Junos® OS for EX Series Ethernet Switches, Release 10.4: Multicast

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About This Topic Collection

How to Use This Guide

Complete documentation for the EX Series product family is provided on webpages at http://www.juniper.net/techpubs/en_US/release-independent/information-products/pathway-pages/ex-series/product/index.html. We have selected content from these webpages and created a number of EX Series guides that collect related topics into a book-like format so that the information is easy to print and easy to download to your local computer.

The release notes are at http://www.juniper.net/techpubs/en_US/junos10.4/information-products/topic-collections/release-notes/10.4/junos-release-notes-10.4.pdf.

List of EX Series Guides for Junos OS Release 10.4

Title	Description
Complete Hardware Guide for EX2200 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX2200 Ethernet switches
Complete Hardware Guide for EX3200 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX3200 Ethernet switches
Complete Hardware Guide for EX4200 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX4200 Ethernet switches
Complete Hardware Guide for EX4500 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX4500 Ethernet switches

Title	Description
Complete Hardware Guide for EX8208 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8208 Ethernet switches
Complete Hardware Guide for EX8216 Ethernet Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8216 Ethernet switches
Complete Hardware Guide for the XRE200 External Routing Engine	Component descriptions, site preparation, installation, replacement, and safety and compliance information for the XRE200 External Routing Engine
Complete Software Guide for Junos® OS for EX Series Ethernet Switches, Release 10.4	Software feature descriptions, configuration examples, and tasks for Junos OS for EX Series switches
Software Topic Collections	Software feature descriptions, configuration examples and tasks, and reference pages for configuration statements and operational commands (This information also appears in the *Complete Software Guide for Junos® OS for EX Series Ethernet Switches, Release 10.4*.)
Junos® OS for EX Series Ethernet Switches, Release 10.4: EX4200 Virtual Chassis	
Junos® OS for EX Series Ethernet Switches, Release 10.4: EX8200 Virtual Chassis	
Junos® OS for EX Series Ethernet Switches, Release 10.4: Access Control	
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Documentation Symbols Key

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.

Text and Syntax Conventions		
Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces important new terms. • Identifies book names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS System Basics Configuration 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*
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; 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)	Enclose optional keywords or variables.	**stub <default-metric** ***metric*****>;**

Text and Syntax Conventions		
Convention	Description	Examples
| (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)	Enclose a variable for which you can substitute one or more values.	**community name members [** ***community-ids*** **]**

Indention and braces ({ })	Identify 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.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- Document URL or title
- Page number if applicable
- Software version
- Your name and company

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- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/ .
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- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://www.juniper.net/alerts/
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- 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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- 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

IGMP Snooping and Multicast

CHAPTER 1

Understanding IGMP Snooping and Multicast

IGMP Snooping on EX Series Switches Overview

Internet Group Management Protocol (IGMP) snooping regulates multicast traffic in a switched network. With IGMP snooping enabled, a LAN 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. Juniper Networks EX Series Ethernet Switches support IGMPv1, IGMPv2, and IGMPv3.

For details on IGMPv1, IGMPv2, and IGMPv3, see the following standards:

- For IGMPv1, see RFC 1112, *Host extensions for IP multicasting* at http://www.faqs.org/rfcs/rfc1112.html.
- For IGMPv2, see RFC 2236, *Internet Group Management Protocol, Version 2* at http://www.faqs.org/rfcs/rfc2236.html.
- For IGMPv3, see RFC 3376, *Internet Group Management Protocol, Version 3* at http://www.faqs.org/rfcs/rfc3376.html.

This IGMP snooping topic covers:

How IGMP Snooping Works

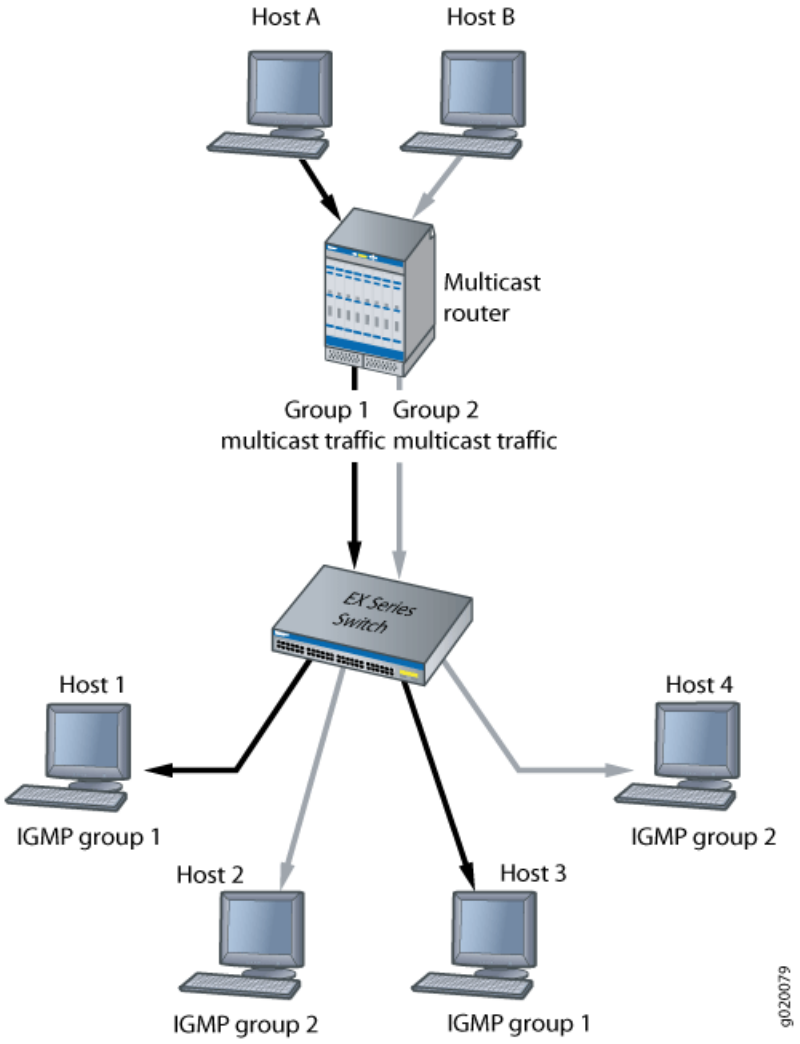
An EX Series switch usually learns *unicast* media access control (MAC) addresses by checking the source address field of the frames it receives. However, a *multicast* MAC

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.

IGMP snooping regulates multicast traffic on a VLAN to avoid flooding. When IGMP snooping is enabled, the switch intercepts IGMP packets and uses the content of the packets to build a multicast cache table. The cache table is a database of multicast groups and their corresponding member ports. The cache table is then used to regulate multicast traffic on the VLAN.

When the switch receives multicast packets, it uses the cache table to selectively forward the packets only to the ports that are members of the destination multicast group. Figure 1 on page 4 shows an example of IGMP traffic flow with IGMP snooping enabled.

Figure 1: IGMP Traffic Flow with IGMP Snooping Enabled



How IGMP Snooping Works with Routed VLAN Interfaces

Switches send traffic to hosts that are part of the same broadcast domain, but routers are needed to route traffic from one broadcast domain to another. Switches use a routed

VLAN interface (RVI) to perform these routing functions. IGMP snooping works with Layer 2 interfaces and RVIs to regulate multicast traffic in a switched network.

When a switch receives a multicast packet, the Packet Forwarding Engines in the switch perform an IP multicast lookup on the multicast packet to determine how to forward the packet to its local ports. From the results of the IP multicast lookup, each Packet Forwarding Engine extracts a list of Layer 3 interfaces (which can include VLAN interfaces) that have ports local to the Packet Forwarding Engine. If an RVI is part of this list, the switch provides a bridge multicast group ID for each RVI to the Packet Forwarding Engine.

A bridge multicast ID is assigned to direct Layer 3 interfaces and to RVIs. For VLANs that include multicast receivers, the bridge multicast ID includes a sub-next-hop ID. The sub-next-hop ID identifies the multicast Layer 2 interfaces in that VLAN that are interested in receiving the multicast stream. The switch ultimately assigns a next hop after it does a route lookup. The next hop includes all direct Layer 3 interfaces and RVIs. The Packet Forwarding Engine then forwards multicast traffic to the bridge multicast ID that includes all Layer 3 interfaces and RVIs that are multicast receivers for a given multicast group.

Figure 2 on page 6 shows how multicast traffic is forwarded on a multilayer switch. In this illustration, multicast traffic is coming in through the **xe-0/1/0.0** interface. A multicast group has been formed by the Layer 3 interface **ge-0/0/2.0**, **vlan.0**, and **vlan.1**. The **ge-2/0/0.0** interface is a common trunk interface that belongs to both **vlan.0** and **vlan.1**. The letter “R” next to an interface name in the illustration indicates that a multicast receiver host is associated with that interface.

NOTE: Traffic sent to an access interface is untagged; traffic sent to a trunk interface is tagged. For more information on VLAN tagging, see Understanding Bridging and VLANs on EX Series Switches.

Figure 2: IGMP Traffic Flow with Routed VLAN Interfaces

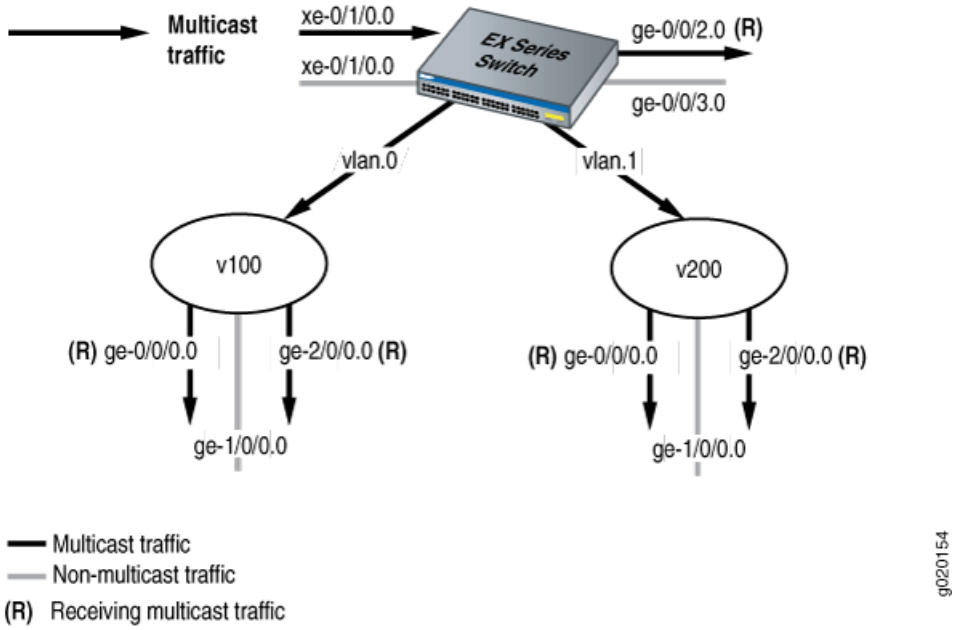


Table 1 on page 6 shows the bridge multicast IDs and next hops that are created. The term **subnh** refers to a sub-next hop. The Packet Forwarding Engine will forward multicast traffic to bridge multicast ID9.

Table 1: Bridge Multicast IDs and Next Hops

ID Number	Type of Next Hop	Next Hop	Tag Information
ID1	RHN_UNICAST	ge-0/0/0.0	tag=off
ID2	RHN_UNICAST	ge-2/0/0.0	tag=on
ID3	RHN_FLOOD	[ID1, ID2]	
ID4	RHN_UNICAST	ge-0/0/1.0	tag=off
ID5	RHN_FLOOD	[ID4, ID2]	
ID6	RHN_UNICAST	vlan.0	subnh=ID3
ID7	RHN_UNICAST	VLAN.1	subnh=ID5
ID8	RHN_UNICAST	ge-0/0/2.0	
ID9	RHN_FLOOD	[ID6, ID7, ID8]	

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.

