

Chapter 14

IP Multicast Monitoring and Troubleshooting

Table 45 summarizes the command-line interface (CLI) commands you can use to monitor IP multicast. In the table, the commands are grouped by functionality. In the remainder of this chapter, they are explained alphabetically.

Table 45: Commands for Monitoring IP Multicast

Task Category	Task or Information to Monitor	Command
Generic IP Multicast Information	Entries in the multicast forwarding cache	show multicast route on page 460
	Entries in the multicast next-hop table.	show multicast nexthops on page 459
	Multicast reverse-path-forwarding calculations.	show multicast rpf on page 462
	Administratively scoped addresses.	show multicast scope on page 465
	Announced multicast sessions.	show multicast sessions on page 466
	Multicast statistics.	show multicast statistics on page 466
	Clear multicast statistics.	clear multicast statistics on page 446
	Most active multicast groups	show multicast usage on page 469
DVMRP	DVMRP and PIM tunnels.	show multicast tunnels on page 468
	DVMRP graft retransmission queue.	show dvmrp grafts on page 449
	DVMRP neighbors.	show dvmrp neighbors on page 451
	DVMRP prefixes.	show dvmrp prefix on page 452
	DVMRP prunes.	show dvmrp prunes on page 454
	Status of interfaces on which DVMRP is configured.	show dvmrp interfaces on page 450
	Most active DVMRP groups	show multicast usage on page 469
	MSDP	MSDP peers.
Clear MSDP source active cache.		clear msdp cache on page 446
MSDP statistics.		show msdp statistics on page 458
Clear MSDP statistics.		clear msdp statistics on page 446
Test MSDP peers.		test msdp on page 482

Task Category	Task or Information to Monitor	Command
PIM	Bootstrap routers.	show pim bootstrap on page 470
	PIM groups.	show pim join on page 472
	Clear the PIM join and prune states.	clear pim join on page 447
	Status of interfaces on which PIM is configured.	show pim interfaces on page 471
	PIM neighbors.	show pim neighbors on page 476
	Rendezvous points.	show pim rps on page 477
	PIM source RPF state.	show pim source on page 479
	PIM (*,*,RP) join and prune states.	show pim wildcard on page 481
	PIM statistics.	show pim statistics on page 479
	Clear PIM statistics.	clear pim statistics on page 448
	Most active PIM groups	show multicast usage on page 469
	IGMP	Members of IGMP groups.
Members of IGMP groups by interface.		show igmp interface on page 455
Clear IGMP group members.		clear igmp membership on page 443
IGMP statistics.		show igmp statistics on page 456
Clear IGMP statistics.		clear igmp statistics on page 445
SAP/SDP	Session announcement addresses.	show sap listen on page 481

clear igmp membership

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

Description Clear 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. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show igmp group on page 454, show igmp interface on page 455

Sample Output

```
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
```

After some time, the groups are relearned:

```
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

```

After some time, the groups are relearned:

```

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

```

```

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

```

```

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*>

Description Clear IGMP statistics.

Options none—Clear IGMP statistics on all interfaces.

interface *interface-name*—(Optional) Clear IGMP statistics on a specific interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show igmp statistics on page 456

Sample Output

```

user@host> show igmp statistics
IGMP statistics on all interfaces:
IGMP Message type      Received      Sent  Rx errors
Queries                 997          18296    0
Report V1               0             0        0
DVMRP                  19784        35476    0
PIM V1                 18310         0        0
Cisco Trace            0             0        0
Report V2               6             0        0
Leave                   0             0        0

Domain Wide Reports    0             0        0

IGMP statistics summary for all interfaces:
Unknown type           0
Bad Length             0
Bad Checksum           0
Bad Receive If        0
Rx non-local           0

user@host> clear igmp statistics

user@host> show igmp statistics
IGMP statistics on all interfaces:
IGMP Message type      Received      Sent  Rx errors
Queries                 0             2        0
Report V1               0             0        0
DVMRP                   2             3        0
PIM V1                  0             0        0
Cisco Trace            0             0        0
Report V2               0             0        0
Leave                   0             0        0
Domain Wide Reports    0             0        0

IGMP statistics summary for all interfaces:
Unknown type           0
Bad Length             0
Bad Checksum           0
Bad Receive If        0
Rx non-local           0

```

clear msdp cache

Syntax clear msdp cache <peer *peer address*>

Description Clear the entries in the MSDP source active cache.

Options none—Clear all entries in the MSDP source active cache.

peer peer address—(Optional) Clear the MSDP source active cache entries learned from a specific peer. You can include wildcard characters in the peer name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show msdp on page 457

clear msdp statistics

Syntax clear msdp statistics <peer *peer address*>

Description Clear MSDP statistics.

Options none—Clear all MSDP statistics.

peer peer address—(Optional) Clear the MSDP statistics learned from a specific peer. You can include wildcard characters in the peer name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show msdp statistics on page 458

clear multicast statistics

Syntax clear multicast statistics <interface *interface-name*>

Description Clear multicast statistics.

Options none—Clear multicast statistics on all interfaces.

interface interface-name—(Optional) Clear multicast statistics on a specific interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show multicast statistics on page 466

clear pim join

Syntax clear pim join <*group-address*>

Description Clear the PIM join and prune states.

Options none—Clear the PIM join and prune states for all groups.
group-address—(Optional) Clear a group address.

Required Privilege Level clear

See Also show pim join on page 472

clear pim statistics

Syntax clear pim statistics <interface *interface-name*>

Description Clear PIM statistics on the specified interface.

Options interface *interface-name*—Name of an interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level clear

See Also show pim statistics on page 479

Sample Output

```

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
Vl Query               1             0      0
Vl Register            0             0      0
...

```

show dvmrp grafts

Syntax show dvmrp grafts <brief | detail>

Description Display the entries in the DVMRP graft retransmission queue, which contains unacknowledged grafts. Normally, this queue is empty, so the output of the show dvmrp grafts command also is empty.

Options brief—(Optional) Display brief information about the entries in the graft retransmission queue.

detail—(Optional) Display detailed information about the entries in the graft retransmission queue.

Default: brief

Required Privilege Level view

Output Fields Group—Group address.

Source—Multicast source.

Expire—Time until the graft is retransmitted.

Neighbor—Upstream neighbor.

Sample Output

