. Output fields are listed in the approximate order in which they appear.

Table 32: show pim source Output Fields

Field Name	Field Description
Instance	Name of the routing instance.
Source	Address of the source or reverse path.
Prefix/length	Prefix and prefix length for the route used to reach the RPF address.
Upstream Protocol	Protocol toward the source address.
Upstream interface	RPF interface toward the source address. A pseudo multipoint LDP (M-LDP) interface appears on egress nodes in M-LDP point-to-multipoint LSPs with inband signaling.
Upstream Neighbor	Address of the RPF neighbor used to reach the source address. The multipoint LDP (M-LDP) root appears on egress nodes in M-LDP point-to-multipoint LSPs with inband signaling.

Sample Output

show pim source

```
user@host> show pim source
Instance: PIM.master Family: INET

Source 10.255.14.144
    Prefix 10.255.14.144/32
    Upstream interface Local
    Upstream neighbor Local

Source 10.255.70.15
    Prefix 10.255.70.15/32
    Upstream interface so-1/0/0.0
    Upstream neighbor 10.111.10.2

Instance: PIM.master Family: INET6
```

show pim source brief

The output for the **show pim source brief** command is identical to that for the **show pim source** command. For sample output, see show pim source on page 242.

show pim source detail

```
user@host> show pim source detail
Instance: PIM.master Family: INET

Source 10.255.14.144
    Prefix 10.255.14.144/32
    Upstream interface Local
    Upstream neighbor Local
    Active groups:228.0.0.0
        239.1.1.1
```

```
        239.1.1.1

Source 10.255.70.15
    Prefix 10.255.70.15/32
    Upstream interface so-1/0/0.0
    Upstream neighbor 10.111.10.2
    Active groups:239.1.1.1

Instance: PIM.master Family: INET6
```

show pim source (Egress Node with Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```
user@host> show pim source
Instance: PIM.master Family: INET

Source 1.1.1.1
    Prefix 1.1.1.1/32
    Upstream interface Local
    Upstream neighbor Local

Source 1.2.7.7
    Prefix 1.2.7.0/24
    Upstream protocol MLDP
    Upstream interface Pseudo MLDP
    Upstream neighbor MLDP LSP root <1.1.1.2>

Source 192.168.219.11
    Prefix 192.168.219.0/28
    Upstream protocol MLDP
    Upstream interface Pseudo MLDP
    Upstream neighbor MLDP LSP root <1.1.1.2>

Instance: PIM.master Family: INET6

Source abcd::1:2:7:7
    Prefix abcd::1:2:7:0/120
    Upstream protocol MLDP
    Upstream interface Pseudo MLDP
    Upstream neighbor MLDP LSP root <1.1.1.2>
```

show pim statistics

List of Syntax
Syntax on page 244
Syntax (EX Series Switch and the QFX Series) on page 244

Syntax

```
show pim statistics
<inet |inet6)>
<instance instance-name>
<interface interface-name>
<logical-system (all | logical-system-name)>
```

Syntax (EX Series Switch and the QFX Series)