To leave a multicast group, a host can either not respond to the periodic general IGMP queries, which results in a "silent leave" (the only leave option for hosts connected to switches running IGMPv1), or send a group-specific IGMPv2 leave message.

NOTE: A host does not leave a group if its link goes down—for example, if a user disconnects from the port. The host remains a member of the group until group membership times out and a silent leave occurs. This means that if another user connects to the port before the silent leave occurs, the host resumes receiving the group multicast traffic until the silent leave, even though it never sent an IGMP join message.

IGMP Snooping Support for IGMPv3

IGMPv3 allows IGMP snooping to filter multicast streams based on the source address of the multicast stream. Junos operating system (Junos OS) for EX Series switches supports IGMPv3 packets that are in INCLUDE or EXCLUDE mode.

When a host sends an IGMPv3 INCLUDE report through a switch interface to indicate that it wants to receive a multicast stream from a source address, the switch adds the source address to the source list. In INCLUDE mode, the switch requests that packets be sent to the specified multicast address only from those IP source addresses listed in the source-list parameter. However, because EX Series switches do not support forwarding on a per-source basis, the switch merges all IGMPv3 reports for a VLAN to create a **(*,G,V)** route with the appropriate next hop. This next hop contains all the interfaces on the VLAN that are interested in group **G**.

When IGMP snooping for IGMPv3 is used with an RVI, the same **(*,G,V)** route is added to the snooping information in the RVI's output interface list (**olist**).

When a host sends an IGMPv3 EXCLUDE report, the host indicates that it wants to join a multicast group and receive packets for that group *except* from those IP source addresses in the source-list parameter. However, because EX Series switches do not support forwarding on a per-source basis, the switch ignores the source information and creates a **(*,G,V)** route. 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. The switch creates a **(*, G,V)** route in this case also.

Related Documentation

- Understanding Multicast VLAN Registration on EX Series Switches on page 8
- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19
- RFC 3171, *IANA Guidelines for IPv4 Multicast Address Assignments* at http://tools.ietf.org/html/rfc3171

Understanding Multicast VLAN Registration on EX Series Switches

Multicast VLAN registration (MVR) allows you to efficiently distribute IPTV multicast streams across an Ethernet ring-based Layer 2 network and reduce the amount of bandwidth consumed by this multicast traffic.

In a standard Layer 2 network, a multicast stream received on one VLAN is never distributed to interfaces outside that VLAN. If hosts in multiple VLANs request the same multicast stream, a separate copy of that multicast stream is distributed to the requesting VLANs.

MVR introduces the concept of a *multicast source VLAN* (MVLAN), which is created by MVR and becomes the only VLAN over which IPTV multicast traffic flows throughout the Layer 2 network. The Juniper Networks EX Series Ethernet Switch that is enabled for MVR selectively forward IPTV multicast traffic from interfaces on the MVLAN (source interfaces) to hosts that are connected to interfaces that are not part of the MVLAN. These interfaces are known as *MVR receiver ports*. The MVR receiver ports can receive traffic from a port on the MVLAN but cannot send traffic onto the MVLAN, and they remain in their own VLANs for bandwidth and security reasons.

This topic includes:

How MVR Works

In many ways, MVR is similar to IGMP snooping. Both monitor IGMP join and leave messages and build forwarding tables based on the media access control (MAC) addresses of the hosts sending those IGMP messages. Whereas IGMP snooping operates within a given VLAN to regulate multicast traffic, MVR can operate with hosts on different VLANs in a Layer 2 network to selectively deliver IPTV multicast traffic to requesting hosts, thereby reducing the amount of bandwidth needed to forward multicast traffic.

When you configure an MVLAN, you assign a range of multicast group addresses to it. You then configure other VLANs to be MVR receiver VLANs, which receive multicast streams from the MVLAN. The MVR receiver ports comprise all the interfaces that exist on any of the MVR receiver VLANs. Interfaces that are on the MVLAN itself cannot be MVR receiver ports for that MVLAN.

NOTE: MVR is supported on VLANs running IGMP version 2 (IGMPv2) only.

MVR Modes

MVR operates in two modes: MVR transparent mode and MVR proxy mode. Both modes allow MVR to forward only one copy of a multicast stream to the Layer 2 network.

- MVR Transparent Mode on page 9
- MVR Proxy Mode on page 9

MVR Transparent Mode

In MVR transparent mode (the default mode), the switch receives one copy of each IPTV multicast stream and then replicates the stream only to those hosts that want to receive it, while forwarding all other types of multicast traffic without modification. Transparent mode is the default mode.

The switch handles IGMP packets destined for both the multicast source VLAN and multicast receiver VLANs in the same way that it handles them when MVR is not being used. That is, when a host on a VLAN sends IGMP join and leave messages, the switch floods the messages to all router interfaces in the VLAN. Similarly, when a VLAN receives IGMP queries from its router interfaces, it floods the queries to all interfaces in the VLAN.

If a host on a multicast receiver port joins an MVR group on the multicast receiver VLAN, the appropriate bridging entry is added and the MVLAN forwards that group's IPTV multicast traffic on that port (even though that port is not in the MVLAN). Likewise, if a host on a multicast receiver port leaves an MVR group on the multicast receiver VLAN, the appropriate bridging entry is deleted and the MVLAN stops forwarding that group's IPTV multicast traffic on that port. In addition, you can configure the switch to statically install the bridging entries on the multicast receiver VLAN.

MVR Proxy Mode

When you use MVR in proxy mode, the switch acts as a proxy for any MVR group in both the upstream and downstream directions. In the downstream direction, the switch acts as the querier for the groups in the MVR receiver VLANs. In the upstream direction, the switch originates the IGMP reports and leaves and answers IGMP queries from multicast routers. When the MVR receiver VLANs receive IGMP joins and leaves, the switch creates bridging entries on the MVLAN as needed, as it does in MVR transparent mode. In addition, the switch sends out IGMP joins and leaves on the MVLAN based on these bridging entries.

Configuring MVR proxy mode on the MVLAN automatically enables IGMP snooping proxy mode on all MVR receiver VLANs as well as on the MVLAN.

Related Documentation

- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

CHAPTER 2

Examples: IGMP Snooping and Multicast Configuration

Example: Configuring IGMP Snooping on EX Series Switches

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

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.

This example describes how to configure IGMP snooping:

Requirements

This example uses the following software and hardware components:

- One EX3200-24T switch
- Junos OS Release 9.5 or later for EX Series switches

Before you configure IGMP snooping, be sure you have:

- Configured the **employee-vlan** VLAN on the switch
- Assigned interfaces **ge-0/0/1**, **ge-0/0/2**, and **ge-0/0/3** to **employee-vlan**

See Example: Setting Up Bridging with Multiple VLANs for EX Series Switches.

Overview and Topology

IGMP snooping controls multicast traffic in a switched network. With IGMP snooping enabled, an EX Series switch monitors the IGMP transmissions between a host and a multicast router to keep track of the multicast groups and associated member ports. The switch uses this information to make intelligent decisions and forward multicast traffic to the intended destination interfaces.

You can configure IGMP snooping on all interfaces in a VLAN or on individual interfaces. This example shows how to configure IGMP snooping on an EX Series switch.

The configuration setup for this example includes the VLAN **employee-vlan** on the switch.

Table 2 on page 12 shows the components of the topology for this example.

Table 2: Components of the IGMP Snooping Topology

Properties	Settings
Switch hardware	One EX3200-24T switch
VLAN name	**employee-vlan**, tag **20**
Interfaces in **employee-vlan**	**ge-0/0/1**, **ge-0/0/2**, **ge-0/0/3**
Multicast IP address for **employee-vlan**	**225.100.100.100**

In this example, the switch is initially configured as follows:

- IGMP snooping is disabled on the VLAN.

Configuration

To configure basic 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 protocols]
set igmp-snooping vlan employee-vlan
set igmp-snooping vlan employee-vlan interface ge-0/0/1 group-limit 50
set igmp-snooping vlan employee-vlan immediate-leave
set igmp-snooping vlan employee-vlan interface ge-0/0/3 static group 225.100.100.100
set igmp-snooping vlan employee-vlan interface ge-0/0/2 multicast-router-interface
set igmp-snooping vlan employee-vlan robust-count 4
```

Step-by-Step Procedure

Configure IGMP snooping:

1. Enable and configure IGMP snooping on the VLAN **employee-vlan**:

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

2. Configure the limit for the number of multicast groups allowed on the **ge-0/0/1** interface to 50.

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/1 group-limit
50
```

3. Configure the switch to immediately remove a group membership from an interface when it receives a leave message from that interface without waiting for any other IGMP messages to be exchanged (IGMPv2 only):

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

4. Statically configure IGMP group membership on a port:

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/3.0 static group
225.100.100.100
```

5. Statically configure an interface as a switching interface toward a multicast router (the interface to receive multicast traffic):

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/2
multicast-router-interface
```

6. Change the number of timeout intervals the switch waits before timing out a multicast group to 4:

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan robust-count 4
```

Results Check the results of the configuration:

```
user@switch# show protocols igmp-snooping
  vlan employee-vlan {
    robust-count 4;
    immediate-leave;
    interface ge-0/0/1 {
      group-limit 50;
    }
    interface ge-0/0/2 {
      multicast-router-interface;
    }
    interface ge-0/0/3 {
      static {
        group 255.100.100.100
      }
    }
  }
```

Related Documentation

- Configuring IGMP Snooping (CLI Procedure) on page 19
- [edit protocols] Configuration Statement Hierarchy on page 29

Example: Configuring Multicast VLAN Registration on EX Series Switches

Multicast VLAN registration (MVR) allows hosts that are not part of a multicast VLAN (MVLAN) to receive multicast streams from the MVLAN, allowing the MVLAN to be shared across the Layer 2 network and eliminating the need to send duplicate multicast streams to each requesting VLAN in the network. Hosts remain in their own VLANs for bandwidth and security reasons.

This example describes how to configure MVR on EX Series switches:

Requirements

This example uses the following hardware and software components:

- One EX Series switch
- Junos OS Release 9.6 or later for EX Series switches

Before you configure MVR, be sure you have:

- Configured two or more VLANs on the switch. See Example: Setting Up Bridging with Multiple VLANs for EX Series Switches.
- Connected the EX Series switch to a network that can transmit IPTV multicast streams from a video server.
- Connected a host that is capable of receiving IPTV multicast streams to an interface in one of the VLANs.

Overview and Topology

In a standard Layer 2 network, a multicast stream received on one VLAN is never distributed to interfaces outside that VLAN. If hosts in multiple VLANs request the same multicast stream, a separate copy of that multicast stream is distributed to the requesting VLANs.

MVR introduces the concept of a *multicast source VLAN* (MVLAN), which is created by MVR and becomes the only VLAN over which multicast traffic flows throughout the Layer 2 network. Multicast traffic can then be selectively forwarded from interfaces on the MVLAN (source ports) to hosts that are connected to interfaces (multicast receiver ports) that are not part of the multicast source VLAN. When you configure an MVLAN, you assign a range of multicast group addresses to it. You then configure other VLANs to be MVR receiver VLANs, which receive multicast streams from the MVLAN. The MVR receiver ports comprise all the interfaces that exist on any of the MVR receiver VLANs.

You can configure MVR to operate in one of two modes: transparent mode (the default mode) or proxy mode. Both modes allow MVR to forward only one copy of a multicast stream to the Layer 2 network.

In transparent mode, the switch receives one copy of each IPTV multicast stream and then replicates the stream only to those hosts that want to receive it, while forwarding all other types of multicast traffic without modification. Figure 1 shows how MVR operates in transparent mode.

In proxy mode, the switch acts as a proxy for the IGMP multicast router in the MVLAN for MVR group memberships established in the MVR receiver VLANs and generates and sends IGMP packets into the MVLAN as needed. Figure 2 shows how MVR operates in proxy mode.

This example shows how to configure MVR in both transparent mode and proxy mode on an EX Series switch. The topology includes a video server that is connected to a multicast router, which in turn forwards the IPTV multicast traffic in the MVLAN to the Layer 2 network.

Figure 3 on page 16 shows the MVR topology in transparent mode. Interfaces P1 and P2 on Switch C belong to service VLAN **s0** and MVLAN **mv0**. Interface P4 of Switch C also belongs to service VLAN **s0**. In the upstream direction of the network, only non-IPTV traffic is being carried in individual customer VLANs of service VLAN **s0**. VLAN **c0** is an example of this type of customer VLAN. IPTV traffic is being carried on MVLAN **mv0**. If any host on any customer VLAN connected to port P4 requests an MVR stream, switch C takes the stream from VLAN **mv0** and replicates that stream onto port P4 with tag **mv0**. IPTV traffic, along with other network traffic, flows form port P4 out to the Digital Subscriber Line Access Multiplexer (DSLAM) **D1**.

Figure 3: MVR Topology in Transparent Mode

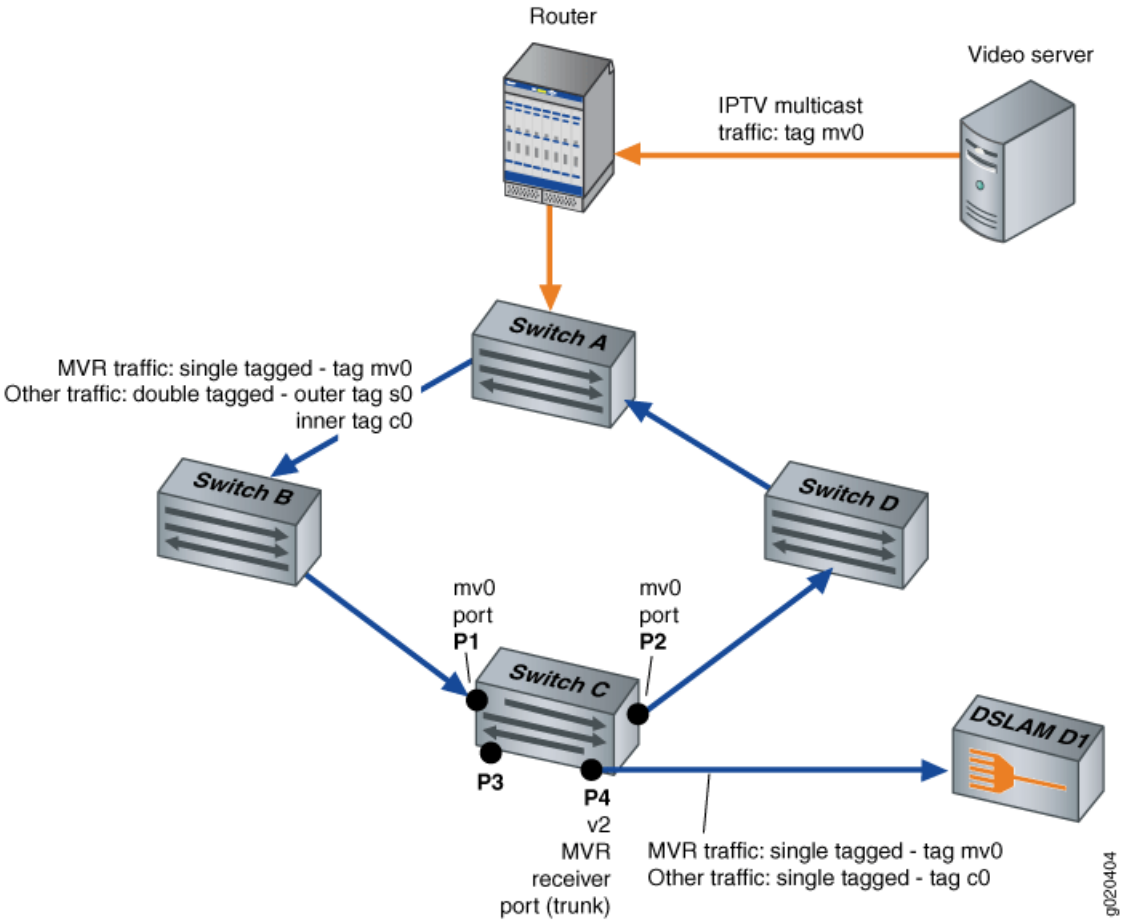
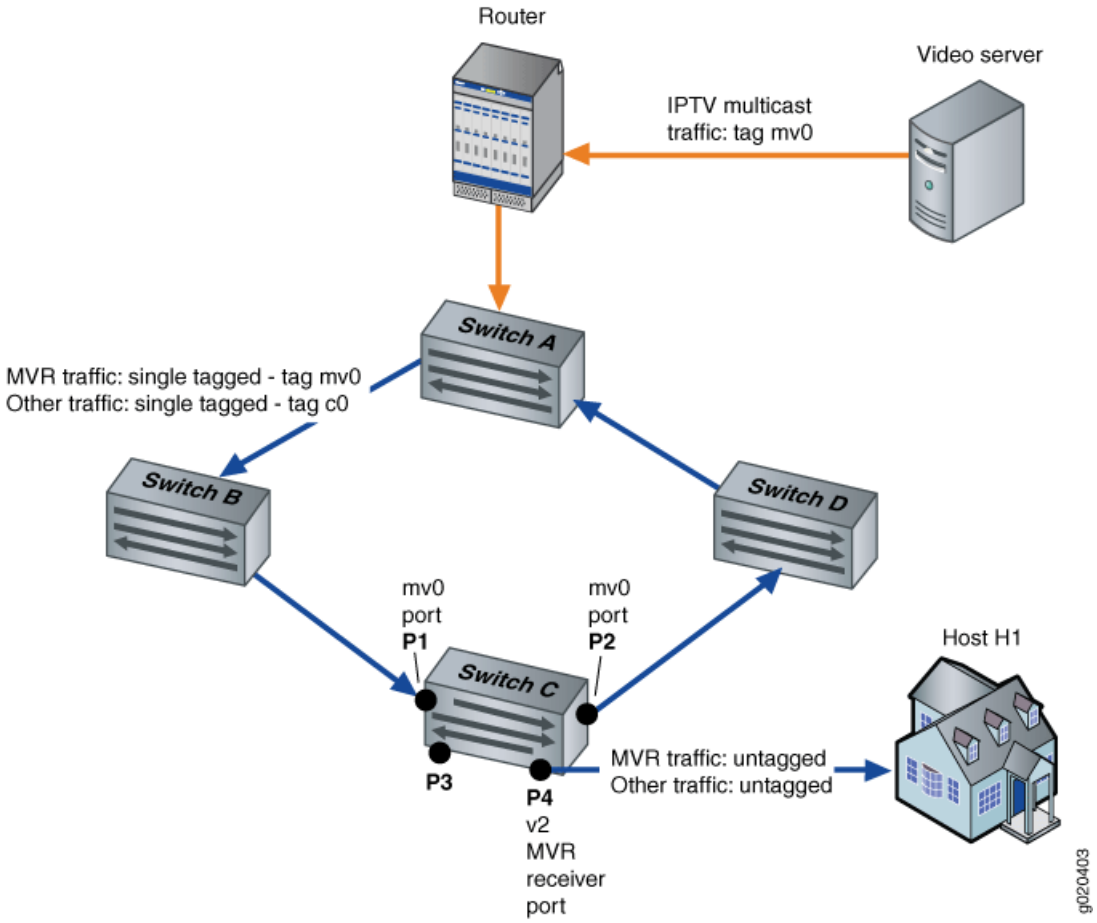


Figure 4 on page 17 shows the MVR topology in proxy mode. Interfaces P1 and P2 on switch C belong to MVLAN **mv0** and customer VLAN **c0**. Interface P4 on switch C is an access port of customer VLAN **c0**. In the upstream direction of the network, only non-IPTV traffic is being carried on customer VLAN **c0**. Any IPTV traffic requested by hosts on VLAN **c0** is replicated untagged to port P4 based on streams received in MVLAN **mv0**. IPTV traffic flows from port P4 out to an IPTV-enabled device in Host 1. Other traffic, such as data and voice traffic, also flows from port P4 to other network devices in Host 1.

Figure 4: MVR Topology in Proxy Mode



For information on VLAN tagging, see Understanding Bridging and VLANs on EX Series Switches.

Configuration

To configure MVR perform these tasks:

CLI Quick Configuration

To quickly configure MVR in proxy mode, copy the following commands and paste them into the switch terminal window. To quickly configure MVR in transparent mode (the default mode), do not copy and paste the final command line in the following block of lines:

```
[edit protocols igmp-snooping]
set vlan mv0 data-forwarding source groups 225.10.0.0/16
set vlan v2 data-forwarding receiver source-vlans mv0
set vlan v2 data-forwarding receiver install
set vlan mv0 proxy source-address 10.1.1.1
```

Step-by-Step Procedure

To configure MVR, perform these tasks:

1. Configure **mv0** to be an MVLAN:

```
[edit protocols igmp-snooping]
user@switch# set vlan mv0 data-forwarding source groups 225.10.0.0/16
```

2. Configure **v2** to be a multicast receiver VLAN with **mv0** as its source:

```
[edit protocols igmp-snooping]
user@switch# set vlan v2 data-forwarding receiver source-vlans mv0
```

3. (Optional) Install forwarding entries in the multicast receiver VLAN **v2**:

```
[edit protocols igmp-snooping]
user@switch# set vlan v2 data-forwarding receiver install
```

4. (Optional) Configure MVR in proxy mode:

```
[edit protocols igmp-snooping]
user@switch# set vlan mv0 proxy source-address 10.1.1.1
```

Results

Check the results of the configuration:

```
[edit protocols igmp-snooping]
user@switch# show
vlan mv0 {
  proxy {
    source-address 10.1.1.1;
  }
  data-forwarding {
    source {
      groups 225.10.0.0/16;
    }
  }
}
vlan v2 {
  data-forwarding {
    receiver {
      source-vlans mv0;
      install;
    }
  }
}
```

Related Documentation

- Configuring Multicast VLAN Registration (CLI Procedure) on page 24
- Understanding Multicast VLAN Registration on EX Series Switches on page 8

CHAPTER 3

Configuring IGMP Snooping and Multicast

Configuring IGMP Snooping (CLI Procedure)

IGMP snooping regulates multicast traffic in a switched network. With IGMP snooping enabled, a LAN switch monitors the IGMP transmissions between a host (a network device) and a multicast router, keeping track of the multicast groups and associated member ports. 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.

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

To enable IGMP snooping and configure individual options as needed for your network by using the CLI:

1. Enable IGMP snooping on a VLAN:

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

2. Configure the limit for the number of multicast groups allowed on the **ge-0/0/1** interface to 50.

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/1 group-limit
50
```

3. Configure the switch to immediately remove a group membership from an interface when it receives a leave message from that interface without waiting for any other IGMP messages to be exchanged (IGMPv2 only):

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

4. Statically configure IGMP group membership on a port:

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/3.0 static group
225.100.100.100
```

5. Statically configure an interface as a switching interface toward a multicast router (the interface to receive multicast traffic):

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan interface ge-0/0/2.0
multicast-router-interface
```

6. Change the number of timeout intervals the switch waits before timing out a multicast group to 4:

```
[edit protocols]
user@switch# set igmp-snooping vlan employee-vlan robust-count 4
```

Related Documentation

- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Changing the IGMP Snooping Group Query Membership Timeout Value (CLI Procedure) on page 23
- **show igmp-snooping membership on page 145**
- **show igmp-snooping route on page 147**
- **show igmp-snooping statistics on page 149**
- **show igmp-snooping vlans on page 151**
- IGMP Snooping on EX Series Switches Overview on page 3

Configuring IGMP Snooping (J-Web Procedure)

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 using the J-Web interface:

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

NOTE: After you make changes to the configuration in 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:
   - **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 21
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**.

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 (IGMPv2 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 (the interface to receive multicast traffic).	Click one: • Add—Adds an interface to the IGMP snooping configuration. 1. Select an 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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19
- Changing the IGMP Snooping Group Query Membership Timeout Value (CLI Procedure) on page 23
- IGMP Snooping on EX Series Switches Overview on page 3

Changing the IGMP Snooping Group Query Membership Timeout Value (CLI Procedure)

Generally, you do not need to explicitly set the group membership timeout value for IGMP snooping groups on an EX Series switch. The group membership timeout value, which determines how long the switch waits before removing an IGMP snooping group from its multicast cache table. is implicitly set to 260 seconds when you configure IGMP snooping.