```

user@host> show dvmrp grafts
Group          Source          Expire Neighbor

```

show dvmrp interfaces

Syntax show dvmrp interfaces <brief | detail>

Description Display information about the interfaces on which DVMRP is enabled.

Options brief—(Optional) Display brief information about DVMRP interfaces.
 detail—(Optional) Display detailed information about DVMRP interfaces.

Default: brief

Required Privilege Level view

Output Fields Interface—Name of the interface.
 State—State of the interface. The state also is displayed in the show interfaces command.
 Leaf—Whether the interface is a leaf (that is, whether it has no neighbors) or whether it has neighbors.
 Metric—Interface metric. It can be a value from 1 through 31.
 Announce—Number of routes the interface is announcing.
 Peak—Maximum number of routes the interface has announced in the last minute.
 Interval (ms)—Interval between announcements, in milliseconds.

Sample Output

```

user@host> show dvmrp interfaces
Interface      State Leaf Metric Announce  Peak Interval (ms)
-----
ipip.0         Up   No    1      4      4 60000
    
```

show dvmrp neighbors

Syntax show dvmrp neighbors <brief | detail>

Description Display information about DVMRP neighbors.

Options brief—(Optional) Display brief information about DVMRP neighbors.
 detail—(Optional) Display detailed information about DVMRP neighbors.

Default: brief

Required Privilege Level view

Output Fields Neighbor—Address of the neighboring DVMRP router.
 Interface—Interface through which the neighbor is reachable.
 Version—Version of DVMRP that the neighbor is running, in the format *major.minor*.
 Flags—Information about the neighbor:

- 1—One way. The local router has seen the neighbor, but the neighbor has not seen the local router.
- G—Neighbor supports generation ID.
- L—Neighbor is a leaf router.
- N—Neighbor supports netmask in prunes and grafts.
- P—Neighbor supports pruning.
- S—Neighbor supports SNMP.

Routes—Number of routes learned from the neighbor.
 Timeout—Number of seconds until the neighbor information times out.
 Transitions—Number of generation ID changes that have occurred since the local router learned about the neighbor.

Sample Output

```
user@host> show dvmrp neighbors
Neighbor      Interface      Version  Flags  Routes  Timeout  Transitions
192.168.1.1   ipip.0         3.255   PGM    3       28       1
```

show dvmrp prefix

Syntax show dvmrp prefix <prefix> <brief | detail>

Description Display information about DVMRP prefixes.

Options brief—(Optional) Display brief information about DVMRP prefixes.
 detail—(Optional) Display detailed information about DVMRP prefixes.
 prefix—(Optional) Display information about specific prefixes.

Default: brief

Required Privilege Level view

Sample Output Sample Output: show dvmrp prefix brief on page 453
 Sample Output: show dvmrp prefix detail on page 453

Options at a Glance Table 46 summarizes which information is included in each of the show dvmrp prefix command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 46: Show DVMRP Prefix Output Field Summary

Options	Field Description
All	Age—Last time that the route was refreshed.
Detail	Cache lifetime—Lifetime of the group in the multicast cache, in seconds.
Detail	Grafts sent—Number of grafts sent to the multicast group.
Detail	group—Groups seen by the prefix.
All	Next hop—Next hop from which the route was learned.
All	Prefix—DVMRP route.
Detail	Prunes lifetime—Lifetime remaining and total lifetime of prunes, in seconds.
Detail	Prunes sent—Number of prunes sent to the multicast group.

Output Fields Prefix—DVMRP route.

Next hop—Next hop from which the route was learned.

Age—Last time that the route was refreshed.

group—(Detail output only) Groups seen by the prefix.

Prunes sent—(Detail output only) Number of prunes sent to the multicast group.

Grafts sent—(Detail output only) Number of grafts sent to the multicast group.

Cache lifetime—(Detail output only) Lifetime of the group in the multicast cache, in seconds.

Prunes lifetime—(Detail output only) Lifetime remaining and total lifetime of prunes, in seconds.

Sample Output: show dvmrp prefix brief

```
user@host> show dvmrp prefix brief
Prefix          Next hop      Age
0.0.0.0         /0 192.168.1.1 00:00:34
127.0.0.1       /32 127.0.0.1    16:26:50
128.109.46.0    /24 192.168.1.1  00:00:34
192.168.1.0     /24 192.168.1.1  00:00:34
204.70.248.160 /29 204.70.248.161 16:26:50
204.70.248.168 /29 204.70.248.162 16:26:49
204.70.248.176 /28 204.70.248.187 16:26:50
204.70.248.192 /26 204.70.248.224 16:26:50
```

Sample Output: show dvmrp prefix detail

```
user@host> show dvmrp prefix detail
Prefix          Next hop      Age
0.0.0.0         /0 192.168.1.1  00:00:03
  224.2.127.254:
    Prunes sent Grafts sent Cache lifetime Prune lifetime
          0         0         0         0/ 0
  224.2.127.254:
    Prunes sent Grafts sent Cache lifetime Prune lifetime
          0         0         0         0/ 0
  224.2.139.68:
    Prunes sent Grafts sent Cache lifetime Prune lifetime
          2         2         0         0/ 7200
  224.2.245.3:
    Prunes sent Grafts sent Cache lifetime Prune lifetime
          2         2         0         0/ 7200
  ...
```

show dvmrp prunes

Syntax show dvmrp prunes <all> <rx> <tx> <brief | detail>

Description Display information about active DVMRP prunes.

Options all—(Optional) Display information about all received and transmitted prunes.

brief—(Optional) Display brief information about DVMRP pruning.

detail—(Optional) Display detailed information about DVMRP pruning.

rx—(Optional) Display information about received prunes.

tx—(Optional) Display information about transmitted prunes.

Default: brief

Required Privilege Level view

Output Fields Group—Group address.

Source prefix—Prefix that the prune is for.

Timeout—Lifetime of the prune, in seconds.

Neighbor—Neighbor to whom the prune was sent or from whom the prune was received.

Sample Output