```
show pim statistics
<inet |inet6)>
<instance instance-name>
<interface interface-name>
```

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
inet6 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.
Command introduced in Junos OS Release 11.3 for the QFX Series.
Support for bidirectional PIM added in Junos OS Release 12.1.

Description
Display Protocol Independent Multicast (PIM) statistics.

Options
none—Display PIM statistics.

inet | inet6—(Optional) Display IPv4 or IPv6 PIM statistics, respectively.

instance *instance-name*—(Optional) Display statistics for a specific routing instance enabled by Protocol Independent Multicast (PIM).

interface *interface-name*—(Optional) Display statistics about the specified interface.

logical-system (all | *logical-system-name)*—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level
view

Related Documentation
- clear pim statistics on page 139

List of Sample Output
show pim statistics on page 251
show pim statistics inet interface <interface-name> on page 253
show pim statistics inet6 interface <interface-name> on page 253
show pim statistics instance <instance-name> on page 254
show pim statistics interface <interface-name> on page 255

Output Fields
Table 33 on page 245 describes the output fields for the **show pim statistics** command. Output fields are listed in the approximate order in which they appear.

Table 33: show pim statistics Output Fields

Field Name	Field Description
Instance	Name of the routing instance. This field only appears if you specify an interface, for example: • **inet interface *interface-name*** • **inet6 interface *interface-name*** • **interface *interface-name***
Family	Output is for IPv4 or IPv6 PIM statistics. **INET** indicates IPv4 statistics, and **INET6** indicates IPv6 statistics. This field only appears if you specify an interface, for example: • **inet interface *interface-name*** • **inet6 interface *interface-name*** • **interface *interface-name***
PIM statistics	PIM statistics for all interfaces or for the specified interface.
PIM message type	Message type for which statistics are displayed.
Received	Number of received statistics.
Sent	Number of messages sent of a certain type.
Rx errors	Number of received packets that contained errors.
V2 Hello	PIM version 2 hello packets.
V2 Register	PIM version 2 register packets.
V2 Register Stop	PIM version 2 register stop packets.
V2 Join Prune	PIM version 2 join and prune packets.
V2 Bootstrap	PIM version 2 bootstrap packets.
V2 Assert	PIM version 2 assert packets.
V2 Graft	PIM version 2 graft packets.
V2 Graft Ack	PIM version 2 graft acknowledgment packets.
V2 Candidate RP	PIM version 2 candidate RP packets.
V2 State Refresh	PIM version 2 control messages related to PIM dense mode (PIM-DM) state refresh. State refresh is an extension to PIM-DM. It not supported in Junos OS.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
V2 DF Election	PIM version 2 send and receive messages associated with bidirectional PIM designated forwarder election.
V1 Query	PIM version 1 query packets.
V1 Register	PIM version 1 register packets.
V1 Register Stop	PIM version 1 register stop packets.
V1 Join Prune	PIM version 1 join and prune packets.
V1 RP Reachability	PIM version 1 RP reachability packets.
V1 Assert	PIM version 1 assert packets.
V1 Graft	PIM version 1 graft packets.
V1 Graft Ack	PIM version 1 graft acknowledgment packets.
AutoRP Announce	Auto-RP announce packets.
AutoRP Mapping	Auto-RP mapping packets.
AutoRP Unknown type	Auto-RP packets with an unknown type.
Anycast Register	Auto-RP announce packets.
Anycast Register Stop	Auto-RP announce packets.
Global Statistics	Summary of PIM statistics for all interfaces.
Hello dropped on neighbor policy	Number of hello packets dropped because of a configured neighbor policy.
Unknown type	Number of PIM control packets received with an unknown type.
V1 Unknown type	Number of PIM version 1 control packets received with an unknown type.
Unknown Version	Number of PIM control packets received with an unknown version. The version is not version 1 or version 2.
Neighbor unknown	Number of PIM control packets received (excluding PIM hello) without first receiving the hello packet.
Bad Length	Number of PIM control packets received for which the packet size does not match the PIM length field in the packet.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
Bad Checksum	Number of PIM control packets received for which the calculated checksum does not match the checksum field in the packet.
Bad Receive If	Number of PIM control packets received on an interface that does not have PIM configured.