When you enable IGMP snooping on a switch, the **query-interval** and **query-response-interval** values are set to their default values and are applied to all VLANs created on the switch. The default values are:

- **query-interval**—125 seconds
- **query-response-interval**—10 seconds

The software automatically calculates the group membership timeout value for an IGMP snooping-enabled switch by multiplying the **query-interval** value by 2 and then adding the **query-response-interval** value. For example, using the default values: (125 x 2) + 10) = 260.

If you need to explicitly set the group membership timeout value, you reset the **query-interval** and **query-response-interval** values at the **[edit protocols igmp]** hierarchy level. (Notice that you are not resetting the values at the **[edit protocols igmp-snooping]** hierarchy level.) When you reset these values, the IGMP snooping configuration inherits the new values and recalculates the group membership timeout value accordingly. For more information on changing these values, see the *Junos OS Multicast Protocols Configuration Guide*.

To change the IGMP snooping group membership timeout value to 350:

1. Configure the **query-interval** value to be 150:

```
[edit protocols]
user@switch# set igmp query-interval 150
```

2. Configure the **query-response-interval** value to be 50:

```
[edit protocols]
user@switch# set igmp query-response-interval 50
```

Related Documentation

- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Verifying That the IGMP Snooping Group Query Timeout Value Has Been Changed Correctly on page 26
- Configuring IGMP Snooping (CLI Procedure) on page 19
- Configuring IGMP Snooping (J-Web Procedure) on page 20

Configuring Multicast VLAN Registration (CLI Procedure)

Multicast VLAN registration (MVR) allows hosts that are not part of a multicast source VLAN (MVLAN) to still receive multicast streams from the MVLAN, allowing an MVLAN to be shared across a Layer 2 network. Hosts remain in their own VLANs for bandwidth and security reasons but are able to receive multicast streams from the MVLAN.

You can configure one or more VLANs on a switch to be MVLANs or MVR receiver VLANs. By default, MVR is not configured on EX Series switches.

NOTE: MVR is supported on VLANs running IGMP version 2 (IGMPv2) only.

NOTE: When configuring MVR, the following restrictions apply:

- You cannot enable multicast protocols on VLAN interfaces that are members of MVLANs.
- If you configure an MVLAN in proxy mode, IGMP snooping proxy mode will be automatically enabled on all MVR receiver VLANs of this MVLAN. If a VLAN is an MVR receiver VLAN for multiple MVLANs, all of the MVLANs must have proxy mode enabled or all must have proxy mode disabled. You can enable proxy mode only on VLANs that are configured as MVR source VLANs and that are not configured for Q-in-Q tunneling.
- After you configure a VLAN as an MVLAN, that VLAN is no longer available for other uses.

To configure MVR:

1. Configure the VLAN named **mv0** to be an MVLAN:

```
[edit protocols]
user@switch# set igmp-snooping vlan mv0 data-forwarding source groups 225.10.0.0/16
```

2. Configure the MVLAN **mv0** to be a proxy VLAN:

```
[edit protocols]
user@switch# set igmp-snooping vlan mv0 proxy source–address 10.0.0.1
```

3. Configure the VLAN named **v2** to be an MVR receiver VLAN:

```
[edit protocols]
user@switch# set igmp-snooping vlan v2 data-forwarding receiver source-vlans mv0
```

4. Install forwarding entries in the MVR receiver VLAN:

```
[edit protocols]
user@switch# set igmp-snooping vlan mv0 data-forwarding receiver install
```

Related Documentation

- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Understanding Multicast VLAN Registration on EX Series Switches on page 8

CHAPTER 4

Verifying IGMP Snooping and Multicast

Monitoring IGMP Snooping

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

Meaning Table 4 on page 25 summarizes the IGMP snooping details displayed.

Table 4: 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.
MRouters	Specifies the multicast router.
Receivers	Specifies the multicast receiver.
IGMP Route Information	

Table 4: Summary of IGMP Snooping Output Fields *(continued)*

Field	Values
VLAN	The VLAN for which IGMP snooping is enabled.
Group	Indicates the multicast groups learned by the VLAN.
Next-Hop	Specifies the next hop assigned by the switch after performing the route lookup.

Related Documentation

- **show igmp-snooping vlans on page 151**
- **show igmp-snooping statistics on page 149**
- **show igmp-snooping route on page 147**
- Configuring IGMP Snooping (CLI Procedure) on page 19
- Example: Configuring IGMP Snooping on EX Series Switches on page 11

Verifying That the IGMP Snooping Group Query Timeout Value Has Been Changed Correctly

Purpose Verify that the IGMP snooping group query timeout value has been changed correctly from its default value.

Action Display the IGMP protocol information:

```
user@switch> show configuration protocols igmp
query-interval 150;
query-response-interval 50;
accounting;
interface vlan.43 {
    version 2;
}
```

Display the IGMP snooping membership information, which contains the group query timeout value that was derived from the IGMP configuration:

```
user@switch> show show igmp-snooping membership detail
VLAN: v43 Tag: 43 (Index: 4)
      Group: 225.0.0.1
      Receiver count: 1, Flags: <v2-hosts>
          ge-0/0/15.0 Uptime: 00:00:05 timeout: 350
```

Meaning When you enable IGMP snooping on a switch, the **query-interval** and **query-response-interval** values are set to their default values and are applied to all VLANs created on the switch. The IGMP snooping group timeout value is derived from these default settings. Based on the default values, the initial IGMP snooping group query timeout value is 260.

To change the group query timeout value, change the **query-interval** and **query-response-interval** values at the **[edit protocols igmp]** hierarchy level. The IGMP snooping group query timeout value is then recalculated based on the new IGMP configuration settings.

The output from the **show protocols igmp** command shows the revised IGMP configuration settings for **query-interval** and **query-response-interval**. You know that these values have been revised because they are different from the default values. The output from the **show igmp-snooping membership detail** command shows the revised group query timeout value, **350**, which was derived from the new IGMP configuration settings.

Related Documentation

- Changing the IGMP Snooping Group Query Membership Timeout Value (CLI Procedure) on page 23

CHAPTER 5

Configuration Statements for IGMP Snooping and Multicast

[edit protocols] Configuration Statement Hierarchy

```
protocols {
  connections {
    remote-interface-switch connection-name {
      interface interface-name.unit-number;
      transmit-lsp label-switched-path;
      receive-lsp label-switched-path;
    }
  }
  dot1x {
    authenticator {
      authentication-profile-name profile-name;
      interface (all | [ interface-names ]) {
        disable;
        guest-vlan ( vlan-id | vlan-name);
        mac-radius <restrict>;
        maximum-requests number;
        no-reauthentication;
        quiet-period seconds;
        reauthentication {
          interval seconds;
        }
        retries number;
        server-fail (deny | permit | use-cache | vlan-id | vlan-name);
        server-reject-vlan (vlan-id | vlan-name);
        server-timeout seconds;
        supplicant (multiple | single | single-secure);
        supplicant-timeout seconds;
        transmit-period seconds;
      }
      static mac-address {
        interface interface-name;
        vlan-assignment (vlan-id |vlan-name);
      }
  }
  gvrp {
```

```
    <enable | disable>;
    interface (all | [interface-name]) {
      disable;
    }
    join-timer millseconds;
    leave-timer milliseconds;
    leaveall-timer milliseconds;
  }
  igmp-snooping {
    traceoptions {
      file filename <files number> <size size> <world-readable | no-world-readable>
        <match regex>;
      flag flag (detail | disable | receive | send);
    }
    vlan (vlan-id | vlan-number) {
      data-forwarding {
        source {
          groups group-prefix;
        }
        receiver {
          source-vlans vlan-list;
          install ;
        }
      }
      disable {
        interface interface-name
      }
      immediate-leave;
      interface interface-name {
        group-limit limit;
        multicast-router-interface;
        static (IGMP Snooping) {
          group ip-address;
        }
      }
      proxy ;
      query-interval seconds;
      query-last-member-interval seconds;
      query-response-interval seconds;
      robust-count number;
    }
  }
  lldp {
    disable;
    advertisement-interval seconds;
    hold-multiplier number;
    interface (all | interface-name) {
      disable;
    }
    lldp-configuration-notification-interval seconds;
    management-address ip-management-address;
    ptopo-configuration-maximum-hold-time seconds;
    ptopo-configuration-trap-interval seconds;
    traceoptions {
      file filename <files number> <size size> <world-readable | no-world-readable>
        <match regex>;
```

```
      flag flag (detail | disable | receive | send);
    }
  }
  lldp-med {
    disable;
    fast-start number;
    interface (all | interface-name) {
      disable;
      location {
        elin number;
        civic-based {
          what number;
          country-code code;
          ca-type {
            number {
              ca-value value;
            }
          }
        }
      }
    }
  }
  mpls {
    interface ( all | interface-name );
    label-switched-path lsp-name to remote-provider-edge-switch;
    path destination {
      <address | hostname> <strict | loose>
    }
  mstp {
    disable;
    bpdu-block-on-edge;
    bridge-priority priority;
    configuration-name name;
    forward-delay seconds;
    hello-time seconds;
    interface (all | interface-name) {
      disable;
      bpdu-timeout-action {
        block;
        log;
      }
      cost  cost;
      edge;
      mode mode;
      no-root-port;
      priority priority;
    }
    max-age seconds;
    max-hops hops;
    msti msti-id {
      vlan (vlan-id | vlan-name);
      interface interface-name {
        disable;
        cost  cost;
        edge;
        mode mode;
```

```
        priority priority;
      }
    }
    revision-level revision-level;
    traceoptions {
      file filename <files number > <size size> <no-stamp | world-readable |
        no-world-readable>;
      flag flag;
    }
  }
  mvrp {
    disable
    interface (all | interface-name) {
      disable;
      join-timer milliseconds;
      leave-timer milliseconds;
      leaveall-timer milliseconds;
      registration (forbidden | normal);
    }
    no-dynamic-vlan;
    traceoptions {
      file filename <files number > <size size> <no-stamp | world-readable |
        no-world-readable>;
      flag flag;
    }
  }
  oam {
    ethernet{
      connectivity-fault-management {
        action-profile profile-name {
          default-actions {
            interface-down;
          }
        }
        linktrace {
          age (30m | 10m | 1m | 30s | 10s);
          path-database-size path-database-size;
        }
        maintenance-domain domain-name {
          level number;
          mip-half-function (none | default |explicit);
          name-format (character-string | none | dns | mac+2oct);
          maintenance-association ma-name {
            continuity-check {
              hold-interval minutes;
              interval (10m | 10s | 1m | 1s| 100ms);
              loss-threshold number;
            }
            mep mep-id {
              auto-discovery;
              direction down;
              interface interface-name;
              remote-mep mep-id {
                action-profile profile-name;
              }
            }
```

```
            }
          }
        }
        link-fault-management {
          action-profile profile-name;
            action {
              syslog;
              link-down;
            }
            event {
              link-adjacency-loss;
              link-event-rate;
              frame-error count;
              frame-period count;
              frame-period-summary count;
              symbol-period count;
            }
            interface interface-name {
              link-discovery (active | passive);
              pdu-interval interval;
              event-thresholds threshold-value;
              remote-loopback;
              event-thresholds {
                frame-error count;
                frame-period count;
                frame-period-summary count;
                symbol-period count;
              }
            }
            negotiation-options {
              allow-remote-loopback;
              no-allow-link-events;
            }
        }
      }
    }
    rstp {
      disable;
      bpdu-block-on-edge;
      bridge-priority priority;
      forward-delay seconds;
      hello-time seconds;
      interface (all | interface-name) {
        disable;
        bpdu-timeout-action {
          block;
          log;
        }
        cost cost;
        edge;
        mode mode;
        no-root-port;
        priority priority;
      }
      max-age seconds;
      }
```

```
    traceoptions {
      file filename <files number > <size size> <no-stamp | world-readable |
        no-world-readable>;
      flag flag;
    }
  }
  sflow {
    agent-id;
    collector {
      ip-address;
      udp-port port-number;
    }
    disable;
    interfaces interface-name {
      disable;
      polling-interval seconds;
      sample-rate {
        egress number;
        ingress number;
      }
    }
    polling-interval seconds;
    sample-rate {
      egress number;
      ingress number;
    }
    source-ip;
  }
  stp {
    disable;
    bridge-priority priority;
    forward-delay seconds;
    hello-time seconds;
    interface (all | interface-name) {
      disable;
      bpdu-timeout-action {
        block;
        log;
      }
      cost  cost;
      edge;
      mode mode;
      no-root-port;
      priority priority;
    }
    max-age seconds;
  }
    traceoptions {
      file filename <files number > <size size> <no-stamp | world-readable |
        no-world-readable>;
      flag flag;
    }
  vstp {
    bpdu-block-on-edge;
    disable;
    force-version stp;
```

```
vlan (all | vlan-id | vlan-name) {
  bridge-priority priority;
  forward-delay seconds;
  hello-time seconds;
  interface (all | interface-name) {
    bpdu-timeout-action {
      log;
      block;
    }
    cost  cost;
    disable;
    edge;
    mode mode;
    no-root-port;
    priority priority;
  }
  max-age seconds;
  traceoptions {
    file filename <files number > <size size> <no-stamp | world-readable |
      no-world-readable>;
    flag flag;
  }
 }
 }
}
```