```
user@host> show dvmrp prunes
Group           Source prefix      Timeout Neighbor
224.0.1.1       128.112.0.0       /12    7077 192.168.1.1
224.0.1.32      160.0.0.0         /3     7087 192.168.1.1
224.2.123.4     136.0.0.0         /5     6955 192.168.1.1
224.2.127.1     129.0.0.0         /8     7046 192.168.1.1
224.2.135.86    128.102.128.0     /17    7071 192.168.1.1
224.2.135.86    129.0.0.0         /8     7074 192.168.1.1
224.2.135.86    130.0.0.0         /7     7071 192.168.1.1
...
```

show igmp group

Syntax show igmp group <group-name> <brief | detail>

Description Display information about IGMP group membership.

Options brief—(Optional) Display brief information about IGMP group members.

detail—(Optional) Display detailed information about IGMP group members.

group-name—(Optional) IP address of an IGMP group.

Default: brief

Required Privilege Level view

See Also clear igmp membership on page 443

- Output Fields** Interface—Name of the interface. A name of “local” means that the local router joined the group itself.
- Group—Group address.
- Last reported—Address of the host that joined the group.
- Timeout—When the group membership expires.

Sample Output

```

user@host> show igmp group
Interface      Group          Last Reported  Timeout
ge-4/1/0.0    224.1.1.1     10.6.0.7      239
ge-4/1/0.0    224.1.1.2     10.6.0.7      252
ge-4/1/0.0    224.1.1.3     10.6.0.7      257
ge-5/3/0.0    224.3.3.1     10.9.0.5      138
ge-5/3/0.0    224.3.3.2     10.9.0.5      227
local         224.0.0.2     (null)         0
local         224.0.0.13    (null)         0
local         224.0.1.39    (null)         0
local         224.0.1.40    (null)         0

```

show igmp interface

Syntax show igmp interface <interface-name> <brief | detail>

Description Display information about the interfaces on which IGMP is configured.

Options brief—(Optional) Display brief information about IGMP interfaces.

detail—(Optional) Display detailed information about IGMP interfaces.

interface-name—(Optional) Display information about the specified interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Default: brief

Required Privilege Level view

See Also clear igmp membership on page 443

- Output Fields** Interface—Name of the interface.
- State—State of the interface. It can be Up or Down.
- Querier—Address of the neighbor that has been elected to send membership queries.
- Timeout—Time until the querier is declared to be inactive, in seconds.
- Version—IGMP version being used on the interface.
- Groups—Number of groups on the interface.

```

Sample Output user@host> show igmp interface
Interface      State Querier      Timeout Version Groups
ge-2/0/0.0    Down
ge-4/0/0.0    Up    10.3.0.9         199      2      0
ge-4/1/0.0    Up    10.6.0.1         None     2      3
ge-3/0/0.0    Down
ge-5/3/0.0    Up    10.9.0.1         None     2      2

```

show igmp statistics

Syntax show igmp statistics <interface *interface-name*>

Description Display IGMP statistics.

Options interface *interface-name*—(Optional) Display statistics about the specified interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.

Required Privilege Level view

See Also clear igmp statistics on page 445

Output Fields IGMP statistics on all interfaces or IGMP statistics for interfaces *interface-name*—Name of the interface for which the statistics are being reported.

Received—Number of received statistics.

Transmitted—Number of transmitted statistics.

Rx errors—Number of received packets that contained errors.

IGMP statistics summary for all interfaces—Summary of IGMP statistics for all interfaces.

```

Sample Output user@host> show igmp statistics
IGMP statistics on all interfaces:
IGMP message type      Received Transmitted  Rx errors
Queries                986      18131      0
Report V1              0         0         0
DVMRP                 19603    35171     0
PIM V1                18137     0         0
Cisco Trace            0         0         0
Report V2              6         0         0
Leave                  0         0         0
Domain Wide Reports    0         0         0

IGMP statistics summary for all interfaces:
Unknown type          0
Bad Length            0
Bad Checksum          0
Bad Receive If        0
Rx non-local          0

```

show msdp

Syntax	show msdp <peer <i>peer address</i> > <source-active <i>group</i> <i>originator</i> <i>source</i> > <brief detail>
Description	Display information about MSDP.
Options	<p>brief—Display brief information about MSDP.</p> <p>detail—Display detailed information about MSDP.</p> <p>peer <i>peer address</i>—(Optional) Display information about a particular MSDP peer.</p> <p>source-active <i>group</i>—(Optional) Display source active cache information for a particular group.</p> <p>source-active <i>originator</i>—(Optional) Display information about the MSDP peer that originated the source active cache entries.</p> <p>source-active <i>source</i>—(Optional) Display source active cache for a particular source.</p>
Required Privilege Level	view
Output Fields	<p>Peer—Address of peer.</p> <p>Local address—Local address of peer.</p> <p>State—Status of the MSDP connection. It can be Listen, Established, or Inactive.</p> <p>Last up/down—Time of most recent peer-state change.</p> <p>Peer Connect Retries—Number of peer connect retries.</p> <p>State timer expires—Number of seconds before state timer expires.</p> <p>Peer Times out—Number of peer timeouts.</p>
Sample output	<pre> user@host> show msdp Peer address Local address State Last up/down Peer-Group 10.255.245.34 10.255.245.39 Listen 00:05:07 user@host> show msdp detail Peer: 10.255.245.34 Local address: 10.255.245.39 State: Listen Peer Connect Retries: 0 State timer expires: 0 Peer: 10.255.245.43 Local address: 10.255.245.39 State: Established Peer Connect Retries: 0 State timer expires: 53 Peer Times out: 2 </pre>

show msdp statistics

Syntax show msdp statistics <peer *peer address*>

Description Display statistics about MSDP peers.

Output Fields Peer—Address of peer.

Last state change—How long ago the peer state changed.

Last message received from peer—How long ago the last message was received from peer.

RPF failures—Number of RPF failures.

Remote closes—Number of times the remote peer closed.

Peer timeouts—Number of peer timeouts.

SA messages sent—Number of source active messages sent.

SA messages received—Number of source active messages received.

SA request messages sent—Number of source active request messages sent.

SA request messages received—Number of source active request messages received.

SA response messages sent—Number of source active response messages sent.

SA response messages received—Number of source active response messages received.

Keepalive messages sent—Number of keepalive messages sent.

Keepalive messages received—Number of keepalive messages received.

Unknown messages received—Number of unknown messages received.

Error messages received—Number of unknown messages received.

Sample Output

