



Cisco ASR 9000 Series Aggregation Services Router Multicast Command Reference, Release 4.2.x

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Preface

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- [Obtaining Documentation and Submitting a Service Request](#), page xi

Changes to This Document

This table lists the technical changes made to this document since it was first printed.

Revision	Date	Summary
OL-26040-02	June 2012	Republished with documentation updates for Cisco IOS XR Release 4.2.1 features.
OL-26040-01	December 2011	Initial release of this document.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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IGMP Commands on Cisco ASR 9000 Series Router

This chapter describes the commands used to configure and monitor IPv4 multicast protocol on Cisco ASR 9000 Series Routers .

The commands in this chapter apply to the Internet Group Management Protocol (IGMP), versions 1, 2, and 3.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the Implementing Multicast Routing on Cisco IOS XR Software configuration module in *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide* .

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access-group (IGMP)

To set limits on an interface for multicast-group join requests by hosts, use the **access-group** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

access-group *access-list*

no access-group *access-list*

Syntax Description	<i>access-list</i> Number or name of a standard IP access list. Range is 1 to 99.	
Command Default	No default behavior or values	
Command Modes	IGMP interface configuration	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If this command is not specified in router Internet Group Management Protocol (IGMP) configuration mode, the interface accepts all multicast join requests by hosts.

Task ID	Task ID	Operations
	multicast	read, write

Examples

In the following example, hosts serviced by GigabitEthernet interface 0/1/0/1 can join only group 225.2.2.2:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# ipv4 access-list mygroup permit 225.2.2.2 0.0.0.0
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# interface GigE 0/1/0/1
RP/0/RSP0/CPU0:router(config-igmp-default-if)# access-group mygroup
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# ipv4 access-list mygroup permit 225.2.2.2 0.0.0.0
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# interface GigE 0/1/0/1
RP/0/RSP0/CPU0:router(config-igmp-default-if)# access-group mygroup
```

Related Commands

Command	Description
ipv4 access-list	Defines a standard IP access list. For information, see <i>Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference</i>

clear igmp counters

To clear IGMP traffic statistics, use the **clear igmp counters** command in EXEC mode.

clear igmp [**ipv4 vrf** *vrf-name*| **vrf** *vrf-name*] **counters**

Syntax Description

ipv4	(Optional) Specifies IPv4 addressing. IPv4 is the default for Internet Group Management Protocol (IGMP) groups.
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

After IGMP statistics are cleared, statistics begin incrementing again.

Task ID

Task ID	Operations
multicast	execute

Examples

The following example shows sample output before and after clearing IGMP traffic statistics:

```
RP/0/RSP0/CPU0:router# show igmp traffic
```

```
IGMP Traffic Counters
Elapsed time since counters cleared: 00:00:19
```

	Received	Sent
Valid IGMP Packets	0	12
Queries	0	3
Reports	0	9
Leaves	0	0
Mtrace packets	0	0

clear igmp counters

```

DVMRP packets          0          0
PIM packets            0          0

Errors:
Malformed Packets      0
Bad Checksums          0
Socket Errors          0
Bad Scope Errors       0
Auxiliary Data Len Errors 0
Subnet Errors          0
Packets dropped due to invalid socket 0
Packets which couldn't be accessed    0
Other packets drops    0

```

```
RP/0/RSP0/CPU0:router# clear igmp counters
```

```
RP/0/RSP0/CPU0:router# show igmp traffic
```

```

IGMP Traffic Counters
Elapsed time since counters cleared: 00:00:12

Received Sent
Valid IGMP Packets      0      1
Queries                 0      1
Reports                 0      0
Leaves                  0      0
Mtrace packets          0      0
DVMRP packets           0      0
PIM packets             0      0

Errors:
Malformed Packets      0
Bad Checksums          0
Socket Errors          0
Bad Scope Errors       0
Auxiliary Data Len Errors 0
Subnet Errors          0
Packets dropped due to invalid socket 0
Packets which couldn't be accessed    0
Other packets drops    0

```

Related Commands

Command	Description
show igmp traffic, on page 47	Displays all the Internet Group Management Protocol (IGMP) traffic-related counters.

clear igmp group

To clear Internet Group Management Protocol (IGMP) groups on one or all interfaces, use the **clear igmp group** command in EXEC mode.

clear igmp [**ipv4** **vrf** *vrf-name*| **vrf** *vrf-name*] **group** [*ip-address*| *type interface-path-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 addressing. IPv4 is the default for IGMP groups.
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
<i>ip-address</i>	(Optional) IP hostname or group address.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

If no group address is specified, all IGMP groups are cleared.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To clear all IGMP groups, use the **clear igmp group** command without using an argument. To clear a particular group, use the *ip-address* or *type interface-path-id* arguments.

The following groups cannot be cleared:

- 224.0.0.2
- 224.0.0.13

clear igmp group

- 224.0.0.22
- 224.0.0.40

Task ID

Task ID	Operations
multicast	execute

Examples

The following example uses the **show igmp groups** command to display the IGMP Connected Group Membership, the **clear igmp group** command to clear address 239.1.1.1, and the **show igmp groups** command again to display the updated list.

```
RP/0/RSP0/CPU0:router# show igmp groups tenGigE 0/4/0/0
```

```
IGMP Connected Group Membership
Group Address    Interface          Uptime    Expires    Last Reporter
224.0.0.2        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.5        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.6        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.13       TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.22       TenGigE0/4/0/0    3w6d      never      10.114.8.44
```

```
RP/0/RSP0/CPU0:router# clear igmp groups tenGigE 0/4/0/0
```

```
RP/0/RSP0/CPU0:router# show igmp groups tenGigE 0/4/0/0
```

```
IGMP Connected Group Membership
Group Address    Interface          Uptime    Expires    Last Reporter
224.0.0.2        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.5        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.6        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.13       TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.22       TenGigE0/4/0/0    3w6d      never      10.114.8.44
```

Related Commands

Command	Description
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through Internet Group Management Protocol (IGMP).

clear igmp reset

To clear all Internet Group Management Protocol (IGMP) membership entries and reset connection in the Multicast Routing Information Base (MRIB), use the **clear igmp reset** command in EXEC mode.

clear igmp [**ipv4 vrf** *vrf-name*| **vrf** *vrf-name*] **reset**

Syntax Description

ipv4	(Optional) Specifies IPv4 addressing. IPv4 is the default for IGMP groups.
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Every IGMP group membership that IGMP learns is downloaded to the MRIB database.

The **clear igmp reset** command is used to clear all information from the IGMP topology table and reset the MRIB connection.



Note

This command is reserved to force synchronization of IGMP and MRIB entries when communication between the two components is malfunctioning.

Task ID

Task ID	Operations
multicast	execute

 `clear igmp reset`

Examples

The following example shows how to clear the group memberships in MRIB:

```
RP/0/RSP0/CPU0:router# clear igmp reset
```

Related Commands

Command	Description
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through IGMP
show mrib route	Displays all route entries in the MRIB table.

explicit-tracking

To configure explicit host tracking under Internet Group Management Protocol (IGMP) Version 3, use the **explicit-tracking** command in the appropriate configuration mode. To disable explicit host tracking, use the **no** form of this command.

explicit-tracking [*access-list*] **disable**

no explicit-tracking

Syntax Description

<i>access-list</i>	(Optional) Access list that specifies the group range for host tracking.
disable	(Optional) Disables explicit host tracking on a specific interface. This option is available only in interface configuration mode.

Command Default

If this command is not specified in IGMP configuration mode, then explicit host tracking is disabled.

Command Modes

IGMP VRF configuration
IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, IGMP supports Version 3, unless a Version 2 or Version 1 IGMP host message is detected in the network. For backward compatibility, IGMP downgrades to run at the IGMP version level that is installed.

This feature allows the router to achieve minimal leave latencies when hosts leave a multicast group or channel. To monitor IGMP membership of hosts, use the **show igmp groups** command in EXEC mode.

In router configuration mode, the **explicit-tracking** command enables explicit host tracking for all interfaces. To disable explicit tracking for all interfaces, use the **no** form of the command from IGMP configuration mode. To disable the feature on specific interfaces, use the **explicit-tracking** command in interface configuration mode with the **disable** keyword, as shown in the following example.

**Note**

If you configure this command in IGMP VRF configuration mode, parameters are inherited by all new and existing interfaces. However, you can override these parameters on individual interfaces from IGMP interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable explicit host tracking for the access list named router1 on all interfaces and how to disable explicit host tracking for a specific GigabitEthernet interface:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# explicit-tracking router1
RP/0/RSP0/CPU0:router(config-igmp)# interface GigabitEthernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# explicit-tracking disable
```

Related Commands

Command	Description
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through Internet Group Management Protocol (IGMP).

join-group

To have the router join a multicast group, use the **join-group** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

join-group *group-address* [*source-address*]

no join-group *group-address* [*source-address*]

Syntax Description

<i>group-address</i>	Address of the multicast group. This is a multicast IP address group in IPv4 format IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .
<i>source-address</i>	(Optional) Source address of the multicast group to include in IPv4 prefixing format IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .

Command Default

No multicast group memberships are predefined. If not specified, include is the default.

Command Modes

IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **join-group** command permits the IP packets that are addressed to the group address to pass to the IP client process in the Cisco IOS XR software.

If all the multicast-capable routers that you administer are members of a multicast group, pinging that group causes all routers to respond. This command can be a useful administrative and debugging tool.

Another reason to have a router join a multicast group is when other hosts on the network are prevented from correctly answering IGMP queries. When the router joins the multicast group, upstream devices learn multicast routing table information for that group and keep the paths for that group active.

**Caution**

Joining a multicast group can result in a significant performance impact, because all subscribed multicast packets are punted to the route processor.

Task ID

Task ID	Operations
multicast	read, write

Examples

In the following example, the router joins multicast group 225.2.2.2:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# interface GigabitEthernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# join-group 225.2.2.2
```

The **join-group** command can have an include/exclude mode for IGMPv3 interfaces as shown in the following example:

```
RP/0/RSP0/CPU0:router(config)#router igmp
RP/0/RSP0/CPU0:router(config-igmp)#int gigabitEthernet 0/5/0/1
RP/0/RSP0/CPU0:router(config-igmp-default-if)#join-group ?
A.B.C.D IP group address
RP/0/RSP0/CPU0:router(config-igmp-default-if)#join-group 225.0.0.0 ?
A.B.C.D Source address to include
exclude Exclude the only following source address include Include only the following
source address <cr>
RP/0/RSP0/CPU0:router(config-igmp-default-if)#join-group 225.0.0.0 10.10.10.10 ?
<cr>
RP/0/RSP0/CPU0:router(config-igmp-default-if)#join-group 225.0.0.0 ?
A.B.C.D Source address to include
exclude Exclude the only following source address
include Include only the following source address <cr>
RP/0/RSP0/CPU0:router(config-igmp-default-if)#join-group 225.0.0.0
```

Related Commands

Command	Description
ping	Checks host reachability and network connectivity on IP networks. For information, see <i>Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference</i> .

maximum groups

To configure the maximum number of groups used by Internet Group Management Protocol (IGMP) and accepted by a router, use the **maximum groups** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

maximum groups *number*

no maximum groups

Syntax Description

<i>number</i>	Maximum number of groups accepted by a router. Range is 1 to 75000.

Command Default

number : 50000

Command Modes

IGMP configuration

IGMP VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When configuring this command within IGMP VRF configuration mode, you may either use the default (unspecified) VRF or a specific VRF by specifying its name.

The maximum combined number of groups on all interfaces can be 75000. After the maximum groups value is met, all additional memberships learned are ignored. The maximum number includes external and local membership.

The following groups obtain local membership on each interface when multicast is enabled and are added into the group totals for each interface: 224.0.0.13 (for PIM), 224.0.0.22 and 224.0.0.2 (for IGMP).

You cannot use the **maximum groups** command to configure the maximum number of groups below the number of existing groups. For instance, if the number of groups is 39, and you set the maximum number of groups to 10, the configuration is rejected.

Although Cisco IOS XR Software Release 3.9.0 supports 40,000 groups per interface, the ASR9000 router supports a maximum of 16,000 multicast routes per system.

Furthermore, you can use the **maximum groups per-interface** command to configure the maximum number of groups for each interface accepted by a router.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to display the number of groups (39) and the maximum number of groups configured (50000). Through use of the **maximum groups** command, a configuration is committed to change the maximum number of groups to 40. Before and after configuration, the **show igmp summary** command is used to confirm the configuration change:

```
RP/0/RSP0/CPU0:router# show igmp summary
```

```
IGMP summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 50000
```

```
Supported Interfaces    : 18
Unsupported Interfaces  : 2
Enabled Interfaces      : 18
Disabled Interfaces     : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RSP0/CPU0/0	0	25000
Loopback0	4	25000
Bundle-Ether24	3	25000
Bundle-Ether28	3	25000
Bundle-Ether28.1	3	25000
Bundle-Ether28.2	3	25000
Bundle-Ether28.3	3	25000
MgmtEth0/RP1/CPU0/0	0	25000
GigabitEthernet0/1/5/0	3	25000
GigabitEthernet0/1/5/1	5	25000
GigabitEthernet0/1/5/2	5	25000
GigabitEthernet0/1/0/1	5	25000
GigabitEthernet0/1/4/2	3	25000
GigabitEthernet0/6/5/1	3	25000
GigabitEthernet0/6/5/2	3	25000
GigabitEthernet0/6/5/7	3	25000
GigabitEthernet0/6/0/1	3	25000
GigabitEthernet0/6/4/4	3	25000
GigabitEthernet0/6/4/5	3	25000
GigabitEthernet0/6/4/6	3	25000

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# maximum groups 65
RP/0/RSP0/CPU0:router(config-igmp)# commit
```

```
RP/0/RSP0/CPU0:router:May 13 12:26:59.108 : config[65704]: %LIBTARCFG-6-COMMIT : Configuration
committed
by user 'cisco'. Use 'show commit changes 1000000025' to view the changes.
```

```
RP/0/RSP0/CPU0:router# show igmp summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 65
```

```
Supported Interfaces    : 18
Unsupported Interfaces  : 2
Enabled Interfaces      : 18
Disabled Interfaces     : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RSP0/CPU0/0	0	25000
Loopback0	4	25000
Bundle-Ether28	3	25000
Bundle-Ether28.1	3	25000
Bundle-Ether28.2	3	25000
Bundle-Ether28.3	3	25000
MgmtEth0/RP1/CPU0/0	0	25000
GigabitEthernet0/1/5/0	3	25000
GigabitEthernet0/1/5/1	5	25000
GigabitEthernet0/1/5/2	5	25000
GigabitEthernet0/6/5/1	3	25000
GigabitEthernet0/6/5/2	3	25000
GigabitEthernet0/6/5/7	3	25000

Related Commands

Command	Description
maximum groups-per-interface, on page 18	Configures the maximum number of groups for each interface accepted by a router.
show igmp summary, on page 43	Displays group membership information for Internet Group Management Protocol (IGMP).

maximum groups-per-interface

To configure the maximum number of groups for each interface accepted by a router, use the **maximum groups-per-interface** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

maximum groups-per-interface *number*

no maximum groups-per-interface

Syntax Description

<i>number</i>	Maximum number of groups accepted by a router for each interface. Range is 1 to 16000.

Command Default

number : 20000

Command Modes

IGMP configuration
IGMP VRF configuration
IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following groups obtain local membership on each interface when multicast is enabled and are added into the group totals for each interface: 224.0.0.13 (for Protocol Independent Multicast [PIM]), 224.0.0.22 and 224.0.0.2 (for Internet Group Management Protocol [IGMP]). The number of groups for each interface reflects both external and local group membership.



Note

You cannot use the **maximum groups-per-interface** command to configure the maximum number of groups for each interface below the number of existing groups on an interface. For example, if the number of groups is 39, and you set the maximum number of groups to 10, the configuration is rejected.