Related Documentation

- 802.1X for EX Series Switches Overview
- Example: Configure Automatic VLAN Administration Using GVRP
- Understanding Server Fail Fallback and Authentication on EX Series Switches
- IGMP Snooping on EX Series Switches Overview on page 3
- Understanding 802.1X and LLDP and LLDP-MED on EX Series Switches
- Understanding MSTP for EX Series Switches
- Understanding Multiple VLAN Registration Protocol (MVRP) on EX Series Switches
- Understanding Ethernet OAM Connectivity Fault Management for an EX Series Switch
- Understanding Ethernet OAM Link Fault Management for an EX Series Switch
- Understanding RSTP for EX Series Switches
- Understanding STP for EX Series Switches
- Understanding How to Use sFlow Technology for Network Monitoring on an EX Series Switch
- Understanding VSTP for EX Series Switches

accounting (Per 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.

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 (Protocol)

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.

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.

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.

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.

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.

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.

Description

Configure automatic RP announcement and discovery.

Options

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

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

mapping—Configures the routing device to announce, listens for and generates mapping packets, and announces 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.

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.

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 42**

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.

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 42**

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.

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 or IPv6

data-forwarding

Syntax

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

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number*]

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

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 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

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

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.

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

Syntax

```
disable {
    interface interface-name
}
```

Hierarchy Level

[edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

Release Information

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

Description

Disable IGMP snooping on all interfaces in a VLAN or on a specific VLAN interface.

Default

If you do not specify an interface, all interfaces in the given VLAN are disabled.

Options

interface-name —Name of the 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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

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.

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
- family (Disable PIM)

disable

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.

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

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.

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

Default No PIM DR election is performed on P2P 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.

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 89**

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.

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 (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.

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 (Bootstrap) on page 61**

family (Bootstrap)

Syntax

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

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.

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;
  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.

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

Syntax

```
graceful-restart {
    disable;
    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.

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

Syntax

group *ip-address*;

Hierarchy Level

[edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name* **interface** *interface-name* **static (IGMP Snooping)**]

Release Information

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

Description

Configure a static multicast group using a valid IP multicast address.

Default

None.

Options

ip-address —IP address of the multicast group receiving data on an 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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

group

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.

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-limit

Syntax group-limit *limit*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number* **interface** *interface-name*]

Release Information Statement introduced in Junos OS Release 9.5 for EX Series switches.

Description Configure a limit for the number of multicast groups allowed on the specified interface. After this limit is reached, new reports are ignored and related flows are not flooded on the interface.

Default No group limits are configured.

Options ***limit*** —Number that represents the maximum number of multicast groups allowed on the specified interface.

Range: 0 through 65535

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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19
- Configuring IGMP Snooping (J-Web Procedure) on page 20
- **group on page 52**

group-ranges

Syntax

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

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 protocols **pim rp local family** (inet | inet6)],
[edit protocols **pim rp static** 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.

Description

Configure the address ranges of the multicast groups for which this routing device can be an 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-mask—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
- Configuring PIM Embedded RP for IPv6

groups

Syntax groups *group-prefix*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number* **data-forwarding source**]

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

Description Specify the IP address range of the multicast VLAN (MVLAN) source interfaces.

Default Disabled.

Options ***group-prefix***—IP address range of the source group. Each MVLAN must have exactly one **groups** statement. If there are multiple MVLANs on the switch, their group ranges must be unique.

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

Related Documentation

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

hello-interval

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.

Description Specify how often the router 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

- Modifying the PIM Hello Interval
- **hold-time on page 57**

hold-time

Syntax hold-time *seconds*;

Hierarchy Level [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.

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: 0 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

igmp-snooping

Syntax

```
igmp-snooping {
  traceoptions {
    file filename <files number> <size size> <world-readable | no-world-readable> <match
      regex>;
    flag flag (detail | disable | receive | send);
  }
  vlan vlan-id | vlan-name {
    data-forwarding {
      source {
        groups group-prefix;
      }
      receiver {
        source-vlans vlan-list;
        install ;
      }
    }
    disable {
      interface interface-name;
    }
    immediate-leave;
    interface interface-name {
      group-limit limit;
      multicast-router-interface;
      static (IGMP Snooping) {
        group ip-address;
      }
    }
    proxy ;
    query-interval seconds;
    query-last-member-interval seconds;
    query-response-interval seconds;
    robust-count number;
  }
}
```

Hierarchy Level [edit protocols]

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

Description Enable and configure IGMP snooping on EX Series switches.

The remaining statements are explained separately.

Default IGMP snooping is enabled by default.

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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

immediate-leave

Syntax immediate-leave;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

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

Description (Applies only to switches running IGMPv2.) After the switch receives a leave group membership message from a host, immediately remove the group membership from the interface without waiting for any other IGMP messages to be exchanged.

NOTE: When configuring this statement, ensure that the IGMP interface has only one IGMP host connected. If more than one IGMPv2 host is connected to the switch through the same interface and one of the hosts sends a leave message, the switch removes all hosts on the interface from the multicast group. The switch loses contact with the hosts in the multicast group that did not send a leave message until they send join requests in response to the next general multicast listener query from the router.

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 on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

immediate-leave

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.

Description When this statement is enabled on a routing device running IGMP version 2 (IGMPv2), after the routing device receives a leave group membership message from a host associated with the interface, the routing device immediately removes the group membership from the interface and suppresses the sending of any group-specific queries for the multicast group.

When this statement is enabled on a routing device running IGMP version 3 (IGMPv3), after the routing device receives a report with the type BLOCK_OLD_SOURCES, the routing device suppresses the sending of group-and-source queries but relies on the Junos OS-supported host tracking mechanism to determine whether or not it removes a particular source group membership from the interface.

NOTE: When issuing this command on IGMPv2 interfaces, ensure that the IGMP interface has only one IGMP host connected. If more than one IGMPv2 host is connected to a LAN through the same interface, and one host sends a done message, the routing device removes all hosts on the interface from the multicast group. The routing device loses contact with the hosts that properly remain in the multicast group until they send join requests in response to the next general multicast listener query from the router.

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

import (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.

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 (Bootstrap) on page 49**

import (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.

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 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.

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

install

Syntax install;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number* **data-forwarding receiver**]

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

Description Install forwarding entries in the multicast receiver VLAN. By default, only the multicast VLAN (MVLAN) installs forwarding entries for MVLAN groups.

Default Disabled.

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

Related Documentation
- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

interface

Syntax

```
interface (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;
    version (0 | 1 | automatic);
  }
  family (inet | inet6) {
    disable;
  }
  hello-interval seconds;
  mode (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**. For details about specifying interfaces, see the *Junos OS Network Interfaces Configuration Guide*.

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 Mode-Independent Configuration Overview

interface

Syntax

```
interface interface-name {
  group-limit limit;
  multicast-router-interface;
  static (IGMP Snooping) {
    group ip-address;
  }
}
```

Hierarchy Level [edit protocols igmp-snooping vlan *vlan-id* | *vlan-name*]

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

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

The remaining statements are explained separately.

Default None.

Options ***interface-name***—Name of the interface.

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

Related Documentation
- **show igmp-snooping vlans on page 151**
- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

interface

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;
  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.

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**. For details about specifying interfaces, see the *Junos OS Network Interfaces Configuration Guide*.

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;

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.

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

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

Related Documentation
- Configuring PIM Join Load Balancing
- clear pim join-distribution in the *Protocols Command Reference*

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;
    priority number;
  }
  group-ranges {
    destination-ip-prefix</prefix-length>;
  }
  hold-time seconds;
  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.
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

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.

Description Configure the routing device's local address for 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.

Description Configure the routing device's 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.

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

Syntax mode (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.

Description Configure PIM to operate in sparse, dense, or sparse-dense mode.

Options **dense**—Operate in dense mode.

sparse—Operate in sparse mode.

sparse-dense—Operate in sparse-dense mode.

Default: sparse

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
- Configuring PIM Sparse-Dense Mode Properties

multicast-router-interface

Syntax multicast-router-interface;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name* **interface** *interface-name*]

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

Description Statically configure an interface as a switching interface toward a multicast router (the interface to receive multicast traffic).

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 IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

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.

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

Options ***policy-name***—Name of the policy that filters neighbor IP addresses. For details about configuring policy statements, see the *Junos OS Policy Framework Configuration Guide*.

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;
    restart-duration seconds;
  }
  import [ policy-names ];
  interface interface-name {
    accept-remote-source;
    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;
      version (0 | 1 | automatic);
    }
    family (inet | inet6) {
      disable;
    }
    hello-interval seconds;
    mode (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;
  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);
  }
  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;
  }
  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;
      priority number;
    }
  }
  rp-register-policy [ policy-names ];
  spt-threshold {
    infinity [ policy-names ];
  }
  static {
    address address {
      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;
        }
      }
    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 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

- Configuring PIM Dense Mode Properties

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.

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 43**

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.

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: 1 through a 32-bit number

Default: 1 (The routing device has the least likelihood of becoming the designated router.)

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 to Become the PIM Designated Router

priority (PIM RPs)

Syntax priority *number*;

Hierarchy Level [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.

Description Configure this routing device's priority for becoming an RP. The bootstrap router uses this field when selecting the list of candidate RPs to send in the bootstrap message. A smaller number increases the likelihood that the routing device becomes the RP for local multicast groups. A priority value of 0 means that bootstrap router can override the group range being advertised by the candidate RP.

Options *number*—Routing device's 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

promiscuous-mode

Syntax promiscuous-mode;

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.

Description Specify that the interface accepts IGMP reports from hosts on any subnetwork.

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

Related Documentation
- Accepting IGMP Messages from Remote Subnetworks

proxy

Syntax proxy source-address *source-address*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number*]

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

Description Specify that the VLAN operates in proxy mode. The proxy option is only accepted for a VLAN acting as a data-forwarding source.

Default Disabled.

Options **source-address *source-address***—IP address of the source VLAN to act as proxy.

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

Related Documentation

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

query-interval

Syntax query-interval *seconds*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement deprecated in Junos OS Release 9.4 for EX Series switches.

NOTE: This statement has been deprecated and might be removed from future product releases. We strongly recommend that you phase out its use.

Description Configure how frequently the switch sends host-query timeout messages to a multicast group.

Default 125 seconds.

Options ***seconds***—Number of seconds between host-query timeout messages.
Range: 1 through 1024 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 IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

query-interval

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.

Description Specify how often the querier router 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 on page 83**
- **query-response-interval on page 85**

query-last-member-interval

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

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement deprecated in Junos OS Release 9.4 for EX Series switches.