```
user@host> show msdp statistics
Peer: 10.255.245.39
Last State Change: 11:54:49 (00:24:59)
Last message received from peer: 11:53:32 (00:26:16)
RPF Failures: 0
Remote Closes: 0
Peer Timeouts: 0
SA messages sent: 376
SA messages received: 459
SA request messages sent: 0
SA request messages received: 0
SA response messages sent: 0
SA response messages received: 0
Keepalive messages sent: 17
Keepalive messages received: 19
Unknown messages received: 0
Error messages received: 0
```

show multicast nexthops

Syntax show multicast nexthops <identifier *identifier-number*> <brief | detail>

Description Display the entries in the multicast next-hop table.

Options brief—(Optional) Display brief information about the entries.

detail—(Optional) Display detailed information about the entries.

identifier *identifier-number*—(Optional) Show particular next-hop by ID number. It can be a number between 1 and 65535.

Default: brief

Required Privilege Level view

Output Fields ID—Next-hop identifier of the prefix. The identifier is returned by the router's Packet Forwarding Engine.

Refcnt—Number of cache entries that are using this next hop.

KRefCount—The kernel's reference count for the nexthop.

Downstream interface index list—Index or indexes of the interfaces used to reach the next hop.

Sample Output

```
user@host> show multicast nexthops brief
ID      Refcount  KRefCount  Downstream interface
11      2          1         local
          so-1/1/0.0

33      4          2         so-0/0/0.0
          so-3/1/0.0
          t3-4/2/0.0
          ge-6/3/0.0

39      8          4         so-0/0/0.0
          at-2/1/0.0
          at-2/1/0.1
          so-3/1/0.0
          t3-4/2/0.0
          ge-6/3/0.0

62      6          3         so-0/0/0.0
          at-2/1/0.0
          at-2/1/0.1
          so-3/1/0.0
          ge-6/3/0.0

79      78         39         so-0/0/0.0
          at-2/1/0.0
          so-3/1/0.0
          ge-6/3/0.0
          ge-7/2/0.0
          ge-7/3/0.0
```

show multicast route

Syntax show multicast route *<regular-expression>* *<all>* *<active>* *<inactive>* *<group group>*
<source-prefix prefix> *<brief | detail>*

Description Display the entries in the multicast forwarding table. You can display similar information with the show route table inet.1 command.

Options active—(Optional) Display all active entries in the multicast forwarding table.

all—(Optional) Display all entries in the multicast forwarding table.

brief—(Optional) Display brief information about the multicast forwarding table entries.

detail—(Optional) Display detailed information about the multicast forwarding table entries.

group *group*—(Optional) Display the cache entries for a particular group.

inactive—(Optional) Display all inactive entries in the multicast forwarding table.

regular-expression—(Optional) Display information about the multicast forwarding table entries that match a UNIX-style regular expression.

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

Default: brief

Required Privilege Level view

Sample Output Sample Output: show multicast route brief on page 462
 Sample Output: show multicast route detail on page 462

Options at a Glance Table 47 summarizes which information is included in the output of each of the show multicast route commands. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 47: Show Multicast Route Output Field Summary

Options	Field Description
All	Act—Whether the group is active (A) or inactive (I).
Detail	AgeOut—Time until the prefix is removed from the multicast forwarding table.
Detail	Cloned from—Actual prefix on which the multicast forwarding table entry is based.
All	Group—Group address.
All	InIf—Index of the incoming interface.
All	NHid—Next-hop identifier of the prefix.
Detail	Packets—Number of packets that have been forwarded to this prefix.
All	Pru—Whether the prefix is pruned (P) or forwarding (F).
Detail	Session—Name of the multicast session.
Brief	Session name—Name of the multicast session.
Detail	Source—Source address of the host that triggered creation of the multicast forwarding table entry.
All	Source prefix—Prefix and length of the source as it is in the multicast forwarding table.

Output Fields Group—Group address.

Source prefix—Prefix and length of the source as it is in the multicast forwarding table.

Act—Whether the group is active (A) or inactive (I).

Pru—Whether the prefix is pruned (P) or forwarding (F).

InIf—Index of the incoming interface. The index also is listed in the output of the show interfaces command.

NHid—Next-hop identifier of the prefix. The identifier is returned by the router's Packet Forwarding Engine and is also displayed in the output of the show multicast nexthops command.

AgeOut—(Detail output only) Time until the prefix is removed from the multicast forwarding table.

Packets—(Detail output only) Number of packets that have been forwarded to this prefix.

Session—(Detail output only) Name of the multicast session.

Cloned from—(Detail output only) Actual prefix on which the multicast forwarding table entry is based.

Source—(Detail output only) Source address of the host that triggered creation of the multicast forwarding table entry.

Session name—(Brief only) Name of the multicast session.

```

Sample Output: show multicast route brief
user@host> show multicast route brief
Group          Source prefix  Act Pru InIf  NHid  Session name
224.0.1.1      128.112.0.0   /12 I  P  4    0    Network Time Protocol
224.0.1.32     160.0.0.0     /3  I  P  4    0
224.2.123.4    136.0.0.0     /5  I  P  4    0    Multimedia Conference Ca
224.2.127.1    129.0.0.0     /8  I  P  4    0    Multimedia Conference Ca
224.2.127.254  128.0.0.0     /11 A  F  4    42   SAPv1 Announcements
224.2.127.254  128.32.0.0    /11 A  F  4    42   SAPv1 Announcements
224.2.127.254  128.102.64.0  /18 A  F  4    42   SAPv1 Announcements
224.2.127.254  130.0.0.0     /7  A  F  4    42   SAPv1 Announcements
224.2.127.254  136.0.0.0     /5  A  F  4    42   SAPv1 Announcements
224.2.127.254  192.128.0.0   /9  A  F  4    42   SAPv1 Announcements
224.2.127.254  196.0.0.0     /6  A  F  4    42   SAPv1 Announcements
...

```