When you use the **maximum groups-per-interface** command for a specific interface, it overrides the inheritance property of this command specified under IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to display the maximum number of groups for each interface. A configuration is committed to change the maximum number of groups for each interface to 12. Before and after configuration, use the **show igmp summary** command to confirm the configuration change:

```
RP/0/RSP0/CPU0:router# show igmp summary
```

```
IGMP summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 50000
```

```
Supported Interfaces   : 18
Unsupported Interfaces : 2
Enabled Interfaces     : 18
Disabled Interfaces    : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RSP0/CPU0/0	0	25000
Loopback0	4	25000
Bundle-Ether28	3	25000
Bundle-Ether28.1	3	25000
Bundle-Ether28.2	3	25000
Bundle-Ether28.3	3	25000
MgmtEth0/RP1/CPU0/0	0	25000
GigabitEthernet0/1/5/0	3	25000
GigabitEthernet0/1/5/1	5	25000
GigabitEthernet0/1/5/2	5	25000
GigabitEthernet0/6/5/1	3	25000
GigabitEthernet0/6/5/2	3	25000
GigabitEthernet0/6/5/7	3	25000

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# maximum groups-per-interface 5
RP/0/RSP0/CPU0:router(config-igmp)# commit
```

```
RP/0/RSP0/CPU0:router# show igmp summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 65
```

```
Supported Interfaces   : 18
Unsupported Interfaces : 2
Enabled Interfaces     : 18
Disabled Interfaces    : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RSP0/CPU0/0	0	5
Loopback0	4	5
Bundle-Ether28	3	5
Bundle-Ether28.1	3	5
Bundle-Ether28.2	3	5
Bundle-Ether28.3	3	5
MgmtEth0/RP1/CPU0/0	0	5
GigabitEthernet0/1/5/0	3	5
GigabitEthernet0/1/5/1	5	5

maximum groups-per-interface

```
GigabitEthernet0/1/5/2    5      5
GigabitEthernet0/6/5/1    3      5
GigabitEthernet0/6/5/2    3      5
GigabitEthernet0/6/5/7    3      5
```

The following example shows how to configure all interfaces with 3000 maximum groups per interface except GigabitEthernet interface 0/4/0/0, which is set to 4000:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# maximum groups-per-interface 3000
RP/0/RSP0/CPU0:router(config-igmp)# interface GigabitEthernet 0/4/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# maximum groups-per-interface 4000
IGMP summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 50000
```

```
Supported Interfaces    : 18
Unsupported Interfaces  : 2
Enabled Interfaces      : 18
Disabled Interfaces     : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RP0/CPU0/0	0	25000
Loopback0	4	25000
Bundle-POS24	3	25000
Bundle-Ether28	3	25000
Bundle-Ether28.1	3	25000
Bundle-Ether28.2	3	25000
Bundle-Ether28.3	3	25000
MgmtEth0/RP1/CPU0/0	0	25000
GigabitEthernet0/1/5/0	3	25000
GigabitEthernet0/1/5/1	5	25000
GigabitEthernet0/1/5/2	5	25000
POS0/1/0/1	5	25000
POS0/1/4/2	3	25000
GigabitEthernet0/6/5/1	3	25000
GigabitEthernet0/6/5/2	3	25000
GigabitEthernet0/6/5/7	3	25000
POS0/6/0/1	3	25000
POS0/6/4/4	3	25000
POS0/6/4/5	3	25000
POS0/6/4/6	3	25000

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# maximum groups-per-interface 5
RP/0/RSP0/CPU0:router(config-igmp)# commit
RP/0/RSP0/CPU0:router# show igmp summary
```

```
Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 65
```

```
Supported Interfaces    : 18
Unsupported Interfaces  : 2
Enabled Interfaces      : 18
Disabled Interfaces     : 2
```

Interface	Grp No	Max Grp No
MgmtEth0/RP0/CPU0/0	0	5
Loopback0	4	5
Bundle-POS24	3	5
Bundle-Ether28	3	5
Bundle-Ether28.1	3	5
Bundle-Ether28.2	3	5
Bundle-Ether28.3	3	5
MgmtEth0/RP1/CPU0/0	0	5
GigabitEthernet0/1/5/0	3	5
GigabitEthernet0/1/5/1	5	5


```
GigabitEthernet0/1/5/2      5      5
POS0/1/0/1                 5      5
POS0/1/4/2                 3      5
GigabitEthernet0/6/5/1      3      5
GigabitEthernet0/6/5/2      3      5
GigabitEthernet0/6/5/7      3      5
POS0/6/0/1                 3      5
POS0/6/4/4                 3      5
POS0/6/4/5                 3      5
POS0/6/4/6                 3      5
```

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# maximum groups-per-interface 3000
RP/0/RSP0/CPU0:router(config-igmp)# interface POS 0/4/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# maximum groups-per-interface 4000
```

Related Commands

Command	Description
maximum groups, on page 15	Configures the maximum number of groups used by Internet Group Management Protocol (IGMP) .
show igmp summary, on page 43	Displays group membership information for Internet Group Management Protocol (IGMP).

nsf lifetime (IGMP)

To configure the maximum time for the nonstop forwarding (NSF) timeout on the Internet Group Management Protocol (IGMP) process, use the **nsf lifetime** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

nsf lifetime *seconds*

no nsf lifetime

Syntax Description

<i>seconds</i>	Maximum time for NSF mode. Range is 10 to 3600 seconds.

Command Default

seconds : 60

Command Modes

IGMP configuration
IGMP VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The IGMP NSF process is triggered by the restart of the IGMP process. While in IGMP NSF mode, the Multicast Routing Information Base (MRIB) purges the routes installed by the previous IGMP process when the IGMP NSF process times out.

The IGMP NSF lifetime is the period for IGMP to relearn all the host membership of the attached network through membership queries and reports. During this NSF period, PIM continues to maintain forwarding state for the local members while IGMP recovers their membership reports.

Additionally, IGMP recovers the internal receiver state from Local Packet Transport Services (LPTS) for IP group member applications (including the Session Announcement Protocol (SAP) Listener) and updates the MRIB.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set the IGMP NSF timeout value to 120 seconds:

```
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# nsf lifetime 120
```

Related Commands

Command	Description
nsf (multicast)	Enables NSF capability for the multicast routing system.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf, on page 41	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.

query-interval

To configure the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages, use the **query-interval** command in the appropriate configuration mode. To return to the default frequency, use the **no** form of this command.

query-interval *seconds*

no query-interval

Syntax Description

<i>seconds</i>	Frequency used to send IGMP host-query messages. Range is 1 to 3600.

Command Default

If this command is not specified in interface configuration mode, the interface adopts the query interval parameter specified in IGMP configuration mode.

If this command is not specified in IGMP configuration mode, the query interval time is 60 seconds.

Command Modes

IGMP VRF configuration

IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Multicast routers send host membership query messages (host-query messages) to discover which multicast groups have members on the attached networks of the router. Hosts respond with IGMP report messages indicating that they want to receive multicast packets for specific groups (that is, that the host wants to become a member of the group). Host-query messages are addressed to the all-hosts multicast group, which has the address 224.0.0.1, and has an IP time-to-live (TTL) value of 1.

The designated router for a LAN is the only router that sends IGMP host-query messages:

- For IGMP Version 1 (only), the designated router is elected according to the multicast routing protocol that runs on the LAN.
- For IGMP Versions 2 and 3, , the designated querier is the lowest IP-addressed multicast router on the subnet.

If the router hears no queries for the timeout period (controlled by the [query-timeout](#), on page 28 command), it becomes the querier.

**Note**

Changing the value of the *seconds* argument may severely impact network performance. A short query interval may increase the amount of traffic on the attached network, and a long query interval may reduce the querier convergence time.

**Note**

If you configure the **query-interval** command in IGMP configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces from interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to change the frequency at which the designated router sends IGMP host-query messages to 2 minutes:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# interface gigabitEthernet
0/1/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# query-interval 120
```

Related Commands

Command	Description
hello-interval (PIM)	Configures the frequency of PIM hello messages.
query-timeout, on page 28	Configures the timeout value before the router takes over as the querier for the interface.
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through IGMP.

query-max-response-time

To configure the maximum response time advertised in Internet Group Management Protocol (IGMP) queries, use the **querymax-response-time** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

query-max-response-time *seconds*

no query-max-response-time

Syntax Description

<i>seconds</i>	Maximum response time, in seconds, advertised in IGMP queries. Range is 1 to 12.

Command Default

If this command is not specified in interface configuration mode, the interface adopts the maximum response time parameter specified in IGMP configuration mode.

If this command is not specified in IGMP configuration mode, the maximum response time is 10 seconds.

Command Modes

IGMP VRF configuration

IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **query-max-response-time** command is not supported on IGMP Version 1.

This command is used to control the maximum response time for hosts to answer an IGMP query message. Configuring a value less than 10 seconds enables the router to prune groups much faster, but this action results in network burstiness because hosts are restricted to a shorter response time period.

If you configure this command in IGMP configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces in interface configuration mode.



Note

If the hosts do not read the maximum response time in the query message correctly, group membership might be pruned inadvertently. Therefore, the hosts must know to respond faster than 10 seconds (or the value you configure).