Rx Bad Data	Number of PIM control packets received that contain data for TCP Bad register packets.
Rx Intf disabled	Number of PIM control packets received on an interface that has PIM disabled.
Rx V1 Require V2	Number of PIM version 1 control packets received on an interface configured for PIM version 2.
Rx V2 Require V1	Number of PIM version 2 control packets received on an interface configured for PIM version 1.
Rx Register not RP	Number of PIM register packets received when the routing device is not the RP for the group.
Rx Register no route	Number of PIM register packets received when the RP does not have a unicast route back to the source.
Rx Register no decap if	Number of PIM register packets received when the RP does not have a de-encapsulation interface.
Null Register Timeout	Number of NULL register timeout packets.
RP Filtered Source	Number of PIM packets received when the routing device has a source address filter configured for the RP.
Rx Unknown Reg Stop	Number of register stop messages received with an unknown type.
Rx Join/Prune no state	Number of join and prune messages received for which the routing device has no state.
Rx Join/Prune on upstream if	Number of join and prune messages received on the interface used to reach the upstream routing device, toward the RP.
Rx Join/Prune for invalid group	Number of join or prune messages received for invalid multicast group addresses.
Rx Join/Prune messages dropped	Number of join and prune messages received and dropped.
Rx sparse join for dense group	Number of PIM sparse mode join messages received for a group that is configured for dense mode.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
Rx Graft/Graft Ack no state	Number of graft and graft acknowledgment messages received for which the router or switch has no state.
Rx Graft on upstream if	Number of graft messages received on the interface used to reach the upstream routing device, toward the RP.
Rx CRP not BSR	Number of BSR messages received in which the PIM message type is Candidate-RP-Advertisement, not Bootstrap.
Rx BSR when BSR	Number of BSR messages received in which the PIM message type is Bootstrap.
Rx BSR not RPF if	Number of BSR messages received on an interface that is not the RPF interface.
Rx unknown hello opt	Number of PIM hello packets received with options that Junos OS does not support.
Rx data no state	Number of PIM control packets received for which the routing device has no state for the data type.
Rx RP no state	Number of PIM control packets received for which the routing device has no state for the RP.
Rx aggregate	Number of PIM aggregate MDT packets received.
Rx malformed packet	Number of PIM control packets received with a malformed IP unicast or multicast address family.
No RP	Number of PIM control packets received with no RP address.
No register encap if	Number of PIM register packets received when the first-hop routing device does not have an encapsulation interface.
No route upstream	Number of PIM control packets received when the routing device does not have a unicast route to the the interface used to reach the upstream routing device, toward the RP.
Nexthop Unusable	Number of PIM control packets with an unusable nexthop. A path can be unusable if the route is hidden or the link is down.
RP mismatch	Number of PIM control packets received for which the routing device has an RP mismatch.
RP mode mismatch	RP mode (sparse or bidirectional) mismatches encountered when processing join and prune messages.
RPF neighbor unknown	Number of PIM control packets received for which the routing device has an unknown RPF neighbor for the source.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
Rx Joins/Prunes filtered	The number of join and prune messages filtered because of configured route filters and source address filters.
Tx Joins/Prunes filtered	The number of join and prune messages filtered because of configured route filters and source address filters.
Embedded-RP invalid addr	Number of packets received with an invalid embedded RP address in PIM join messages and other types of messages sent between routing domains.
Embedded-RP limit exceed	Number of times the limit configured with the **maximum-rps** statement is exceeded. The **maximum-rps** statement limits the number of embedded RPs created in a specific routing instance. The range is from 1 through 500. The default is 100.