```

Sample Output: show multicast route detail
user@host> show multicast route detail
Group          Source prefix  Act Pru InIf  NHid  AgeOut  Packets Session
224.0.1.1      128.112.0.0   /12 I  P  4    0        0    0 Network
  Cloned from:  0.0.0.0       /0
  Source:       128.112.136.5
224.0.1.32     160.0.0.0     /3  I  P  4    0        0    0
  Cloned from:  0.0.0.0       /0
  Source:       171.68.27.126
224.2.123.4    136.0.0.0     /5  I  P  4    0        0    0 Multimed
  Cloned from:  0.0.0.0       /0
  Source:       137.132.50.14
224.2.127.1    129.0.0.0     /8  I  P  4    0        0    0 Multimed
  Cloned from:  0.0.0.0       /0
  Source:       129.79.17.70
224.2.127.254  128.0.0.0     /11 A  F  4    42       122    6 SAPv1 An
  Cloned from:  0.0.0.0       /0
  Source:       128.9.160.109
224.2.127.254  128.32.0.0    /11 A  F  4    42       428    2 SAPv1 An
  Cloned from:  0.0.0.0       /0
  Source:       128.32.131.169
...

```

show multicast rpf

Syntax show multicast rpf <prefix> <brief | detail>

Description Display information about multicast reverse-path-forwarding calculations.

Options brief—(Optional) Display brief information about the RPF calculations.

detail—(Optional) Display detailed information about the RPF calculations.

prefix—(Optional) Display the RPF calculation information for the specified prefix.

Required Privilege Level view

Sample Output Sample Output: show multicast rpf brief on page 464
Sample Output: show multicast rpf detail on page 464

Options at a Glance Table 48 summarizes which information is included in each of the show multicast rpf command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 48: Show Multicast RPF Output Field Summary

Options	Field Description
Detail	Cloned from—Actual prefix on which the multicast forwarding table entry is based.
All	Protocol—How the route was learned.
All	RPF interface—Upstream interface.
All	RPF neighbor—Upstream neighbor.
All	Source prefix—Prefix and length of the source as it is in the multicast forwarding table.

Output Fields Source prefix—Source route.

Protocol—How the route was learned.

RPF interface—Upstream interface.

RPF neighbor—Upstream neighbor.

Cloned from—(Detail output only) Actual prefix on which the cache entry is based.

**Sample Output: show
multicast rpf brief**

```

user@host> show multicast rpf brief
Source prefix      Protocol  RPF interface  RPF neighbor
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1
0.0.0.0            /2  Cloned        ipip.0         192.168.1.1
0.0.0.0            /3  Cloned        ipip.0         192.168.1.1
127.0.0.1          /32  Direct        lo0.0
128.0.0.0          /10  Cloned        ipip.0         192.168.1.1
128.0.0.0          /11  Cloned        ipip.0         192.168.1.1
128.32.0.0         /11  Cloned        ipip.0         192.168.1.1
128.64.0.0         /11  Cloned        ipip.0         192.168.1.1
128.80.0.0         /12  Cloned        ipip.0         192.168.1.1
128.102.32.0       /19  Cloned        ipip.0         192.168.1.1
128.102.32.0       /20  Cloned        ipip.0         192.168.1.1
128.102.64.0       /18  Cloned        ipip.0         192.168.1.1
128.102.128.0      /17  Cloned        ipip.0         192.168.1.1
128.109.46.0       /24  DVMRP         ipip.0         192.168.1.1
128.112.0.0        /12  Cloned        ipip.0         192.168.1.1
...

```

**Sample Output: show
multicast rpf detail**

```

user@host> show multicast rpf detail
Source prefix      Protocol  RPF interface  RPF neighbor
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1
0.0.0.0            /2  Cloned        ipip.0         192.168.1.1
Cloned from:
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1

0.0.0.0            /3  Cloned        ipip.0         192.168.1.1
Cloned from:
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1

127.0.0.1          /32  Direct        lo0.0
128.0.0.0          /10  Cloned        ipip.0         192.168.1.1
Cloned from:
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1

128.0.0.0          /11  Cloned        ipip.0         192.168.1.1
Cloned from:
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1

128.32.0.0         /11  Cloned        ipip.0         192.168.1.1
Cloned from:
0.0.0.0            /0  DVMRP         ipip.0         192.168.1.1
...

```

show multicast scope

Syntax show multicast scope <brief | detail>

Description Display administratively scoped multicast information.

Options brief—(Optional) Display brief information.

detail—(Optional) Display detailed information.

Default: brief

Required Privilege Level view

Output Fields Scope name—Name of the multicast scope.

Group prefix—Prefix of the multicast scope group.

Interface—Interface that is the boundary or edge of the administrative scope.

Rejects—Number of packets rejected at the edge of the scope.

Sample Output

```
user@host> show multicast scope
Scope name      Group prefix      Interface      Rejects
"local"         239.255.0.0      /16 ipip.0     0
```

show multicast sessions

Syntax show multicast sessions <regular-expression> <brief | detail | extensive>

Description Display information about announced multicast sessions.

Options brief—(Optional) List the sessions.

detail—(Optional) Format the list of sessions.

extensive—(Optional) Display the list of sessions in a raw format.

regular-expression—(Optional) Display information about announced sessions that match a UNIX-style regular expression.

Default: brief

Required Privilege Level view

Output Fields session-names—Name of the known announced multicast sessions.

Sample Output

```
user@host> show multicast sessions
Bird test
Colorado/UCSD Networks Class
Colorado/UCSD wb
LBL - Deb test
LabWeb - The Spectro-Microscopy Collaboratory
NASA - Shuttle Mission STS-95
NASA TV - Broadcast from NASA HQ
NLANR Techs Conf. MPEG1 (IP/TV)
SPT Meeting(private)
Titanic Traylor
UC Berkeley MIG seminar
UW CS&E Colloquium
test1@fsu-acns
```

show multicast statistics

Syntax show multicast statistics

Description Display multicast statistics.

Required Privilege Level view

See Also clear multicast statistics on page 446

- Output Fields**
- Interface—Name of the interface for which statistics are being reported.
 - Protocol—Primary multicast protocol on the interface.
 - Resolve primary—Number of resolve requests processed by the primary multicast protocol on the interface.
 - Resolve secondary—Number of resolve requests processed on the interface by the other protocols configured on the router.
 - Resolve no route—Number of resolve requests that were ignored because there was no route to the source.
 - Resolve errors—Number of resolve requests that were ignored because of internal errors.
 - Interface mismatches—Number of multicast packets that arrived on a downstream interface.
 - IfMismatch no route—Number of mismatches that were ignored because there was no route to the source.
 - IfMismatch errors—Number of mismatches that were ignored because of internal errors.

Sample Output

```

user@host> show multicast statistics
Interface          Protocol          Resolve          Resolve          Resolve          Resolve
                  primary          secondary        no route          errors
local              0                0                0                0
fxp0.0             PIM-dense        100              100              0                0
fxp1.0             PIM-dense        62               62               0                0
iPIP.0             DVMRP            6309             6309             3                0

Interface          Protocol          Interface          IfMismatch          IfMismatch
                  mismatches        no route          errors
local              0                0                0
fxp0.0             PIM-dense        0                0                0
fxp1.0             PIM-dense        0                0                0
iPIP.0             DVMRP            0                0                0