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a maximum response time of 8 seconds:

```
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0  
RP/0/RSP0/CPU0:router(config-igmp-default-if)# query-max-response-time 8
```

Related Commands

Command	Description
hello-interval (PIM)	Configures the frequency of PIM hello messages.
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through IGMP.

query-timeout

To configure the timeout value before the router takes over as the querier for the interface, use the **query-timeout** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

query-timeout *seconds*

no query-timeout

Syntax Description

<i>seconds</i>	Number of seconds that the router waits after the previous querier has stopped querying before it takes over as the querier. Range is 60 to 300.

Command Default

If this command is not specified in interface configuration mode, the interface adopts the timeout value parameter specified in IGMP VRF configuration mode. If this command is not specified in IGMP VRF configuration mode, the maximum response time is equal to twice the query interval set by the **query-interval** command.

Command Modes

IGMP VRF configuration
IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **query timeout** command is not supported on Internet Group Management Protocol (IGMP) Version 1. By default, the router waits twice the query interval specified by the **query-interval** command, after which, if the router has heard no queries, it becomes the querier. By default, the query interval is 60 seconds, which means that the **query timeout** value defaults to 120 seconds.

If you configure a query timeout value less than twice the query interval, routers in the network may determine a query timeout and take over the querier without good reason.



Note

If you configure this command in IGMP configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces in interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router to wait 30 seconds from the time it received the last query before it takes over as the querier for the interface:

```
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0  
RP/0/RSP0/CPU0:router(config-igmp-default-if)# query-timeout 30
```

Related Commands

Command	Description
query-interval, on page 24	Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages.

robustness-count

To set the robustness variable to tune for expected packet loss on a network, use the **robustness-count** command in the appropriate configuration mode. To return to the default setting, use the **no** form of this command.

robustness-count *count*

no robustness-count

Syntax Description

<i>count</i>	Value of the robustness count variable. Range is 2 to 10 packets.

Command Default

Default is 2 packets.

Command Modes

IGMP VRF configuration
IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

IGMP is a soft-state protocol. State must be periodically refreshed or it times out. At a **robustness-count** command setting, for example, of 4, a network might lose three IGMP packets related to some specific state yet still maintain the state. If, however, a network lost more than three IGMP packets in the sequence, the state would time out. You might then consider changing the **robustness-count** setting to maintain state.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example illustrates the use of the **robustness-count** command:

```
RP/0/RSP0/CPU0:router(config)# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# robustness-count 2
```

router

To disable or enable Internet Group Management Protocol (IGMP) membership tracking, use the **router** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

router {**disable**| **enable**}

no router {**disable**| **enable**}

Syntax Description

disable	Turns off IGMP membership tracking.
enable	Turns on IGMP membership tracking.

Command Default

If this command is not specified in IGMP VRF configuration mode, router functionality is enabled on all interfaces.

Command Modes

IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **router** command is used to enable and disable the IGMP router functionality on a specific interface. For instance, IGMP stops queries from an interface when the router functionality is disabled on that interface. Disabling IGMP router functionality does not prevent local group membership from being announced through the group membership report.



Note

This command is useful if you want to disable or enable IGMP interfaces that have been previously enabled through the **mcast-routing** command.

Task ID

Task ID	Operations
mcast	read, write

Examples

The following example shows how to enable IGMP membership tracking functionality on all multicast enabled interfaces, except Packet-over-SONET/SDH (POS) interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0  
RP/0/RSP0/CPU0:router(config-igmp-default-if)# router enable
```

Related Commands

Command	Description
multicast routing	Enables multicast routing and forwarding on all enabled interfaces of the router and enters multicast routing configuration mode.

router igmp

To enter Internet Group Management Protocol (IGMP) configuration mode, use the **router igmp** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

router igmp

no router igmp

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Default Global configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

From IGMP VRF configuration mode, you can configure the maximum response time advertised in IGMP queries and modify the host query interval.



Note The IGMP process is turned on when the **router igmp** command or the **multicast-routing** command is initiated.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enter IGMP configuration mode:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)#
```

Related Commands

Command	Description
interface all disable	Disables IGMP membership tracking on all interfaces.
multicast routing	Enables multicast routing and forwarding on all enabled interfaces of the router and enters multicast routing configuration mode.

show igmp groups

To display the multicast groups that are directly connected to the router and that were learned through Internet Group Management Protocol (IGMP), use the **show igmp groups** command in EXEC mode.

show igmp [*vrf vrf-name*] **groups** [*group-address*| *type interface-path-id*] **not-active** **summary**] [**detail**] [**explicit**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
<i>group-address</i>	(Optional) Address or name of the multicast group. An address is a multicast IP address in four-part dotted-decimal notation. A name is as defined in the Domain Name System (DNS) hosts table.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Either a physical interface or a virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
not-active	(Optional) Displays group joins that are not processed.
summary	(Optional) Displays the total number of (*, G) and (S, G) states in IGMP.
detail	(Optional) Displays detail information such as IGMP Version 3 source list, host, and router mode.
explicit	(Optional) Displays explicit tracking information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

show igmp groups**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you omit all optional arguments, the **show igmp groups** command displays (by group address and interface name) all the multicast memberships that the directly connected networks have subscribed.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show igmp groups** command on a specific (tenGigE) interface:

```
RP/0/RSP0/CPU0:router# show igmp groups tenGigE 0/4/0/0
```

```
IGMP Connected Group Membership
Group Address    Interface          Uptime    Expires    Last Reporter
224.0.0.2        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.5        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.6        TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.13       TenGigE0/4/0/0    3w6d      never      10.114.8.44
224.0.0.22       TenGigE0/4/0/0    3w6d      never      10.114.8.44
```

This table describes the significant fields shown in the display.

Table 1: show igmp groups Field Descriptions

Field	Description
Group Address	Address of the multicast group.
Interface	Interface through which the group is reachable.
Uptime	How long (in hours, minutes, and seconds) this multicast group has been known.
Expires	How long (in hours, minutes, and seconds) until the entry is removed from the IGMP groups table.
Last Reporter	Last host to report being a member of the multicast group.

Related Commands

Command	Description
show igmp interface , on page 37	Displays Internet Group Management Protocol (IGMP) multicast-related information about an interface.

show igmp interface

To display Internet Group Management Protocol (IGMP) multicast-related information about an interface, use the **show igmp interface** command in EXEC mode.

show igmp [*vrf vrf-name*] **interface** [*type interface-path-id*] **state-on**| **state-off**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Either a physical interface or a virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
state-on	(Optional) Displays all interfaces with IGMP enabled.
state-off	(Optional) Displays all interfaces with IGMP disabled.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you omit the optional arguments, the **show igmp interface** command displays information about all interfaces.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show igmp interface** command:

```
RP/0/RSP0/CPU0:router# show igmp interface

Loopback0 is up, line protocol is up
  Internet address is 10.144.144.144/32
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
  IGMP activity: 3 joins, 0 leaves
  IGMP querying router is 10.144.144.144 (this system)
TenGigE0/4/0/0 is up, line protocol is up
  Internet address is 10.114.8.44/24
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
  IGMP activity: 9 joins, 4 leaves
  IGMP querying router is 10.114.8.11
Bundle-Ether16.162 is up, line protocol is up
  Internet address is 10.194.8.44/24
  IGMP is disabled on interface
Bundle-Ether16.163 is up, line protocol is up
  Internet address is 10.194.12.44/24
  IGMP is disabled on interface
GigabitEthernet0/1/0/2 is up, line protocol is up
  Internet address is 10.147.4.44/24
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
  IGMP activity: 6 joins, 0 leaves
  IGMP querying router is 10.147.4.44 (this system)
GigabitEthernet0/1/0/8 is up, line protocol is up
  Internet address is 10.146.4.44/24
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
  IGMP activity: 5 joins, 0 leaves
  IGMP querying router is 10.146.4.44 (this system)
GigabitEthernet0/1/0/18 is up, line protocol is up
  Internet address is 10.194.4.44/24
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
  IGMP activity: 7 joins, 2 leaves
  IGMP querying router is 10.194.4.19
GigabitEthernet0/1/0/23 is up, line protocol is up
  Internet address is 10.114.4.44/24
  IGMP is enabled on interface
  Current IGMP version is 3
  IGMP query interval is 60 seconds
  IGMP querier timeout is 125 seconds
  IGMP max query response time is 10 seconds
  Last member query response interval is 1 seconds
```

```

IGMP activity: 9 joins, 4 leaves
IGMP querying router is 10.114.4.11
GigabitEthernet0/1/0/27 is up, line protocol is up
Internet address is 10.145.4.44/24
IGMP is enabled on interface
Current IGMP version is 3
IGMP query interval is 60 seconds
IGMP querier timeout is 125 seconds
IGMP max query response time is 10 seconds
Last member query response interval is 1 seconds
IGMP activity: 7 joins, 2 leaves
IGMP querying router is 10.145.4.44 (this system)

```

This table describes the significant fields shown in the display.