Embedded-RP added	Number of packets in which the embedded RP for IPv6 is added. The following receive events trigger extraction of an IPv6 embedded RP address on the routing device: • Multicast Listener Discovery (MLD) report for an embedded RP multicast group address • PIM join message with an embedded RP multicast group address • Static embedded RP multicast group address associated with an interface • Packets sent to an embedded RP multicast group address received on the DR An embedded RP node discovered through these receive events is added if it does not already exist on the routing platform.
Embedded-RP removed	Number of packets in which the embedded RP for IPv6 is removed. The embedded RP is removed whenever all PIM join states using this RP are removed or the configuration changes to remove the embedded RP feature.
Rx Register msgs filtering drop	Number of received register messages dropped because of a filter configured for PIM register messages.
Tx Register msgs filtering drop	Number of register messages dropped because of a filter configured for PIM register messages.
Rx Bidir Join/Prune on non-Bidir if	Error counter for join and prune messages received on non-bidirectional PIM interfaces.
Rx Bidir Join/Prune on non-DF if	Error counter for join and prune messages received on non-designated forwarder interfaces.
V4 (S,G) Maximum	Maximum number of (S,G) IPv4 multicast routes accepted for the VPN routing and forwarding (VRF) routing instance. If this number is met, additional (S,G) entries are not accepted.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
V4 (S,G) Accepted	Number of accepted (S,G) IPv4 multicast routes.
V4 (S,G) Threshold	Threshold at which a warning message is logged (percentage of the maximum number of (S,G) IPv4 multicast routes accepted by the device).
V4 (S,G) Log Interval	Time (in seconds) between consecutive log messages.
V6 (S,G) Maximum	Maximum number of (S,G) IPv6 multicast routes accepted for the VPN routing and forwarding (VRF) routing instance. If this number is met, additional (S,G) entries are not accepted.
V6 (S,G) Accepted	Number of accepted (S,G) IPv6 multicast routes.
V6 (S,G) Threshold	Threshold at which a warning message is logged (percentage of the maximum number of (S,G) IPv6 multicast routes accepted by the device).
V6 (S,G) Log Interval	Time (in seconds) between consecutive log messages.
V4 (grp-prefix, RP) Maximum	Maximum number of group-to-rendezvous point (RP) IPv4 multicast mappings accepted for the VRF routing instance. If this number is met, additional mappings are not accepted.
V4 (grp-prefix, RP) Accepted	Number of accepted group-to-RP IPv4 multicast mappings.
V4 (grp-prefix, RP) Threshold	Threshold at which a warning message is logged (percentage of the maximum number of group-to-RP IPv4 multicast mappings accepted by the device).
V4 (grp-prefix, RP) Log Interval	Time (in seconds) between consecutive log messages.
V6 (grp-prefix, RP) Maximum	Maximum number of group-to RP IPv6 multicast mappings accepted for the VRF routing instance. If this number is met, additional mappings are not accepted.
V6 (grp-prefix, RP) Accepted	Number of accepted group-to-RP IPv6 multicast mappings.
V6 (grp-prefix, RP) Threshold	Threshold at which a warning message is logged (percentage of the maximum number of group-to-RP IPv6 multicast mappings accepted by the device).
V6 (grp-prefix, RP) Log Interval	Time (in seconds) between consecutive log messages.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
V4 Register Maximum	Maximum number of IPv4 PIM registers accepted for the VRF routing instance. If this number is met, additional PIM registers are not accepted. You configure the register limits on the RP.
V4 Register Accepted	Number of accepted IPv4 PIM registers.
V4 Register Threshold	Threshold at which a warning message is logged (percentage of the maximum number of IPv4 PIM registers accepted by the device).
V4 Register Log Interval	Time (in seconds) between consecutive log messages.
V6 Register Maximum	Maximum number of IPv6 PIM registers accepted for the VRF routing instance. If this number is met, additional PIM registers are not accepted. You configure the register limits on the RP.
V6 Register Accepted	Number of accepted IPv6 PIM registers.
V6 Register Threshold	Threshold at which a warning message is logged (percentage of the maximum number of IPv6 PIM registers accepted by the device).
V6 Register Log Interval	Time (in seconds) between consecutive log messages.
(*,G) Join drop due to SSM range check	PIM join messages that are dropped because the multicast addresses are outside of the SSM address range of 232.0.0.0 through 232.255.255.255. You can extend the accepted SSM address range by configuring the **ssm-groups** statement.

Sample Output

show pim statistics