Resolve requests on interfaces not enabled for multicast 0
Interface Mismatches on interfaces not enabled for multicast 0

```

• show multicast tunnels

• **Syntax** show multicast tunnels

• **Description** Display information about DVMRP or PIM tunnels.

• **Required Privilege Level** view

• **Output Fields** Interface—Name of the interface.

• Local address—Address of the local side of the tunnel.

• Remote address—Address of the remote side of the tunnel.

• TTL—Tunnel's time-to-live value. It can be a value from 1 through 255.

• **Sample Output** user@host> **show multicast tunnels**

Interface	Local address	Remote address	TTL
ipip.0	204.69.248.187	192.168.1.1	64

show multicast usage

Syntax	show multicast usage <brief detail>
Description	Display usage information about the ten most active DVMRP or PIM groups.
Required Privilege Level	view
Output Fields	Group—Group address. Sources—Number of sources. Packets—Number of packets. Bytes—Amount of memory used.
Sample Output	<pre> user@host> show multicast usage Group Sources Packets Bytes 224.225.1.1 1 1 0 224.225.1.2 1 1 0 224.225.1.3 1 1 0 224.225.1.4 1 1 0 224.225.1.5 1 1 0 Prefix /len Groups Packets Bytes 10.6.0.1 /32 489 489 0 10.255.245.35 /32 2 0 0 user@host> show multicast usage detail Group Sources Packets Bytes 224.225.1.1 1 1 0 Source: 10.6.0.1 /32 Packets: 1 Bytes: 0 224.225.1.2 1 1 0 Source: 10.6.0.1 /32 Packets: 1 Bytes: 0 224.225.1.3 1 1 0 Source: 10.6.0.1 /32 Packets: 1 Bytes: 0 224.225.1.4 1 1 0 Source: 10.6.0.1 /32 Packets: 1 Bytes: 0 224.225.1.5 1 1 0 Source: 10.6.0.1 /32 Packets: 1 Bytes: 0 </pre>

• show pim bootstrap

• **Syntax** show pim bootstrap

• **Description** For PIM sparse mode only, display information about PIM bootstrap routers.

• **Required Privilege Level** view

• **Output Fields** Bootstrap Rtr—Bootstrap router.

• Pri—Priority of the router to be elected to be the bootstrap router.

• Local address—The local router's address.

• Pri—The local router's address priority to be elected as the bootstrap router.

• State—The local router's election state. It can be Candidate, Elected, or Ineligible.

• Timeout—How long until the local router declares the bootstrap router to be unreachable, in seconds.

• **Sample Output**

```
user@host> show pim bootstrap
BSR          Pri Local address  Pri State      Timeout
10.10.20.103  3 10.10.20.101     0 InEligible   119
```

show pim interfaces

Syntax show pim interfaces

Description Display information about the interfaces on which PIM is configured.

Required Privilege Level view

Output Fields Interface—Interface name.

Stat—State of the interface. The state also is displayed in the show interfaces command.

Mode—PIM mode running on the interface. It can be Dense, Sparse, or SparseDense.

V—PIM version running on the interface. It can be either 1 or 2.

State—State of PIM on the interface. It can be one of the following:

DR—Designated router.

NotDR—Not the designated router.

P2P—Point to point.

Priority—Interface's priority to become the designated router.

DR address—Address of the designated router.

Neighbors—Number of neighbors that have been seen on the interface.

Sample Output

```

user@host> show pim interfaces
Name           Stat Mode           V State  Priority DR address  Neighbors
lo0.0          Up   SparseDense 2 DR      1 10.10.20.101 0
at-1/0/0.0     Up   SparseDense 1 P2P      1
so-1/1/0.0     Up   SparseDense 1 P2P      1
ge-2/0/0.0     Up   SparseDense 2 DR      3 10.10.20.1   3
ge-3/0/0.0     Up   SparseDense 2 NotDR   1 10.10.30.11  2
so-5/0/0.0     Down SparseDense 1 P2P      0
so-5/0/1.0     Up   SparseDense 1 P2P      1
so-5/0/2.0     Down SparseDense 1 P2P      0
pe-6/3/0.32769 Up   Sparse       2 P2P      0

```

show pim join

Syntax show pim join <range> <brief | detail | extensive>

Description Display information about PIM groups.

Options brief—(Optional) Display brief information.

detail—(Optional) Display detailed information.

extensive—(Optional) Display very detailed information.

range—(Optional) Address range of the group, specified as *prefix/prefix-length*.

Default: brief

Required Privilege Level view

See Also clear pim join on page 447

Sample Output Sample Output: show pim join brief on page 474
 Sample Output: show pim join detail on page 474
 Sample Output: show pim join extensive on page 475

Options at a Glance Table 49 summarizes which information is included in each of the show pim join command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 49: Show PIM Join Output Field Summary

Options	Field Description
Detail Extensive	Downstream interfaces—Address of interfaces from which join or prune messages have been received or created.
Extensive	Downstream neighbors—Detailed information about downstream interfaces, including interface name, state, flags, and timeout.
All	Flags—PIM flags.
All	Group—Group address.
All	RP—Rendezvous point for the PIM group.
All	Source—Multicast source.
All	Upstream interface—Address of interface used to reach the upstream router, toward the RP.
Extensive	Upstream state—Information about upstream interface.

Output Fields Group—Group address.

Source—Multicast source.

RP—Rendezvous point for the PIM group.

Flags—PIM flags. It can be one or more of the following:

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.

spt-pending—The software has initiated the switch to the shortest-path tree for this source.

wildcard—Indicates that this entry is on the shared tree.

Upstream interface—Address of interface used to reach the upstream router, toward the rendezvous point.

Upstream state—(Extensive output only) Information about the upstream interface. It can be zero or more of the following:

Join to RP—Sending a join to the Rendezvous Point.

Join to Source—Sending a join to the Source.

Local RP—This router is the RP and hence is sending neither joins nor prunes toward the RP.

Local Source—Source is locally attached to this router and hence is sending neither joins nor prunes toward the source.

Prune to RP—Sending a prune to the Rendezvous Point.

Prune to Source—Sending a prune to the source.

Downstream interfaces—(Detail and Extensive output only) Address of interface to reach the downstream router.

Downstream neighbors—(Extensive output only) Detailed information about the downstream interfaces:

Interface address—Address of downstream neighbor.

State—Information about the downstream neighbor. Can be join or prune.

Flags—PIM join flags. It can be zero or more of the following: S (Sparse), R (RPtree), and W (Wildcard).

Timeout—(Extensive output only) Time remaining until the neighbor is declared to be inactive, in seconds.

• **Sample Output: show pim join brief**