Table 2: show igmp interface Field Descriptions

Field	Description
Loopback0 is up, line protocol is up	Interface type, number, and status.
Internet address is	Internet address of the interface and subnet mask being applied to the interface, as specified with the address command.
IGMP is enabled on interface	Indicates whether IGMP router functionality has been enabled on the interface. Note Multicast protocols do not run on Management Ethernet interfaces even if they are enabled with the CLI.
IGMP query interval is 60 seconds	Interval at which the Cisco IOS XR software sends Protocol Independent Multicast (PIM) query messages, as specified with the query-interval command.
IGMP querier timeout is...	Timeout that is set by nonquerier routers. When this timeout expires, the nonquerier routers begin to send queries.
IGMP max query response time is...	Query response time, in seconds, that is used by administrators to tune the burstiness of IGMP messages on the network. This is the maximum time within which a response to the query is received.
Last member query response is...	Query response time in seconds since a host replied to a query that was sent by the querier.
IGMP activity:	Total number of joins and total number of leaves received.
IGMP querying router is 239.122.41.51 (this system)	Indicates the elected querier on the link.

Related Commands

Command	Description
address	Sets a primary or secondary IP address for an interface.
query-interval, on page 24	Configures the frequency at which Cisco IOS XR software sends IGMP host-query messages.
router, on page 31	Disables or enables IGMP membership tracking.

show igmp nsf

To display the state of the nonstop forwarding (NSF) operation in Internet Group Management Protocol (IGMP), use the **show igmp nsf** command in EXEC mode.

show igmp [*vrf vrf-name*] **nsf**

Syntax Description

old-output	(Optional) Displays the old show output—available for backward compatibility.
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show igmp nsf** command displays the current multicast NSF state for IGMP. The NSF state that is displayed may be either normal or activated for NSF. The activated state indicates that recovery is in progress due to an IGMP failure. The total NSF timeout and time remaining are displayed until NSF expiration.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show igmp nsf** command:

```
RP/0/RSP0/CPU0:router# show igmp nsf
```

```
IGMP_AFD
Non-Stop Forwarding Status: Multicast routing state: Normal
```

```
show igmp nsf
```

```
NSF Lifetime
:           00:01
:00
```

This table describes the significant fields shown in the display.

Table 3: show igmp nsf Field Descriptions

Field	Description
Multicast routing state	Multicast NSF status of IGMP (Normal or Non-Stop Forwarding Activated).
NSF Lifetime	Timeout for IGMP NSF. IGMP remains in the NSF state, recovering the IGMP route state through IGMP reports for this period of time, before making the transition back to the normal state and signaling the Multicast Routing Information Base (MRIB).
NSF Time Remaining	If IGMP NSF state is activated, the time remaining until IGMP reverts to Normal mode displays.

Related Commands

Command	Description
nsf (multicast)	Enables NSF capability for the multicast routing system.
nsf lifetime (IGMP) , on page 22	Configures the NSF timeout value for the IGMP or MLD process. Configures the NSF timeout value for the IGMP process.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.
show mrrib nsf	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show igmp summary

To display group membership information for Internet Group Management Protocol (IGMP), use the **show igmp summary** command in EXEC mode.

show igmp [vrf vrf-name] summary

Syntax Description

old-output	(Optional) Displays the old show output—available for backward compatibility.
vrf vrf-name	(Optional) Specifies a VPN routing and forwarding (VRF) instance.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show igmp summary** command is used to display the total group membership. The value for number of groups is the total number of group members on all interfaces. The value for maximum number of groups is the total number of external and local members possible for all interfaces. The maximum number of groups and the default value for the maximum number of groups is 50000 members. The maximum number of groups for each interface, and the default value for the maximum number of groups for each interface, is 25000 members.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows the number of groups for each interface that are IGMP members and the maximum number of groups that can become members on each interface:

```
RP/0/RSP0/CPU0:router# show igmp summary
```

show igmp summary

```

IGMP summary

Robustness Value 2
No. of Group x Interfaces 61
Maximum number of Group x Interfaces 65

Supported Interfaces   : 18
Unsupported Interfaces : 2
Enabled Interfaces    : 18
Disabled Interfaces   : 2

Interface

Grp No

  Max Grp No
Bundle-Ether28.1      3      5
MgmtEth0/RSP0/CPU0/0

0
  5
Loopback0

  4
  5
MgmtEth0/RP1/CPU0/0   0      5
Bundle-Ether28
  3      5
Bundle-Ether28

3
  5
Bundle-Ether28.1

3
  5
Bundle-Ether28.2

3
  5
Bundle-Ether28.3
  3      5
MgmtEth0
/RP1
/CPU0
/0

  0
  5
GigabitEthernet0/1
/5/0
  3      5
GigabitEthernet0/1
/5/1

5
  5
GigabitEthernet0
/1
/5
/2

5
  5
GigabitEthernet0
/6/5
/1
  3      5
GigabitEthernet0
/6/5
/2

```



```

      3          5
GigabitEthernet0
/6/5
/7
      3          5

```

This table describes the significant fields shown in the display.

Table 4: show igmp summary Field Descriptions

Field	Description
No. of Group x Interfaces	Number of multicast groups that are joined through the interface.
Maximum number of Group x Interfaces	Maximum number of multicast groups that can be joined through the interface.
Supported Interfaces	Interfaces through which the multicast groups are reachable.
Unsupported Interfaces	Number of unsupported interfaces.
Enabled Interfaces	Number of enabled interfaces.
Disabled Interfaces	Number of disabled interfaces.

Related Commands

Command	Description
show igmp groups, on page 35	Displays the multicast groups that are directly connected to the router and that were learned through Internet Group Management Protocol (IGMP).

show igmp ssm map

To query the source-specific mapping (SSM) state, use the **show igmp ssm map** command in EXEC mode.

show igmp [*vrf vrf-name*] **ssm map** [*group-address*] [**detail**]

Syntax Description

vrf	(Optional) Specifies a VPN routing and forwarding (VRF) instance to be queried.
<i>vrf-name</i>	(Optional) Specifies the name of the specific VRF instance.
<i>group-address</i>	(Optional) Specifies the address of the SSM group for which to obtain the mapping state.
detail	(Optional) Displays detailed source information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following example illustrates the use of the **show igmp ssm map** command:

```
RP/0/RSP0/CPU0:router# show igmp ssm map 232.1.1.1
```

```
232.1.1.1 is static with 1 source
```

show igmp traffic

To display all the Internet Group Management Protocol (IGMP) traffic-related counters, use the **show igmp traffic** command in EXEC mode.

show igmp [*vrf vrf-name*] **traffic**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show igmp traffic** command is used to display the state of all counters for IGMP traffic. It gives information about the length of time the counters have been active and the count of different types of IGMP packets received, such as queries, leaves, and reports. Also, this command keeps a count of all the erroneous IGMP packets received.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show igmp traffic** command:

```
RP/0/RSP0/CPU0:router# show igmp traffic

IGMP Traffic Counters
Elapsed time since counters cleared: 15:27:38

Valid IGMP Packet      Received      Sent
Queries                0            2784
Reports                2784        2792
```

show igmp traffic

```

Leaves                                0          0
Mtrace packets                        0          0
DVMRP packets                         0          0
PIM packets                           0          0

Errors:
Malformed Packets                     0
Bad Checksums                         0
Socket Errors                         0
Bad Scope Errors                      0
Auxiliary Data Len Error              0
Subnet Errors                         0
Packets dropped due to invalid socket  0
Packets which couldn't be accessed    0

```

This table describes the significant fields shown in the display for the **show igmp traffic** command.