```
user@host> show pim statistics
PIM Message type        Received       Sent  Rx errors
V2 Hello                      15         32          0
V2 Register                    0        362          0
V2 Register Stop             483          0          0
V2 Join Prune                 18        518          0
V2 Bootstrap                   0          0          0
V2 Assert                      0          0          0
V2 Graft                       0          0          0
V2 Graft Ack                   0          0          0
V2 Candidate RP                0          0          0
V2 State Refresh               0          0          0
V2 DF Election                 0          0          0
V1 Query                       0          0          0
V1 Register                    0          0          0
V1 Register Stop               0          0          0
V1 Join Prune                  0          0          0
```

```
V1 RP Reachability            0          0          0
V1 Assert                     0          0          0
V1 Graft                      0          0          0
V1 Graft Ack                  0          0          0
AutoRP Announce               0          0          0
AutoRP Mapping                0          0          0
AutoRP Unknown type           0
Anycast Register              0          0          0
Anycast Register Stop         0          0          0

Global Statistics

Hello dropped on neighbor policy              0
Unknown type                                  0
V1 Unknown type                               0
Unknown Version                               0
ipv4 BSR pkt drop due to excessive rate       0
ipv6 BSR pkt drop due to excessive rate       0
Neighbor unknown                              0
Bad Length                                    0
Bad Checksum                                  0
Bad Receive If                                0
Rx Bad Data                                   0
Rx Intf disabled                              0
Rx V1 Require V2                              0
Rx V2 Require V1                              0
Rx Register not RP                            0
Rx Register no route                          0
Rx Register no decap if                       0
Null Register Timeout                         0
RP Filtered Source                            0
Rx Unknown Reg Stop                           0
Rx Join/Prune no state                        0
Rx Join/Prune on upstream if                  0
Rx Join/Prune for invalid group               5
Rx Join/Prune messages dropped                0
Rx sparse join for dense group                0
Rx Graft/Graft Ack no state                   0
Rx Graft on upstream if                       0
Rx CRP not BSR                                0
Rx BSR when BSR                               0
Rx BSR not RPF if                             0
Rx unknown hello opt                          0
Rx data no state                              0
Rx RP no state                                0
Rx aggregate                                  0
Rx malformed packet                           0
Rx illegal TTL                                0
Rx illegal destination address                0
No RP                                         0
No register encap if                          0
No route upstream                             0
Nexthop Unusable                              0
RP mismatch                                   0
RP mode mismatch                              0
RPF neighbor unknown                          0
Rx Joins/Prunes filtered                      0
Tx Joins/Prunes filtered                      0
Embedded-RP invalid addr                      0
Embedded-RP limit exceed                      0
Embedded-RP added                             0
```

```
Embedded-RP removed                             0
Rx Register msgs filtering drop                 0
Tx Register msgs filtering drop                 0
Rx Bidir Join/Prune on non-Bidir if             0
Rx Bidir Join/Prune on non-DF if                0
(*,G) Join drop due to SSM range check          0
```

Sample Output

show pim statistics inet interface <interface-name>

```
user@host> show pim statistics inet interface ge-0/3/0.0
Instance: PIM.master Family: INET

PIM Interface statistics for ge-0/3/0.0

PIM Message type        Received       Sent  Rx errors
V2 Hello                       0          4          0
V2 Register                    0          0          0
V2 Register Stop               0          0          0
V2 Join Prune                  0          0          0
V2 Bootstrap                   0          0          0
V2 Assert                      0          0          0
V2 Graft                       0          0          0
V2 Graft Ack                   0          0          0
V2 Candidate RP                0          0          0
V1 Query                       0          0          0
V1 Register                    0          0          0
V1 Register Stop               0          0          0
V1 Join Prune                  0          0          0
V1 RP Reachability             0          0          0
V1 Assert                      0          0          0
V1 Graft                       0          0          0
V1 Graft Ack                   0          0          0
AutoRP Announce                0          0          0
AutoRP Mapping                 0          0          0
AutoRP Unknown type            0
Anycast Register               0          0          0
Anycast Register Stop          0          0          0
```

Sample Output

show pim statistics inet6 interface <interface-name>

```
user@host> show pim statistics inet6 interface ge-0/3/0.0
Instance: PIM.master Family: INET6

PIM Interface statistics for ge-0/3/0.0

PIM Message type        Received       Sent  Rx errors
V2 Hello                       0          4          0
V2 Register                    0          0          0
V2 Register Stop               0          0          0
V2 Join Prune                  0          0          0
V2 Bootstrap                   0          0          0
V2 Assert                      0          0          0
V2 Graft                       0          0          0
V2 Graft Ack                   0          0          0
V2 Candidate RP                0          0          0
Anycast Register               0          0          0
Anycast Register Stop          0          0          0
```

show pim statistics instance <instance-name>

```
user@host> show pim statistics instance VPN-A
PIM Message type        Received       Sent  Rx errors
V2 Hello                      31         37          0
V2 Register                    0          0          0
V2 Register Stop               0          0          0
V2 Join Prune                  0         16          0
V2 Bootstrap                   0          0          0
V2 Assert                      0          0          0
V2 Graft                       0          0          0
V2 Graft Ack                   0          0          0
V2 Candidate RP                0          0          0
V2 State Refresh               0          0          0
V2 DF Election                 0          0          0
V1 Query                       0          0          0
V1 Register                    0          0          0
V1 Register Stop               0          0          0
V1 Join Prune                  0          0          0
V1 RP Reachability             0          0          0
V1 Assert                      0          0          0
V1 Graft                       0          0          0
V1 Graft Ack                   0          0          0
AutoRP Announce                0          0          0
AutoRP Mapping                 0          0          0
AutoRP Unknown type            0
Anycast Register               0          0          0
Anycast Register Stop          0          0          0