```

user@host> show pim join brief
Group          Source          RP          Flags
224.0.1.39     10.10.20.103   RP          dense
  Upstream interface: so-2/0/0.0
224.0.1.40     10.10.20.103   RP          dense
  Upstream interface: so-2/0/0.0
224.1.1.1      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
224.1.1.1      10.10.20.17   RP          sparse
  Upstream interface: so-2/0/0.0
224.1.1.1      10.30.1.1     RP          sparse
  Upstream interface: so-1/0/0.0
224.1.1.2      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
224.1.1.2      10.10.20.17   RP          sparse
  Upstream interface: so-2/0/0.0
224.1.1.2      10.30.1.1     RP          sparse
  Upstream interface: o-1/0/0.0
...

```

• **Sample Output: show pim join detail**

```

user@host> show pim join detail
Group          Source          RP          Flags
224.0.1.39     10.10.20.103   RP          dense
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    local
224.0.1.40     10.10.20.103   RP          dense
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    local
224.1.1.1      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    so-1/0/0.0
224.1.1.1      10.10.20.17   RP          sparse
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    so-1/0/0.0
224.1.1.1      10.30.1.1     RP          sparse
  Upstream interface: so-1/0/0.0
  Downstream interfaces:
    so-2/0/0.0
    pime.32769
224.1.1.2      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    so-1/0/0.0
224.1.1.2      10.10.20.17   RP          sparse
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    so-1/0/0.0
224.1.1.2      10.30.1.1     RP          sparse
  Upstream interface: so-1/0/0.0
  Downstream interfaces:
    so-2/0/0.0
    pime.32769
...

```

Sample Output: show pim
join extensive

```

user@host> show pim join extensive
Group          Source          RP          Flags
224.0.1.39     10.10.20.103   10.10.20.103  dense
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    local
    so-1/0/0.0(Assert Lost)

224.0.1.40     10.10.20.103   10.10.20.103  dense
  Upstream interface: so-2/0/0.0
  Downstream interfaces:
    local
    so-1/0/0.0(Assert Lost)

224.1.1.1      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
  Upstream State: Join to RP
  Downstream Neighbors:
  Interface: so-1/0/0.0
    10.10.20.1      State: Join   Flags: SRW   Timeout: 135

224.1.1.1      10.10.20.17    10.10.20.17   sparse
  Upstream interface: so-2/0/0.0
  Upstream State: Join to Source
  Downstream Neighbors:
  Interface: so-1/0/0.0
    10.10.20.1      State: Join   Flags: S     Timeout: 159

224.1.1.1      10.30.1.1      10.30.1.1     sparse
  Upstream interface: so-1/0/0.0
  Upstream State: Local Source, Prune to RP
  Downstream Neighbors:
  Interface: so-2/0/0.0
    10.10.20.10     State: Join   Flags: S     Timeout: 195
  Interface: register to RP 10.10.20.103 on pime.32769

224.1.1.2      0.0.0.0        10.10.20.103  sparse,rptree,wildcard
  Upstream interface: so-2/0/0.0
  Upstream State: Join to RP
  Downstream Neighbors:
  Interface: so-1/0/0.0
    10.10.20.1      State: Join   Flags: SRW   Timeout: 141

224.1.1.2      10.10.20.17    10.10.20.17   sparse
  Upstream interface: so-2/0/0.0
  Upstream State: Join to Source
  Downstream Neighbors:
  Interface: so-1/0/0.0
    10.10.20.1      State: Join   Flags: S     Timeout: 164

224.1.1.2      10.30.1.1      10.30.1.1     sparse
  Upstream interface: so-1/0/0.0
  Upstream State: Local Source, Prune to RP
  Downstream Neighbors:
  Interface: so-2/0/0.0
    10.10.20.10     State: Join   Flags: S     Timeout: 195
  Interface: register to RP 10.10.20.103 on pime.32769
...

```

show pim neighbors

Syntax show pim neighbors <brief | detail>

Description Display information about PIM neighbors.

Options brief—(Optional) Display brief information.

detail—(Optional) Display detailed information.

Default: brief

Required Privilege Level view

Output Fields Interface—Interface name.

DR priority—For PIM Version 2 only, the interface's priority to become the designated router.

Neighbor addr—Address of the neighbor.

V—PIM version running on the neighbor.

Mode—Mode. It can be Sparse, Dense, SparseDense, or Unknown. When the neighbor is running PIM Version 2, this mode is always Unknown.

Holdtime—Lifetime of the neighbor, in seconds.

Timeout—Time until the neighbor is declared to be inactive, in seconds.

Sample Output

```

user@host> show pim neighbors
Interface          DR priority Neighbor addr  V Mode          Holdtime Timeout
at-1/0/0.0         none 10.10.30.3     1 SparseDense   105      99
so-1/1/0.0         none 10.10.40.7     1 SparseDense   105      82
ge-2/0/0.0         1 10.10.20.3    2 Unknown       105      93
ge-2/0/0.0         1 10.10.20.4    2 Unknown       105     101
ge-2/0/0.0         1 10.10.20.5    2 Unknown       105      88
ge-3/0/0.0         1 10.10.20.10   2 Unknown       105      78
ge-3/0/0.0         1 10.10.20.11   2 Unknown       105     100
so-5/1/0.0         none 10.10.50.6     1 SparseDense   105      79

```

show pim rps

Syntax	show pim rps <group-address> <brief detail extensive>
Description	Display information about PIM rendezvous points (RPs).
Options	<p>brief—(Optional) Display brief information.</p> <p>detail—(Optional) Display detailed information, including RP calculations.</p> <p>extensive—(Optional) Display very detailed information.</p> <p>group-address—(Optional) Display the RPs for a particular group. If you specify a group address, the output lists which router should be the RP for that group.</p> <p>Default: brief</p>
Required Privilege Level	view
Sample Output	<p>Sample Output: show pim rps brief on page 478</p> <p>Sample Output: show pim rps detail on page 478</p>
Options at a Glance	Table 50 summarizes which information is included in each of the show pim rps command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the output fields are listed in the order in which they are displayed.

Table 50: Show PIM RPS Output Fields Summary

Options	Field Description
All	Active groups—Number of groups currently using this RP.
Brief	Group prefixes—Addresses of groups that this RP can span.
Detail	Group Ranges—Addresses of groups that this RP spans.
All	Holdtime—How long to keep the RP active, in seconds.
Detail	Learned—Address and method by which the RP was learned.
All	RP address—Address of the RP.
Detail	Time Active—How long the RP has been active.
Brief	Timeout—Lifetime of the RP, in seconds.
Detail	Total—Total number of active groups.
Brief	Type—Type of RP.

- **Output Fields** RP address—Address of the RP.
-
- Learned—(Detail output only) Address and method by which the RP was learned.
-
- Time active—(Detail output only) How long the RP has been active.
-
- Type—(Brief output only) Type of RP. It can be auto-rp, bootstrap, or static.
-
- Holdtime—How long to keep the RP active, in seconds.
-
- Group ranges—(Detail output only) Addresses of groups that this RP spans.
-
- Timeout—(Brief output only) Lifetime of the RP, in seconds.
-
- Active groups—Number of groups currently using this RP.
-
- Group prefixes—(Brief output only) Addresses of groups that this RP can span.
-
- Total—(Detail output only) Total number of active groups.

Sample Output: show pim rps brief