Table 5: show igmp traffic Field Descriptions

Field	Description
Valid IGMP Packet	Total number of valid protocol packets sent and received. Valid packet types include: • Queries • Membership reports • Leaves
Queries	Total number of query packets sent and received. IP Multicast routers send queries to determine the multicast reception state of neighboring interfaces.
Reports	Total number of membership report packets received. Membership reports indicate either the current multicast reception state of a neighboring interface or a change to that state.
Leaves	Total number of leaves received. A leave group packet indicates a neighboring interface no longer has multicast reception state for a particular group.
Mtrace packets	Total number of Mtrace packets sent and received. Mtrace traces the route from a receiver to a source using a particular multicast address.
DVMRP packets	Total number of Distance Vector Multicast Routing Protocol (DVMRP) packets sent and received. DVMRP is an Internet routing protocol that provides a mechanism for connectionless datagram delivery to a group of hosts across an internetwork. This protocol dynamically generates IP multicast delivery trees using Reverse Path Multicasting. Packet type 0x13 indicates a DVMRP packet.

Field	Description
PIM packets	Total number of sent and received Protocol Independent Multicast (PIM) packets.
Malformed Packets	Total number of malformed packets received. A malformed packet is a packet smaller than the smallest valid protocol packet.
Bad Checksums	Total number of packets received with a bad protocol header checksum.
Socket Errors	Total number of read and write failures on the protocol socket.
Bad Scope Errors	Total number of packets received with an invalid multicast scope. Note IGMP has no invalid scopes; this counter, therefore, never increments in IGMP.
Auxiliary Data Len Errors	Total number of packets received with a non-zero auxiliary data length.
Subnet Errors	Total number of packets received that were not sourced on the same subnet as the router. DVMRP and MTRACE packets received are not checked for this error as they may be validly sourced from a different subnet.
Packets dropped due to invalid socket	Total number of packets dropped due to an invalid socket.
Packets which couldn't be accessed	Total number of packets that could not be sent or received. This might occur if: • Packet buffer does not form a valid protocol packet. • IP header is not written to the packet. • Outgoing packet interface handle was not set. • Errors occurred calculating the protocol checksum.
Other Packet Drops	Packets dropped for any other reason.

 show igmp traffic**Related Commands**

Command	Description
show pim traffic	Displays PIM traffic counter information.

show igmp vrf vrf_name groups

To display the IGMP group membership information, use the **show igmp vrf vrf_name groups** command in the EXEC mode.

show igmp vrf vrf_name groups ip_address

Syntax Description	
<i>ip_address</i>	Specifies the IP address or group address.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read

Examples

```
RP/0/RSP0/CPU0:router# show igmp vrf vrf1 groups 232.1.1.1
IGMP Connected Group Membership
Group Address   Interface          Uptime    Expires    Last Reporter
232.1.1.1      tunnel-mte1       12:39:31  never      110.110.110.110
```

ssm map static

To map group memberships from legacy hosts in Source-Specific Multicast (SSM) groups accepted by an access control list (ACL) to a Protocol Independent Multicast (PIM)-SSM source, use the **ssm map static** command in the appropriate configuration mode. To revert to default behavior, use the **no** form of this command.

ssm map static *source-address access-list*

no ssm map static *source-address access-list*

Syntax Description

<i>source-address</i>	PIM-SSM source address to be used to create a static mapping.
<i>access-list</i>	ACL specifying the groups to be used to create a static mapping.

Command Default

Legacy host membership reports in the SSM group range are discarded.

Command Modes

IGMP VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PIM-SSM requires the use of IGMPv3 (IPv4) to determine local memberships. Under normal operating conditions, IGMP discards older version group membership reports for groups in the SSM group range. This means that a host with a legacy group membership protocol is unable to receive data from a PIM-SSM source.

The **ssm map static** command maps an older group membership report to a set of PIM-SSM sources. If the ACL associated with a configured source accepts the SSM group, then that source is included in its set of sources for the SSM group.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows PIM-SSM mapping in IGMP routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# configuration  
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# ssm map static 10.0.0.1 mc2  
RP/0/RSP0/CPU0:router(config-igmp)#
```

static-group

To configure the router to be a statically configured member of the specified group on the interface, or to statically forward for a multicast group onto the interface, use the **static-group** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

static-group *group-address* [**inc-mask** *mask count cnt*] [*source-address* [**inc-mask** *mask count cnt*]]

no static-group *group-address* [**inc-mask** *mask count cnt*] [*source-address* [**inc-mask** *mask count cnt*]]

Syntax Description

<i>group-address</i>	IP address of the multicast group in IPv4 prefixing format: IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .
inc-mask <i>mask</i>	(Optional) Specifies a mask for the increment range. This is an IP address expressed range in IPv4 format. This mask is used with the group address to generate subsequent group addresses: IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> . Note This mask is used with the group address to generate subsequent group addresses.
count <i>cnt</i>	(Optional) Specifies a number of group addresses to generate using the increment mask. Range is 1 to 512.
<i>source address</i>	(Optional) Source address of the multicast group to include in IPv4 prefixing format: IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .

Command Default

A router is not a statically connected member of an IP multicast group.

Command Modes

IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you configure the **static-group** command, packets to the group are switched out the interface, provided that packets were received on the correct Reverse Path Forwarding (RPF) interface.

The **static-group** command differs from the **join-group** command. The **join-group** command allows the router to join the multicast group and draw traffic to an IP client process (that is, the route processor). If you configure both the **join-group** and **static-group** command for the same group address, the **join-group** command takes precedence and the group behaves like a locally joined group.

**Note**

The **static-group** command has no impact on system performance. Configuring a static-group on a loopback interface has no effect on the ASR 9000 Series Aggregation Services Router.

Task ID

Task ID	Operations
multicast	read, write

Examples

In the following example, the router statically joins two multicast groups 225.2.2.2 and 225.2.2.4 for the specific source 1.1.1.1:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-igmp-default-if)# static-group 225.2.2.2 inc-mask 0.0.0.2 count
2 1.1.1.1
```

version

To configure an Internet Group Management Protocol (IGMP) version for the router, use the **version** command in the appropriate configuration mode. To restore the default value, use the **no** form of this command.

version {1| 2| 3}

no version

Syntax Description

1	Specifies IGMP Version 1.
2	Specifies IGMP Version 2.
3	Specifies IGMP Version 3.

Command Default

If this command is not specified in interface configuration mode, the interface adopts the IGMP version parameter specified in IGMP VRF configuration mode.

If this command is not specified in IGMP configuration mode, IGMP uses Version 3 .

Command Modes

IGMP configuration
IGMP VRF configuration
IGMP interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All routers on the subnet must be configured with the same version of IGMP. For example, a router running Cisco IOS XR software does not automatically detect Version 1 systems and switch to Version 1. Hosts can have any IGMP version and the router will correctly detect their presence and query them appropriately.

The **query-max-response-time** and **query-timeout** commands require IGMP Version 2 or 3.

**Note**

If you configure this command in IGMP configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces from interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router to use IGMP Version 3:

```
RP/0/RSP0/CPU0:router(config)# router igmp  
RP/0/RSP0/CPU0:router(config-igmp)# version 3
```

Related Commands

Command	Description
query-max-response-time, on page 26	Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) queries.
query-timeout, on page 28	Configures the timeout value before the router takes over as the querier for the interface.

vrf (igmp)

To configure a virtual private network (VRF) instance, use the **vrf** command in IGMP routing configuration mode. To remove the VRF instance from the configuration file and restore the system to its default condition, use the **no** form of this command.

vrf *vrf-name*

no vrf *vrf-name*

Syntax Description

<i>vrf-name</i>	Name of the VRF instance.

Command Default

No default behavior or values.

Command Modes

IGMP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you use the **vrf** command from the IGMP routing configuration mode to configure a VRF instance, you enter the IGMP VRF configuration submode.

A VRF instance is a collection of VPN routing and forwarding tables maintained at the provider edge (PE) router.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a VRF instance in IGMP configuration submode and to enter VRF configuration submode:

```
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# vrf
vrf_1
RP/0/RSP0/CPU0:router(config-igmp-vrf_1)#
```



Multicast Source Discovery Protocol Commands on the Cisco ASR 9000 Series Router

This chapter describes the commands used to configure and monitor the Multicast Source Discovery Protocol (MSDP) on the Cisco ASR 9000 Series Router.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the *Implementing Multicast Routing on the Cisco ASR 9000 Series Router* configuration module in *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide*.

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cache-sa holdtime

To configure the cache source-active (SA) state hold-time period on a router, use the **cache-sa-holdtime** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

cache-sa-holdtime *holdtime-number*

no cache-sa-holdtime *holdtime-number*

Syntax Description

<i>holdtime-number</i>	Hold-time period (in seconds). Range is 150 to 3600.