NOTE: This statement has been deprecated and might be removed from future product releases. We strongly recommend that you phase out its use.

Description Configure the interval between group-specific query timeout messages sent by the switch.

Default 1 second.

Options ***seconds***—Amount of time between group-specific query timeout messages.
Range: 1 though 1024 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 IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

query-last-member-interval

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.

Description Specify how often the querier router 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 1024

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 on page 81**
- **query-response-interval on page 85**

query-response-interval

Syntax query-response-interval *seconds*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

Release Information Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement deprecated in Junos OS Release 9.4 for EX Series switches.

NOTE: This statement has been deprecated and might be removed from future product releases. We strongly recommend that you phase out its use.

Description Configure the length of time the switch waits to receive a response to a specific query message from a host.

Default 10 seconds.

Options ***seconds*** —Number of seconds the switch waits to receive a response to a specific query message from a host.

Range: 1 through 25 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 IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

query-response-interval

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.

Description Specify how long the querier router 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 on page 81**
- **query-last-member-interval on page 83**

receiver

Syntax

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

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-number* **data-forwarding**]

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

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

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

restart-duration

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.

Description Configure the duration of the graceful restart interval.

Options ***seconds***—Time 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

Syntax rib-group *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.

Description Associate a routing table group with PIM.

Options ***group-name***—Name of the routing table group. The name must be one that you defined with the **rib-group** 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
- Configuring a PIM RPF Routing Table

robust-count

Syntax robust-count *number*;

Hierarchy Level [edit protocols **igmp-snooping vlan** *vlan-id* | *vlan-name*]

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

Description Configure the number of intervals the switch waits before removing a multicast group from the multicast forwarding table. The length of each interval is configured using the **query-interval** statement.

Default 2

Options ***number*** —Number of intervals the switch waits 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
- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

robust-count

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.

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

```
rp {
    auto-rp {
        (announce | discovery | mapping);
        (mapping-agent-election | no-mapping-agent-election);
    }
    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;
    }
    local {
        family (inet | inet6) {
            disable;
            address address;
            anycast-pim {
                rp-set {
                    address address <forward-msdp-sa>;
                }
                local-address address;
            }
            group-ranges {
                destination-ip-prefix</prefix-length>;
            }
            hold-time seconds;
            priority number;
        }
    }
    rp-register-policy [ policy-names ];
    static {
        address address {
            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.

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
- PIM Sparse Mode Overview

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.

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 48**

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.

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

Syntax

```
source {
    groups group-prefix;
}
```

Hierarchy Level

[edit protocols **igmp-snooping vlan** *vlan-number* **data-forwarding**]

Release Information

Statement introduced in Junos OS Release 9.6 for EX Series switches.

Description

Configure a VLAN to be a multicast source VLAN (MVLAN).

The remaining statement is 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

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

source

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.

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** *vlan-id* | *vlan-number* **data-forwarding receiver**]

Release Information

Statement introduced in Junos OS Release 9.6 for EX Series switches.

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

- [edit protocols] Configuration Statement Hierarchy on page 29
- Example: Configuring Multicast VLAN Registration on EX Series Switches on page 14
- Configuring Multicast VLAN Registration (CLI Procedure) on page 24

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.

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

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.

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

Syntax

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

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 (IGMP Snooping)

Syntax

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

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

- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

static

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.

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

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

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.

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
- **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

traceoptions

Syntax

```
traceoptions {
  file filename <files number> <size size> <world-readable | no-world-readable> <match
    regex>;
  flag flag (detail | disable | receive | send);
}
```

Hierarchy Level [edit protocols igmp-snooping]

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

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. 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 (***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify gigabytes), at which point the oldest trace file is overwritten. 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: 3 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.
- **leave**—Trace leave group messages (IGMPv2 only).
- **normal**—Trace normal IGMP snooping protocol events.
- **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.

match *regex* —(Optional) Refine the output to include lines that contain the regular expression.

no-world-readable—(Optional) Restricted file access to the user who created the 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 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 also must specify a maximum file size with the **files** option.

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

Range: 10 KB through 1 gigabytes

Default: 128 KB

world-readable—(Optional) Enable 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

- Example: Configuring IGMP Snooping on EX Series Switches on page 11
- Configuring IGMP Snooping (CLI Procedure) on page 19

traceoptions

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.

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, as described in the *Junos OS System Basics and Services Command Reference*.

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

version

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.

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 (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.

Description Specify the version of PIM.

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

Range: 1 or 2

Default: PIM 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 PIM Version

vlan

Syntax

```
vlan (vlan-id | vlan-name) {
  data-forwarding {
    source {
      groups group-prefix;
    }
    receiver {
      source-vlans vlan-list;
      install ;
    }
  }
  disable {
    interface interface-name;
  }
  immediate-leave;
  interface interface-name {
    group-limit limit;
    multicast-router-interface;
    static (IGMP Snooping) {
      group ip-address;
    }
  }
  proxy ;
  query-interval seconds;
  query-last-member-interval seconds;
  query-response-interval seconds;
  robust-count number;
}
```

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.

The remaining statements are explained separately.

TIP: To display a list of all configured VLANs on the system, including VLANs that are configured but not committed, type ? after vlan or vlans in your configuration mode command line. Note that only one VLAN is displayed for a VLAN range. For IGMP snooping, secondary private VLANs are not listed.

Default IGMP snooping options apply to the specified VLAN.

Options ***vlan-id***—Numeric tag for a VLAN.

Range: 0 through 4095. Tags 0 and 4095 are reserved by Junos OS, and you should not configure them.

vlan-name—Name of a 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) on page 19
- IGMP Snooping on EX Series Switches Overview on page 3

CHAPTER 6

Operational Commands for IGMP Snooping and Multicast

clear igmp membership

Syntax

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

Syntax (EX Series Switch)

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.

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 135
- **show igmp interface** on page 139

List of Sample Output

clear igmp membership on page 108
clear igmp membership interface on page 109
clear igmp membership group on page 109

Output Fields

See **show igmp group** for an explanation of output fields.

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

Syntax

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

Syntax (EX Series Switch)

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.

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 142**

List of Sample Output

clear igmp statistics on page 112

Output Fields

See **show igmp statistics** for an explanation of output fields.

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-id* | *vlan-name*>

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

Description Clear IGMP snooping membership information.

Options vlan *vlan-id* —Numeric tag identifier of the VLAN.

vlan *vlan-name* —Name of the VLAN.

Required Privilege Level view

Related Documentation
- show igmp-snooping membership on page 145

List of Sample Output clear igmp-snooping membership on page 114

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 149

List of Sample Output clear igmp-snooping statistics on page 115

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.

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 155**

List of Sample Output clear multicast bandwidth-admission on page 117

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

clear multicast bandwidth-admission

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

clear multicast scope

Syntax

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

Syntax (EX Series Switch)

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.

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 173**

List of Sample Output

clear multicast scope on page 118

Output Fields

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

clear multicast scope

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

clear multicast sessions

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

Syntax (EX Series Switch)
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.

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 175**

List of Sample Output
clear multicast sessions on page 119

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

clear multicast sessions
```
user@host> clear multicast sessions
```

clear multicast statistics

Syntax

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

Syntax (EX Series Switch)

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.

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 120

Output Fields

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

clear multicast statistics

```
user@host> clear multicast statistics
```

clear pim join

Syntax

clear pim join
<*group-address*>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

clear pim join
<*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.

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.

inet | inet6—(Optional) Clear the PIM join and prune states for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Clear the join and prune states 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.

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 185**

List of Sample Output

clear pim join on page 121

Output Fields

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

clear pim join

```
user@host> clear pim join
```

clear pim register

Syntax

clear pim register
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

clear pim register
<inet | inet6>
<instance *instance-name*>
<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 and **instance** options introduced in Junos OS Release 10.0 for EX Series switches.

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 202**

List of Sample Output

clear pim register on page 122

Output Fields

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

clear pim register

```
user@host> clear pim register
```

clear pim statistics

Syntax

clear pim statistics
<inet | inet6>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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 202**

List of Sample Output

clear pim statistics on page 123

Output Fields

See **show pim statistics** for an explanation of output fields.

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*
<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.

Description
Display trace information about an IP multicast path.

Options
source—Source hostname or address.

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 126

Output Fields
Table 5 on page 125 describes the output fields for the **mtrace** command. Output fields are listed in the approximate order in which they appear.

Table 5: 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.
protocol	Protocol used (for example, PIM).
Round trip time	Average round-trip time, in milliseconds (ms).
total ttl of	Time-to-live (TTL) threshold.

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.

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, the 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 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 129**

Output Fields Table 6 on page 128 describes the output fields for the **mtrace from-source** command. Output fields are listed in the approximate order in which they appear.

Table 6: 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.
Packet Statistics for Traffic From	Number of packets lost, number of packets sent, percentage of packets lost, and average packet rate at each hop.

Table 6: mtrace from-source Output Fields *(continued)*

Field Name	Field Description
Receiver	IP address receiving the multicast.
Query source	IP address sending the mtrace query.

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.

Description Listen passively for IP multicast responses.To exit **mtrace monitor**, type Ctrl+c.

Options none—Trace the master instance.

Required Privilege Level view

List of Sample Output **mtrace monitor on page 131**

Output Fields Table 7 on page 130 describes the output fields for the **mtrace monitor** command. Output fields are listed in the approximate order in which they appear.

Table 7: 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.

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.

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 133**

Output Fields Table 8 on page 133 describes the output fields for the **mtrace to-gateway** command. Output fields are listed in the approximate order in which they appear.

Table 8: 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.

mtrace to-gateway

```
user@host> mtrace to-gateway gateway 192.1.3.2 group 225.1.1.1 interface 192.1.1.73 brief

Mrace 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

Syntax
show igmp group
<brief | detail>
<*group-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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.

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 108**

List of Sample Output
show igmp group (Include Mode) on page 136
show igmp group (Exclude Mode) on page 137
show igmp group brief on page 137
show igmp group detail on page 137

Output Fields
Table 9 on page 135 describes the output fields for the **show igmp group** command. Output fields are listed in the approximate order in which they appear.

Table 9: 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
Source	Source address.	All levels

Table 9: show igmp group Output Fields *(continued)*

Field Name	Field Description	Level of Output
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

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

Syntax
show igmp interface
<brief | detail>
<*interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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.

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 108**

List of Sample Output
show igmp interface on page 141
show igmp interface brief on page 141
show igmp interface detail on page 141

Output Fields
Table 10 on page 139 describes the output fields for the **show igmp interface** command. Output fields are listed in the approximate order in which they appear.

Table 10: show igmp interface Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface.	All levels
State	State of the interface: **Up** or **Down**.	All levels
Querier	Address of the routing device that has been elected to send membership queries.	All levels
Timeout	How long until the IGMP querier is declared to be unreachable, in seconds.	All levels

Table 10: show igmp interface Output Fields *(continued)*

Field Name	Field Description	Level of Output
Version	IGMP version being used on the interface: **1** , **2** , or **3**.	All levels
Groups	Number of groups on the interface.	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
OIF map	Name of the OIF map associated to 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

Table 10: show igmp interface Output Fields *(continued)*

Field Name	Field Description	Level of Output
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

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
Interface: so-1/0/0.0
    Querier: 10.111.10.1
    State:         Up Timeout:    None Version:  2 Groups:      2
Interface: so-1/0/1.0
    Querier: 10.111.20.1
    State:         Up Timeout:    None Version:  2 Groups:      4
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 141**.

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 141**.

show igmp statistics

Syntax
show igmp statistics
<brief | detail>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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.

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 112**

List of Sample Output
show igmp statistics on page 143
show igmp statistics interface on page 144

Output Fields
Table 11 on page 142 describes the output fields for the **show igmp statistics** command. Output fields are listed in the approximate order in which they appear.

Table 11: 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 11: 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.

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 IGMP snooping membership information.

Options

none—Display general parameters.

brief | **detail**—(Optional) Display the specified level of output.

interface *interface-name*—(Optional) Display IGMP snooping information for the specified interface.

vlan *vlan-id* | *vlan-name*—(Optional) Display IGMP snooping information for the specified VLAN.