Global Statistics

Hello dropped on neighbor policy              0
Unknown type                                  0
V1 Unknown type                               0
Unknown Version                               0
Neighbor unknown                              0
Bad Length                                    0
Bad Checksum                                  0
Bad Receive If                                0
Rx Bad Data                                   0
Rx Intf disabled                              0
Rx V1 Require V2                              0
Rx V2 Require V1                              0
Rx Register not RP                            0
Rx Register no route                          0
Rx Register no decap if                       0
Null Register Timeout                         0
RP Filtered Source                            0
Rx Unknown Reg Stop                           0
Rx Join/Prune no state                        0
Rx Join/Prune on upstream if                  0
Rx Join/Prune for invalid group               0
Rx Join/Prune messages dropped                0
Rx sparse join for dense group                0
Rx Graft/Graft Ack no state                   0
Rx Graft on upstream if                       0
Rx CRP not BSR                                0
Rx BSR when BSR                               0
Rx BSR not RPF if                             0
Rx unknown hello opt                          0
Rx data no state                              0
```

```
Rx RP no state                                  0
Rx aggregate                                    0
Rx malformed packet                             0
Rx illegal TTL                                  0
Rx illegal destination address                  0
No RP                                           0
No register encap if                            0
No route upstream                              28
Nexthop Unusable                                0
RP mismatch                                     0
RP mode mismatch                                0
RPF neighbor unknown                            0
Rx Joins/Prunes filtered                        0
Tx Joins/Prunes filtered                        0
Embedded-RP invalid addr                        0
Embedded-RP limit exceed                        0
Embedded-RP added                               0
Embedded-RP removed                             0
Rx Register msgs filtering drop                 0
Tx Register msgs filtering drop                 0
Rx Bidir Join/Prune on non-Bidir if             0
Rx Bidir Join/Prune on non-DF if                0
V4 (S,G) Maximum                               10
V4 (S,G) Accepted                               9
V4 (S,G) Threshold                             80
V4 (S,G) Log Interval                          80
V6 (S,G) Maximum                                8
V6 (S,G) Accepted                               8
V6 (S,G) Threshold                             50
V6 (S,G) Log Interval                         100
V4 (grp-prefix, RP) Maximum                   100
V4 (grp-prefix, RP) Accepted                    5
V4 (grp-prefix, RP) Threshold                  80
V4 (grp-prefix, RP) Log Interval               10
V6 (grp-prefix, RP) Maximum                    20
V6 (grp-prefix, RP) Accepted                    0
V6 (grp-prefix, RP) Threshold                  90
V6 (grp-prefix, RP) Log Interval               20
V4 Register Maximum                           100
V4 Register Accepted                           10
V4 Register Threshold                          80
V4 Register Log Interval                       10
V6 Register Maximum                            20
V6 Register Accepted                            0
V6 Register Threshold                          90
V6 Register Log Interval                       20
(*,G) Join drop due to SSM range check          0
```

Sample Output

show pim statistics interface <interface-name>

```
user@host> show pim statistics interface ge-0/3/0.0
Instance: PIM.master Family: INET

PIM Interface statistics for ge-0/3/0.0

PIM Message type        Received       Sent  Rx errors
V2 Hello                       0          3          0
V2 Register                    0          0          0
V2 Register Stop               0          0          0
```

```
V2 Join Prune                0          0          0
V2 Bootstrap                 0          0          0
V2 Assert                    0          0          0
V2 Graft                     0          0          0
V2 Graft Ack                 0          0          0
V2 Candidate RP              0          0          0
V1 Query                     0          0          0
V1 Register                  0          0          0
V1 Register Stop             0          0          0
V1 Join Prune                0          0          0
V1 RP Reachability           0          0          0
V1 Assert                    0          0          0
V1 Graft                     0          0          0
V1 Graft Ack                 0          0          0
AutoRP Announce              0          0          0
AutoRP Mapping               0          0          0
AutoRP Unknown type          0
Anycast Register             0          0          0
Anycast Register Stop        0          0          0

Instance: PIM.master Family: INET6

PIM Interface statistics for ge-0/3/0.0

PIM Message type        Received       Sent  Rx errors
V2 Hello                       0          3          0
V2 Register                    0          0          0
V2 Register Stop               0          0          0
V2 Join Prune                  0          0          0
V2 Bootstrap                   0          0          0
V2 Assert                      0          0          0
V2 Graft                       0          0          0
V2 Graft Ack                   0          0          0
V2 Candidate RP                0          0          0
Anycast Register               0          0          0
Anycast Register Stop          0          0          0
```