Command Default

holdtime-number : 150 seconds

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **cache-sa-holdtime** command is used to increase the cache SA state hold time. Any cache entry that is created usually expires after 150 seconds. For troubleshooting purposes, you may need Multicast Source Discovery Protocol (MSDP) to keep SA cache entries for a longer period.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set the cache SA state hold-time period to 200 seconds:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router
msdp
RP/0/RSP0/CPU0:router(config-msdp)# cache-sa-holdtime
200
```

cache-sa holdtime

Related Commands

Command	Description
cache-sa-state , on page 63	Controls cache source-active (SA) state on a router.

cache-sa-state

To control cache source-active (SA) state on a router, use the **cache-sa-state** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

cache-sa-state {**list** *access-list-number* | **rp-list** *access-list-name*}

no cache-sa-state {**list** *access-list-number* | **rp-list** *access-list-name*}

Syntax Description

list <i>access-list-number</i>	Specifies an IP access list that defines which (S, G) pairs to cache.
rp-list <i>access-list-name</i>	Specifies an access list name for the originating rendezvous point (RP).

Command Default

The router creates SA state.

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When a new member joins a group immediately after an SA message arrives, latency may occur and an SA message may be missed. To overcome this problem, you can configure this command and the router will supply SA information (from cache memory) to the new member instead of requiring that the member wait until the next SA message is received.

The **cache-sa-state** command is required in every Multicast Source Discovery Protocol (MSDP) speaker, to cache SA messages received from peers.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the cache state for all sources in 10.0.0.0/16 sending to groups 224.2.0.0/16:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# MSDP
RP/0/RSP0/CPU0:router(config-msdp)# cache-sa-state list 100
RP/0/RSP0/CPU0:router(config-msdp)# exit
RP/0/RSP0/CPU0:router(config)# ipv4
access-list 100 permit 10.0.0.0 0.0.255.255 224.2.0.0 0.0.255.255
```

**Note**

The source and destination fields in the access list matches on the (S,G) fields in the SA messages. We recommend that the first address and mask field in the access list is used for the source and the second field in the access list is used for the group or destination.

Related Commands

Command	Description
show msdp sa-cache , on page 100	Displays the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers.

clear msdp peer

To clear the TCP connection of the specified Multicast Source Discovery Protocol (MSDP) peer, use the **clear msdp peer** command in EXEC mode.

clear msdp [**ipv4**] **peer** *peer-address*

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>peer-address</i>	IPv4 address or hostname of the MSDP peer to which the TCP connection is cleared.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear msdp peer** command closes the TCP connection to the MSDP peer, resets all the MSDP peer statistics, and clears the input and output queues to and from the MSDP peer.

Task ID

Task ID	Operations
multicast	execute

Examples

The following example shows how to clear the TCP connection of the MSDP peer at address 224.15.9.8:

```
RP/0/RSP0/CPU0:router# clear msdp peer 224.15.9.8
```

 clear msdp peer**Related Commands**

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.

clear msdp sa-cache

To clear external Multicast Source Discovery Protocol (MSDP) source-active (SA) cache entries, use the **clear msdp sa-cache** command in EXEC mode.

clear msdp [ipv4] sa-cache [*group-address*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>group-address</i>	(Optional) Multicast group address or name for which external SA entries are cleared from the SA cache.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

SA caching is enabled by default on Cisco IOS XR software.

If you do not specify a multicast group by group address or group name with the *group-address* argument, the **clear msdp sa-cache** command clears all external SA cache entries.



Note

Local SA cache entries can be cleared using the **clear pim topology** command.

Task ID

Task ID	Operations
multicast	execute

Examples

The following example shows how to clear the external SA entries for the multicast group at address 224.5.6.7 from the cache:

```
RP/0/RSP0/CPU0:router# clear msdp sa-cache 224.5.6.7
```

Related Commands

Command	Description
show msdp sa-cache , on page 100	Displays the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers.

clear msdp stats

To reset Multicast Source Discovery Protocol (MSDP) peer statistic counters, use the **clear msdp stats** command in EXEC mode.

clear msdp [**ipv4**] **stats** [**peer** *peer-address*] [**allvalues**]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
peer <i>peer-address</i>	(Optional) Clears MSDP peer statistic counters for the specified IPv6 MSDP peer address or peer name.
allvalues	(Optional) Clears all statistic counters for all MSDP peers.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear msdp stats** command resets MSDP peer statistic counters such as the number of keepalives sent and received and the number of Source Active (SA) entries sent and received.

If you do not specify an MSDP peer with the **peer** keyword and *peer-address* argument, this command clears statistic counters for all MSDP peers.

Task ID

Task ID	Operations
multicast	execute

Examples

The following example shows how to clear all statistics for all peers:

```
RP/0/RSP0/CPU0:router# clear msdp stats peer 224.0.1.1
```

clear msdp stats

Related Commands

Command	Description
show msdp statistics peer, on page 105	Displays Multicast Source Discovery Protocol (MSDP) peer statistic counters.

connect-source

To configure a source address used for a Multicast Source Discovery Protocol (MSDP) connection, use the **connect-source** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

connect-source *type* [*interface-path-id*]

no connect-source *type* [*interface-path-id*]

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

If a source address is not configured for the MSDP connection, the IP address of the interface toward the peer is used as a source address.

Command Modes

MSDP configuration
MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **connect-source** command:

- Specifies the interface type and path ID whose primary address becomes the source IP address for the TCP connection.
- Is recommended for MSDP peers that peer with a router inside the remote domain.
- Can be configured globally for MSDP (and is inheritable by MSDP peers). This global configuration can be overridden if the command is issued again in peer configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a loopback interface source address for an MSDP connection:

```
RP/0/RSP0/CPU0:router(config)# interface loopback 0  
RP/0/RSP0/CPU0:router(config-if)# ipv4 address 10.1.1.1/24  
RP/0/RSP0/CPU0:router(config-if)# exit  
RP/0/RSP0/CPU0:router(config)# router msdp  
RP/0/RSP0/CPU0:router(config-msdp)# connect-source loopback 0
```

default-peer

To define a default peer from which to accept all Multicast Source Discovery Protocol (MSDP) source-active (SA) messages, use the **default-peer** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

default-peer *ip-address*

no default-peer

Syntax Description

<i>ip-address</i>	IP address or Domain Name System (DNS) name of the MSDP default peer.

Command Default

No default MSDP peer exists.

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A default peer configuration accepts all MSDP Source-Active (SA) messages, as a last Reverse Path Forwarding (RPF) rule, when all other MSDP RPF rules fail.

Use the **default-peer** command if you do not want to configure your MSDP peer to be a BGP peer also.

When the **prefix-list list** keyword and argument are not specified, all SA messages received from the configured default peer are accepted.

Remember to configure a BGP prefix list to configure the **prefix-list list** keyword and argument with the **default-peer** command.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router 172.16.12.0 as the default peer to the local router:

```
RP/0/RSP0/CPU0:router(config)# router msdp  
RP/0/RSP0/CPU0:router(config-msdp)# default-peer 172.16.12.0
```

Related Commands

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.

description (peer)

To add descriptive text to the configuration for a Multicast Source Discovery Protocol (MSDP) peer, use the **description** command in peer configuration mode. To return to the default behavior, use the **no** form of this command.

description *peer-address text*

no description *peer-address text*

Syntax Description

<i>peer-address</i>	IP address or hostname for the peer to which this description applies.
<i>text</i>	Description of the MSDP peer. Use up to 80 characters to describe this peer.

Command Default

No description is associated with an MSDP peer.