```
user@host> show pim rps brief
RP address      Type      Holdtime Timeout Active groups Group prefixes
204.69.248.224 auto-rp    180      124          6 224.0.0.0/4
```

Sample Output: show pim rps detail

```
user@host> show pim rps detail
RP: 204.69.248.224
Learned from 204.69.248.1 via: auto-rp
Time Active: 00:00:12
Holdtime: 180 with 168 remaining
Group Ranges:
    224.0.0.0/4
Active groups using RP:
    224.1.127.255
    224.2.127.253
    224.2.127.254

    total 3 groups active
```

show pim source

Syntax	show pim source <source-prefix> <brief detail>
Description	Display information about the PIM source RPF state.
Options	brief—(Optional) Display brief information. detail—(Optional) Display detailed information, including RP calculations. source-prefix—(Optional) Display the state for source RPFs in the given range. Default: brief
Required Privilege Level	view
Output Fields	RPF Address—Address of source or reverse-path. Prefix/length—Prefix and prefix length for the route used to reach the Reverse-path-forwarding address. Upstream interface—Interface toward the RPF address. Neighbor address— Address of PIM neighbor used to reach the RPF address.
Sample Output	<pre> user@host> show pim source RPF Address Prefix/length Upstream interface Neighbor address 10.10.10.101 10.10.10.101 /32 local Local 10.10.10.103 10.10.10.103 /32 so-0/1/0.0 10.10.20.10 10.10.20.121 10.10.20.0 /24 ge-0/0/0.0 Direct 10.10.30.55 10.10.30.0 /24 so-0/1/0.0 10.10.20.10 10.10.30.87 10.10.30.0 /24 so-0/1/0.0 10.10.20.10 10.10.30.103 10.10.30.0 /24 so-0/1/0.0 10.10.20.10 10.10.40.79 10.10.40.0 /24 at-3/2/0.0 10.11.20.17 10.10.40.119 10.10.40.0 /24 at-3/2/0.0 10.11.20.17 10.10.50.13 10.10.50.0 /24 ge-6/3/0.0 Direct 10.10.50.29 10.10.50.0 /24 ge-6/3/0.0 Direct 10.10.50.47 10.10.50.0 /24 ge-6/3/0.0 Direct 10.10.50.63 10.10.50.0 /24 ge-6/3/0.0 Direct </pre>
show pim statistics	
Syntax	show pim statistics <interface interface-name>
Description	Display PIM statistics.
Options	interface interface-name—(Optional) Display statistics about the specified interface. You can include wildcard characters in the interface name, as described in “Wildcard Characters in Interface Names” on page 110.
Required Privilege Level	view
See Also	clear pim statistics on page 448

Output Fields PIM statistics on all interfaces or PIM statistics for interfaces *interface-name*—Name of the interface for which the statistics are being reported.

Received—Number of received statistics.

Transmitted—Number of transmitted statistics.

Rx errors—Number of received packets that contained errors.

PIM statistics summary for all interfaces—Summary of PIM statistics for all interfaces.

Sample Output

```

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
Vl Query               2102          4203    0
Vl Register            0             0      0
Vl Register Stop       0             0      0
Vl Join Prune          14153         13074   0
Vl RP Reachability     0             0      0
Vl Assert              0             0      0
Vl Graft               0             0      0
Vl Graft Ack           0             0      0

PIM statistics summary for all interfaces:
Unknown type          0
Vl Unknown type      0
Unknown Version      0
Neighbor unknown     0
Bad Length            0
Bad Checksum          0
Bad Receive If       0
Rx Intf disabled     1998
Rx Vl Require V2     0
Rx Register not RP   0
RP Filtered Source   0
Unknown Reg Stop     0
Rx Join/Prune no state 1034
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 route upstream    0
RP mismatch           0
RPF neighbor unknown 0
    
```

show pim wildcard

Syntax	show pim wildcard
Description	Display (*,*.RP) join information.
Required Privilege Level	view
Output Fields	RP—Address of the RP. Interface—Interface on which the join arrived. Neighbor addr—Upstream neighbor. Holdtime—Lifetime of the join. Timeout—Remaining time left in the life of the join.
Sample Output	<pre> user@host> show pim wildcard RP Interface Neighbor addr Holdtime Timeout </pre>

show sap listen

Syntax	show sap listen <brief detail>
Description	Display the addresses that the router is listening to so that it receives multicast session announcements.
Options	brief—(Optional) Display brief information. detail—(Optional) Display detailed information. Default: brief
Required Privilege Level	view
Output Fields	Group address—Address of the group. Port—Port number.
Sample Output	<pre> user@host> show sap listen Group address Port 224.2.127.254 9875 239.255.255.255 9875 </pre>

test msdp

Syntax test msdp <dependent-peers *prefix* | rpf-peer *originator*>

Description Find MSDP peers.

Options dependent-peers *prefix*—(Optional) Display downstream dependent MSDP peers.
rpf-peer *originator*—(Optional) Display the MSDP reverse-path-forwarding peer for the originator.

Required Privilege Level view