Required Privilege Level

view

Related Documentation

- **show igmp-snooping route on page 147**
- **show igmp-snooping statistics on page 149**
- **show igmp-snooping vlans on page 151**
- Monitoring IGMP Snooping on page 25
- Configuring IGMP Snooping (CLI Procedure) on page 19
- Configuring IGMP Snooping (J-Web Procedure) on page 20

List of Sample Output

show igmp-snooping membership on page 146
show igmp-snooping membership detail on page 146

Output Fields

Table 12 on page 145 lists the output fields for the **show igmp-snooping membership** command. Output fields are listed in the approximate order in which they appear.

Table 12: 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 12: 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. For dynamic interfaces, amount of time since the first query was received on interface. • **timeout**—Query timeout in seconds.	**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. • **timeout**—Time (in seconds) left until the entry for the multicast group is removed. • **Last reporter**—Last host to report membership for the multicast group. • **Receiver count**—Number of interfaces that have membership in a multicast group. • **Flags**—IGMP version of the host sending a join message. • **Include source**—Source addresses from which multicast streams are allowed based on IGMPv3 reports. Shown only for IGMPv3 joins.	**detail**

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: vlan24 Tag: 24 (Index: 3)
  Router interfaces:
    ge-0/0/8.0 dynamic Uptime: 00:08:35 timeout: 254
  Group: 224.1.1.1
    ge-0/0/0.0 timeout: 223 Receiver count: 1, Flags: <V2-hosts Static>
  Group: 224.1.1.100
    ge-0/0/0.0 timeout: 170 Last reporter: 10.10.1.10 Receiver count: 1, Flags:
    <V2-hosts>
  Group: 225.1.1.100
    ge-0/0/0.0 timeout: 168 Last reporter: 10.10.1.10 Receiver count: 1, Flags:
    <V2-hosts>
```

show igmp-snooping route

Syntax

show igmp-snooping route
<**brief** | **detail**>
<**ethernet-switching** <**brief** | **detail** | **vlan** (*vlan-id* | *vlan-name*)>>
<**inet** <**brief** | **detail** | **vlan** (*vlan-id* | *vlan-name*)>>
<**vlan** *vlan-id* | *vlan-name*>

Release Information

Command introduced in Junos OS Release 9.1 for EX Series switches.
Option **inet** enhanced to support IPv6 multicast groups in Junos OS Release 10.2 for EX Series switches.

Description

Display IGMP snooping route information.

Options

none—Display general parameters.

brief | **detail**—(Optional) Display the specified level of output.

ethernet-switching—(Optional) Display Ethernet switching information.

inet—(Optional) Display **inet** information for IPv4 and IPv6 multicast groups. For Layer 3 IPv6 multicast routes, display information about the routing table, the routing next hop, and the Layer 2 next hop.

vlan *vlan-id* | *vlan-name*—(Optional) Display route information for the specified VLAN.

Required Privilege Level

view

Related Documentation

- **show igmp-snooping statistics on page 149**
- **show igmp-snooping vlans on page 151**

List of Sample Output

show igmp-snooping route on page 148
show igmp-snooping route inet detail (IPv6 Multicast Route) on page 148
show igmp-snooping route vlan v1 on page 148

Output Fields

Table 13 on page 147 lists the output fields for the **show igmp-snooping route** command. Output fields are listed in the approximate order in which they appear.

Table 13: show igmp-snooping route Output Fields

Field Name	Field Description
Table	(For internal use only. Value is always 0.)
Routing Table	(For internal use only. Value is always 0.)
VLAN	Name of the VLAN on which IGMP snooping is enabled.
Group	Multicast IPv4 or IPv6 group address.

Table 13: 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.

show igmp-snooping route

```
user@switch> show igmp-snooping route
VLAN             Group          Next-hop
V11              224.1.1.1, *        533
        Interfaces: ge-0/0/13.0, ge-0/0/1.0
VLAN             Group          Next-hop
v12              224.1.1.3, *        534
        Interfaces: ge-0/0/13.0, ge-0/0/0.0
```

show igmp-snooping route inet detail (IPv6 Multicast Route)

```
user@switch> show igmp-snooping route inet detail
Routing table: 0
Group: ff0e::1:ff05:1a3d, 2001::ee0:81ff:ee05:1a2e
    Routing next-hop: 587
        vlan.42
    Interface: vlan.42, VLAN: v42, Layer 2 next-hop: 506
```

show igmp-snooping route vlan v1

```
user@switch> show igmp-snooping route vlan v1
Table: 0
VLAN             Group          Next-hop
v1               224.1.1.1, *       1266
        Interfaces: ge-0/0/0.0
v1               224.1.1.3, *       1266
        Interfaces: ge-0/0/0.0
v1               224.1.1.5, *       1266
        Interfaces: ge-0/0/0.0
v1               224.1.1.7, *       1266
        Interfaces: ge-0/0/0.0
v1               224.1.1.9, *       1266
        Interfaces: ge-0/0/0.0
v1               224.1.1.11, *      1266
        Interfaces: ge-0/0/0.0
```

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
- **show igmp-snooping route on page 147**
- **show igmp-snooping vlans on page 151**

List of Sample Output **show igmp-snooping statistics on page 149**

Output Fields Table 14 on page 149 lists the output fields for the **show igmp-snooping statistics** command. Output fields are listed in the approximate order in which they appear.

Table 14: 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.
Receive unknown	Unknown IGMP type.
Timed out	Number of timeouts for all multicast groups.
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 general receive errors.

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: 58

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

```
Leaves:                  0               0               0
Other:                   0               0               0
```

show igmp-snooping vlans

Syntax
show igmp-snooping vlans
<**brief** | **detail**>
<**vlan** ***vlan-id*** | *vlan-name*>

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

Description
Display IGMP snooping VLAN information.

Options
none—Display general parameters.

brief | **detail**—(Optional) Display the specified level of output.

vlan ***vlan-id*** | **vlan** ***vlan-number***—(Optional) Display VLAN information for the specified VLAN.

Required Privilege Level
view

Related Documentation
- **show igmp-snooping route on page 147**
- **show igmp-snooping statistics on page 149**

List of Sample Output
show igmp-snooping vlans on page 152
show igmp-snooping vlans vlan v10 on page 152
show igmp-snooping vlans vlan v10 detail on page 152

Output Fields
Table 15 on page 151 lists the output fields for the **show igmp-snooping vlans** command. Output fields are listed in the approximate order in which they appear.

Table 15: show igmp-snooping vlans Output Fields

Field Name	Field Description	Level of Output
VLAN	Name of the VLAN.	All levels
Interfaces	Number of interfaces in the VLAN.	All levels
Groups	Number of groups in the VLAN	All levels
MRouters	Number of multicast routers associated with the VLAN.	All levels
Receivers	Number of host receivers in the VLAN.	All levels
Tag	Numerical identifier of the VLAN.	Detail
vlan-interface	Internal VLAN interface identifier.	Detail
Membership timeout	Membership timeout value.	Detail

Table 15: show igmp-snooping vlans Output Fields *(continued)*

Field Name	Field Description	Level of Output
Querier timeout	Timeout value for interfaces dynamically marked as router interfaces (interfaces that receive queries). When the querier timeout is reached, the switch marks the interface as a host interface.	Detail
Interface	Name of the interface.	Detail
Reporters	Number of dynamic groups on an interface.	Detail

show igmp-snooping vlans

```
user@switch> show igmp-snooping vlans
VLAN     Interfaces Groups MRouters Receivers
default                                   0      0        0         0
v1                                       11     50        0         0
v10                                       1      0        0         0
v11                                       1      0        0         0
v180                                      3      0        1         0
v181                                      3      0        0         0
v182                                      3      0        0         0
```

show igmp-snooping vlans vlan v10

```
user@switch> show igmp-snooping vlans vlan v10
user@switch> show igmp-snooping vlans vlan v10
VLAN                                 Interfaces Groups MRouters Receivers
v10                                           1      0        0         0
```

show igmp-snooping vlans vlan v10 detail

```
user@switch> show igmp-snooping vlans vlan v10 detail
VLAN: v10, Tag: 10, vlan-interface: vlan.10
Membership timeout: 260, Querier timeout: 255
        Interface: ge-0/0/10.0, tagged, Groups: 0, Reporters: 0
```

show multicast flow-map

Syntax
show multicast flow-map
<brief | detail>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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.

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 154
show multicast flow-map detail on page 154

Output Fields
Table 16 on page 153 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 to 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**
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**

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
```

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

Syntax
show multicast interface
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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.

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 156

Output Fields
Table 17 on page 155 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.
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.

Table 17: show multicast interface Output Fields *(continued)*

Field Name	Field Description
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.

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.

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 158**

Output Fields Table 18 on page 157 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.

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

Syntax

show multicast next-hops
<brief | detail>
<*identifier-number*>
<inet | inet6>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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.

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 160
show multicast next-hops brief on page 160
show multicast next-hops detail on page 160

Output Fields

Table 19 on page 159 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
ID	Next-hop identifier of the prefix. The identifier is returned by the routing device's Packet Forwarding Engine.
Refcnt	Number of cache entries that are using this next hop.
KRefcount	Kernel reference count for the next hop.

Table 19: show multicast next-hops Output Fields *(continued)*

Field Name	Field Description
Downstream interface	Interface names associated with each multicast next-hop ID.

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

Family: INET6
```

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 160**.

show multicast next-hops detail

The output for the **show multicast next-hops detail** command is identical to that for the **show multicast next-hops** command. For sample output, see **show multicast next-hops on page 160**.

show multicast pim-to-igmp-proxy

Syntax
show multicast pim-to-igmp-proxy
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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 10.0.
instance option introduced in Junos OS Release 10.0 for EX Series switches.

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

List of Sample Output
show multicast pim-to-igmp-proxy on page 161
show multicast pim-to-igmp-proxy instance on page 162

Output Fields
Table 20 on page 161 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
Proxy state	State of PIM-to-IGMP message translation, also known as PIM-to-IGMP proxy, on the configured upstream interfaces: **enabled** or **disabled**.
interface-name	Name of upstream interface (no more than two allowed) on which PIM-to-IGMP message translation is configured.

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

Syntax
show multicast pim-to-mld-proxy
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
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 10.0.
instance option introduced in Junos OS Release 10.0 for EX Series switches.

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 163
show multicast pim-to-mld-proxy instance on page 164

Output Fields
Table 21 on page 163 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.

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

Syntax

show multicast route
<brief | detail | extensive>
<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)

show multicast route
<brief | detail | extensive>
<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.

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—(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-style regular expression.

source-prefix *source-prefix*—(Optional) Display the cache entries for a particular source prefix.

Required Privilege Level view

List of Sample Output
show multicast route on page 167
show multicast route brief on page 167
show multicast route detail on page 167
show multicast route extensive on page 168

Output Fields Table 22 on page 166 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
Address family	IPv4 address family (**INET**) or IPv6 address family (**INET6**).	All levels
Group	Group address.	All levels
Source	Prefix and length of the source as it is in the multicast forwarding table.	All levels
Upstream interface	Name of the interface on which the packet with this source prefix is expected to arrive.	All levels
Downstream interface list	List of interface names to which the packet with this source prefix is forwarded.	All levels
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**.	**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**
Upstream protocol	Protocol running on the interface on which the packet with this source prefix is expected to arrive.	**detail extensive**
Route state	Whether the group is **Active** or **Inactive**.	**extensive**
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.	**extensive**
Wrong incoming interface notifications	Number of times that the upstream interface was not available.	**extensive**

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-1/1/0.49152

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 167**.

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-1/1/0.49152
    Session description: Administratively Scoped
    Statistics: 0 kBps, 0 pps, 38 packets
    Next-hop ID: 262143
    Upstream protocol: PIM

Family: INET6
```

show multicast route extensive

```
user@host> show multicast route extensive
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, 46454 packets
    Next-hop ID: 262142
    Upstream protocol: PIM
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: 360 seconds
    Wrong incoming interface notifications: 0

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
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: 348 seconds
    Wrong incoming interface notifications: 0

Group: 239.1.1.1
    Source: 10.255.70.15/32
    Upstream interface: so-1/0/0.0
    Downstream interface list:
        mt-1/1/0.49152
    Session description: Administratively Scoped
    Statistics: 0 kBps, 0 pps, 40 packets
    Next-hop ID: 262143
    Upstream protocol: PIM
    Route state: Active
    Forwarding state: Forwarding
    Cache lifetime/timeout: 360 seconds
    Wrong incoming interface notifications: 1

Family: INET6
```

show multicast rpf

Syntax

show multicast rpf
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*prefix*>
<summary>

Syntax (EX Series Switch)

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.

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 summary of all multicast RPF information.

Required Privilege Level

view

List of Sample Output

show multicast rpf on page 170
show multicast rpf inet6 on page 171
show multicast rpf prefix on page 172
show multicast rpf summary on page 172

Output Fields Table 23 on page 170 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.
Neighbor	Upstream RPF neighbor.

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

Syntax

show multicast scope
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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 174
show multicast scope inet on page 174
show multicast scope inet6 on page 174

Output Fields

Table 24 on page 173 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.
Resolve Rejects	Number of kernel resolve rejects.

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

Syntax

show multicast sessions
<brief | detail | extensive>
<logical-system (all | *logical-system-name*)>
<*regular-expression*>

Syntax (EX Series Switch)

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.

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 176
show multicast sessions regular-expression detail on page 176

Output Fields

Table 25 on page 175 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.

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

Syntax

show multicast usage
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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 178
show multicast usage brief on page 178
show multicast usage instance on page 178
show multicast usage detail on page 178

Output Fields

Table 26 on page 177 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.)

Table 26: show multicast usage Output Fields *(continued)*

Field Name	Field Description
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.

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 178**.

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

Syntax

show pim bootstrap
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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 181
show pim bootstrap instance on page 181

Output Fields

Table 27 on page 180 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 to be elected to be the bootstrap router.
Local address	Local routing device's address.
Pri	Local routing device's address priority to be elected as the bootstrap router.
State	Local routing device's election state: **Candidate**, **Elected**, or **Ineligible**.
Timeout	How long until the local routing device declares the bootstrap router to be unreachable, in seconds.

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

Syntax
show pim interfaces
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
show pim interfaces
<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.

Description
Display information about the interfaces on which Protocol Independent Multicast (PIM) is configured.

Options
none—Display interface information for all family addresses for all routing instances.

inet | inet6—(Optional) Display interface information for IPv4 or IPv6 family addresses, respectively.

instance *instance-name*—(Optional) Display information about interfaces 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 interfaces on page 183
show pim interfaces inet on page 184
show pim interfaces inet6 on page 184

Output Fields
Table 28 on page 182 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: • **Sparse**—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). • **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.
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: • **DR**—Designated router. • **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.

show pim interfaces

```
user@host> show pim interfaces
Instance: PIM.master

Name               Stat Mode       IP V State NbrCnt JoinCnt(sg) JointCnt(*g) DR
 address
fe-0/0/0.0         Up   Sparse      4 2 DR         1           1            3
10.10.10.2
fe-0/0/3.0         Up   Sparse      4 2 DR         1           1            3
20.20.20.2
lo0.0              Up   Sparse      4 2 DR         0           0            0
10.255.72.54
pe-1/2/0.32769     Up   Sparse      4 2 P2P        0           0            0
t1-0/1/0.0         Up   Sparse      4 2 P2P        1           0            0
lo0.0              Up   Sparse      6 2 DR         0           0            0
fe80::2a0:a5ff:fe5e:209
```

show pim interfaces inet

```
user@host> show pim interfaces inet
Instance: PIM.master

Name               Stat Mode       IP V State NbrCnt JoinCnt(sg) JointCnt(*g) DR
 address
fe-0/0/0.0         Up   Sparse      4 2 DR         1           1            3
10.10.10.2
fe-0/0/3.0         Up   Sparse      4 2 DR         1           1            3
20.20.20.2
lo0.0              Up   Sparse      4 2 DR         0           0            0
10.255.72.54
pe-1/2/0.32769     Up   Sparse      4 2 P2P        0           0            0
t1-0/1/0.0         Up   Sparse      4 2 P2P        1           0            0
```

show pim interfaces inet6

```
user@host> show pim interfaces inet6
Instance: PIM.master

Name               Stat Mode       IP V State NbrCnt JoinCnt(sg) JointCnt(*g) DR
 address
lo0.0              Up   Sparse      6 2 DR         0           0            0
fe80::2a0:a5ff:fe5e:209
```

show pim join

Syntax

show pim join
<brief | detail | extensive | summary>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*range*>

Syntax (EX Series Switch)

show pim join
<brief | detail | extensive | summary>
<inet | inet6>
<instance *instance-name*>
<*range*>

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.

Description

Display information about Protocol Independent Multicast (PIM) groups.

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.

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***.

Required Privilege Level

view

Related Documentation

- **clear pim join on page 121**

List of Sample Output

Output Fields Table 29 on page 186 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
Source	Multicast source: • ***** (wildcard value) • ***ipv4-address*** • ***ipv6-address***	**brief detail extensive** none
RP	Rendezvous point for the PIM group.	**brief detail extensive** none
Flags	PIM flags: • **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)**.	**brief detail extensive** none
Upstream neighbor	Information about the upstream neighbor: **Direct**, **Local**, **Unknown**, or a specific IP address.	**extensive**

Table 29: show pim join Output Fields *(continued)*

Field Name	Field Description	Level of Output
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 joins nor prunes toward the RP, because this router is the rendezvous point. • **Local Source**—Sending neither joins nor prunes 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.	**extensive**
Downstream neighbors	Information about downstream interfaces: • **Interface**—Interface name for the downstream neighbor. NOTE: A pseudo PIM-SM interface appears for all IGMP-only interfaces. • **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**.	**extensive**
Assert Timeout	Length of time between assert cycles on downstream interface. Not displayed if assert timer is null.	**extensive**
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, **Timeout** is **Infinity**.	**extensive**

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

```
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 instance

```
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

```
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
    Downstream neighbors:
        Interface: so-1/0/0.0
            10.111.10.2 State: Join Flags: SRW Timeout: 174
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: SRW  Timeout: Infinity

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
    Downstream neighbors:
        Interface: so-1/0/0.0
            10.111.10.2 State: Join Flags: S Timeout: 174
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: S   Timeout: Infinity

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
    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
        Interface: mt-1/1/0.32768
            10.10.47.100 State: Join Flags: S   Timeout: Infinity

Instance: PIM.master Family: INET6
R = Rendezvous Point Tree, S = Sparse, W = Wildcard
```

show pim join instance 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
    Downstream neighbors:
        Interface: mt-1/1/0.32768
            10.10.47.101 State: Join Flags: SRW Timeout: 156

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

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
```

show pim neighbors

Syntax
show pim neighbors
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)
show pim neighbors
<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.

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 all routing instances.

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*—(Optional) Display information about neighbors for the specified 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 neighbors on page 193
show pim neighbors brief on page 193
show pim neighbors instance on page 193
show pim neighbors detail on page 193
show pim neighbors detail (with BFD) on page 193

Output Fields
Table 30 on page 191 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

Table 30: show pim neighbors Output Fields *(continued)*

Field Name	Field Description	Level of Output
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 router.	**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- or 10-digit number used to tag hello 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**
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**

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 193**.

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: fe-3/0/2.0
     Address: 192.168.195.37, IPv4, PIM v2, Mode: Sparse
 Hello Option Holdtime: 65535 seconds
 Hello Option DR Priority: 1
 Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
                               Join Suppression supported
 Rx Join: Group           Source          Timeout
          225.1.1.1       192.168.195.78        0
          225.1.1.1                             0
Interface: lo0.0
     Address: 10.255.245.91, IPv4, PIM v2, Mode: Sparse
 Hello Option Holdtime: 65535 seconds
 Hello Option DR Priority: 1
 Hello Option LAN Prune Delay: delay 500 ms override 2000 ms
                               Join Suppression supported
Interface: pd-6/0/0.32768
     Address: 0.0.0.0, IPv4, PIM v2, Mode: Sparse
 Hello Option Holdtime: 65535 seconds
 Hello Option DR Priority: 0
 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

Syntax

show pim rps
<brief | detail | extensive>
<*group-address*>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

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

List of Sample Output

show pim rps on page 197
show pim rps brief on page 197
show pim rps instance on page 197
show pim rps extensive on page 198
show pim rps extensive (PIM Anycast RP in Use) on page 198

Output Fields

Table 31 on page 196 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	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**
Time Active	How long the RP has been active, in the format ***hh:mm:ss***.	**detail extensive**
Device Index	Index value of the order in which the Junos OS finds and initializes the interface.	**detail extensive**
Subunit	Logical unit number of the interface.	**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.	**detail extensive**
Group Ranges	Addresses of groups that this RP spans.	**detail extensive**
Active groups using RP	Number of groups currently using this RP.	**detail extensive**
total	Total number of active groups for this RP.	**detail extensive**

Table 31: show pim rps Output Fields *(continued)*

Field Name	Field Description	Level of Output
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**
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**

show pim rps

```
user@host> show pim rps
Instance: PIM.master
Address family INET
RP address                Type        Holdtime Timeout Groups Group prefixes
10.255.14.144             static             0    None      1 224.0.0.0/4

Address family INET6
```

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 197**.

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

```
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 (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

Syntax

show pim source
<brief | detail>
<inet | inet6>
<instance *instance-name*>
<logical-system (all | *logical-system-name*)>
<*source-prefix*>

Syntax (EX Series Switch)

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.

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 201
show pim source brief on page 201
show pim source detail on page 201

Output Fields

Table 32 on page 200 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.

Table 32: show pim source Output Fields *(continued)*

Field Name	Field Description
RPF Address	Address of the source or reverse path.
Prefix/length	Prefix and prefix length for the route used to reach the RPF address.
Upstream interface	RPF interface toward the source address.
Neighbor address	Address of the RPF neighbor used to reach the source address.

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 201**.

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 statistics

Syntax

show pim statistics
<inet |inet6)>
<instance *instance-name*>
<interface *interface-name*>
<logical-system (all | *logical-system-name*)>

Syntax (EX Series Switch)

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.

Description

Display Protocol Independent Multicast (PIM) statistics.

Options

none—Display PIM statistics.

inet | inet6—(Optional) Display IPv4 or IPv6 PIM statistics.

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 123**

List of Sample Output

show pim statistics on page 208

Output Fields

Table 33 on page 202 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
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.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
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 acknowledgement packets.
V2 Candidate RP	PIM version 2 candidate RP packets.
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 acknowledgement 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.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
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.
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 router 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 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.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
RP Filtered Source	Number of PIM packets received when the router has a source address filter configured for the RP.
Rx Unknown Reg Stop	Number of register stop messages with an unknown type.
Rx Join/Prune no state	Number of join and prune messages received for which the router has no state.
Rx Join/Prune on upstream if	Number of join and prune messages received on the interface used to reach the upstream router, toward the RP.
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.
Rx Graft/Graft Ack no state	Number of graft and graft acknowledgement messages received for which the router has no state.
Rx Graft on upstream if	Number of graft messages received on the interface used to reach the upstream router, 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 does not support.
Rx data no state	Number of PIM control packets received for which the router has no state for the data type.
Rx RP no state	Number of PIM control packets received for which the router 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.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
No register encap if	Number of PIM register packets received when the first-hop router does not have an encapsulation interface.
No route upstream	Number of PIM control packets received when the router does not have a unicast route to the the interface used to reach the upstream router, 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 router has an RP mismatch.
RPF neighbor unknown	Number of PIM control packets received for which the router has an unknown RPF neighbor for the source.
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 configure 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 router: • 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.

Table 33: show pim statistics Output Fields *(continued)*

Field Name	Field Description
Rx Register msgs filtering drop	Number of 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.

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

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                        5
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 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
No RP                                   0
No register encap if                    0
No route upstream                       0
```

```
Nexthop Unusable                        0
RP mismatch                             0
RPF neighbor unknown                    0
Rx 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
```