Command Modes

MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configure a description to make the MSDP peer easier to identify. This description is visible in the **show msdp peer** command output.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router at the IP address 10.0.5.4 with a description indicating that it is a router at customer site A:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 10.0.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# description 10.0.5.4 router_at_customer_site_A
```

description (peer)

Related Commands

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.
show msdp peer, on page 95	Displays information about the Multicast Source Discovery Protocol (MSDP) peer.

maximum external-sa

To configure the maximum number of external Multicast Source Discovery Protocol (MSDP) source-active (SA) entries that can be learned by the router or by a specific MSDP peer, use the **maximum external-sa** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

maximum external-sa *entries*

no maximum external-sa

Syntax Description

<i>entries</i>	Maximum number of SA entries that can be learned by the router or a specific MSDP peer. Range is 1 to 75000.

Command Default

entries : 20000

Command Modes

MSDP peer configuration
MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When issued from MSDP configuration mode, the **maximum external-sa** command configures the total number of external SA entries (that is, the total cumulative SA state for all peers) that can be learned by the router. This command is used to control router resource utilization under heavy traffic conditions.



Note

The configuration fails if you configure the maximum number of external SA entries to be lower than the current accumulated SA state.

When issued from MSDP peer configuration mode, the **maximum external-sa** command configures the total number of external SA entries that can be learned by a specific MSDP peer. From MSDP configuration mode, this command can also be used to configure a specific MSDP peer to override the maximum external SA entry value configured with the **maximum peer-external-sa** command.

**Note**

The configuration fails if you configure the maximum number of external SA entries for a specific MSDP peer to be higher than the maximum number of external SA entries that can be learned by the router.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to configure the maximum number of external SA entries that can be learned by the router to 30000 SA entries:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# maximum external-sa 30000
```

This example shows how to configure the maximum number of external SA entries that can be learned by the MSDP peer at address 10.1.5.3 to 25000 SA entries:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 10.1.5.3
RP/0/RSP0/CPU0:router(config-msdp-peer)# maximum external-sa 25000
```

Related Commands

Command	Description
maximum peer-external-sa, on page 79	Configures the maximum number of external Multicast Source Discovery Protocol (MSDP) Source-Active (SA) entries that can be learned from MSDP peers.
show msdp summary, on page 107	Displays Multicast Source Discovery Protocol (MSDP) peer status.

maximum peer-external-sa

To configure the maximum number of external Multicast Source Discovery Protocol (MSDP) Source-Active (SA) entries that can be learned from MSDP peers, use the **maximum peer-external-sa** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

maximum peer-external-sa *entries*

no maximum peer-external-sa

Syntax Description

<i>entries</i>	Maximum number of SA entries to be learned by MSDP peers. Range is 1 to 75000.

Command Default

entries : 20000

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **maximum peer-external-sa** command configures the maximum number of external SA entries that can be learned for each configured MSDP peer, whereas the **maximum external-sa** command (in MSDP configuration mode) configures the maximum number of SA entries accepted by the router as a cumulative total.



Note

The configuration fails if you attempt to configure the maximum number of external SA entries for MSDP peers to be higher than the maximum number of external SA entries that can be learned by the router.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to configure the maximum number of external SA entries that each MSDP peer can learn to 27000 SA entries:

```
RP/0/RSP0/CPU0:router(config)# router msdp  
RP/0/RSP0/CPU0:router(config-msdp)# maximum peer-external-sa 27000
```

Related Commands

Command	Description
maximum external-sa, on page 77	Configures the maximum number of external Multicast Source Discovery Protocol (MSDP) source-active (SA) entries that can be learned by the router or by a specific MSDP peer.
show msdp summary, on page 107	Displays Multicast Source Discovery Protocol (MSDP) peer status.

mesh-group (peer)

To configure a Multicast Source Discovery Protocol (MSDP) peer to be a member of a mesh group, use the **mesh-group** command in peer configuration mode. To return to the default behavior, use the **no** form of this command.

mesh-group *name*

no mesh-group *name*

Syntax Description

<i>name</i>	Name of the mesh group.

Command Default

MSDP peers do not belong to a mesh group.

Command Modes

MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A *mesh group* is a group of MSDP speakers that have fully meshed MSDP connectivity among themselves. Any Source-Active (SA) messages received from a peer in a mesh group are not forwarded to other peers in the same mesh group.

Mesh groups can be used to:

- Reduce SA message flooding
- Simplify peer Reverse Path Forwarding (RPF) flooding (no need to run Border Gateway Protocol [BGP] among MSDP peers)

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MSDP peer at address 10.0.5.4 to be a member of the mesh group named internal:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router mdp
RP/0/RSP0/CPU0:router(config-mdp)# peer 10.0.5.4
RP/0/RSP0/CPU0:router(config-mdp-peer)# mesh-group internal
```

originator-id

To identify an interface type and instance to be used as the rendezvous point (RP) address in a Multicast Source Discovery Protocol (MSDP) Source-Active (SA) message, use the **originator-id** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

originator-id *type interface-path-id*

no originator-id *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

The RP address is used as the originator ID.

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **originator-id** command allows an MSDP speaker that originates an SA message to use the IP address of the interface as the RP address in the SA message.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure Gigabit Ethernet interface 0/1/1/0 to be used as the RP address in SA messages:

```
RP/0/RSP0/CPU0:router(config)# router msdp  
RP/0/RSP0/CPU0:router(config-msdp)# originator-id GigE0/1/1/0
```


password (peer)

To enable Message Digest 5 (MD5) authentication on a TCP connection between two Multicast Source Discovery Protocol (MSDP) peers, use the **password** command in MSDP peer configuration mode. To return to the default behavior, use the **no** form of this command.

password {**clear**|**encrypted**} *password*

no password {**clear**|**encrypted**} *password*

Syntax Description

clear	Specifies that an unencrypted password follows. The password must be a case-sensitive, clear-text unencrypted password.
encrypted	Specifies that an encrypted password follows. The password must be a case-sensitive, encrypted password.
<i>password</i>	Password of up to 80 characters. The password can contain any alphanumeric characters. However, if the first character is a number or the password contains a space, the password must be enclosed in double quotation marks; for example, "2 password."

Command Default

No password is configured.

Command Modes

MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **password** command supports MD5 signature protection on a TCP connection between two MSDP peers. When MD5 authentication is enabled between two MSDP peers, each segment sent on the TCP connection between the peers is verified. MD5 authentication must be configured with the same password on both MSDP peers; otherwise, the connection between them is not made. Configuring MD5 authentication causes the Cisco IOS XR software to generate and verify the MD5 digest of every segment sent on the TCP connection.

Use the **show msdp peer** command to check if a password has been configured on a peer.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MSDP password on a peer:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 10.0.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# password encrypted a34bi5m
```

Related Commands

Command	Description
show msdp peer, on page 95	Displays information about the Multicast Source Discovery Protocol (MSDP) peer.

peer (MSDP)

To configure a Multicast Source Discovery Protocol (MSDP) peer, use the **peer** command in MSDP configuration mode. To return to the default behavior, use the **no** form of this command.

peer *peer-address*

no peer *peer-address*

Syntax Description

<i>peer-address</i>	IP address or Domain Name System (DNS) name of the router that is to be the MSDP peer.

Command Default

No MSDP peer is configured.

Command Modes

MSDP configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configure the specified router as a Border Gateway Protocol (BGP) neighbor.

If you are also BGP peering with this MSDP peer, use the same IP address for MSDP as you do for BGP. However, you are not required to run BGP with the MSDP peer, as long as there is a BGP path between the MSDP peers. If there is no path, you must configure the **default-peer** command from MSDP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router at the IP address 172.16.1.2 as an MSDP peer to the local router and enter MSDP peer configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router msdp
```

```
RP/0/RSP0/CPU0:router(config-msdp)# peer 172.16.1.2  
RP/0/RSP0/CPU0:router(config-msdp-peer)#
```

Related Commands

Command	Description
default-peer , on page 73	Defines a default peer from which to accept all Multicast Source Discovery Protocol (MSDP) source-active (SA) messages.

remote-as (multicast)

To configure the remote autonomous system number of this peer, use the **remote-as** command in peer configuration mode. To return to the default behavior, use the **no** form of this command.

remote-as *as-number*

no remote-as *as-number*

Syntax Description

<i>as-number</i>	Autonomous system number of this peer. Range for 2-byte numbers is 1 to 65535. Range for 4-byte numbers is 1.0 to 65535.65535.

Command Default

If this command is not issued during peer configuration, the remote autonomous system value is derived from BGP (if also configured) or initialized to zero, when only Interior Gateway Protocol (IGP) is present.

Command Modes

MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **remote-as** command to configure remote autonomous system if deriving the autonomous system value from the configured Border Gateway Protocol (BGP) is not required.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set the autonomous system number for the specified peer to 250:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 172.16.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# remote-as 250
```

sa-filter

To configure an incoming or outgoing filter list for Source-Active (SA) messages received from the specified Multicast Source Discovery Protocol (MSDP) peer, use the **sa-filter** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

sa-filter {in|out} {list *access-list-name*|rp-list *access-list-name*}

no sa-filter {in|out} {list *access-list-name*|rp-list *access-list-name*}

Syntax Description

in out	Specifies incoming or outgoing SA filtering.
list <i>access-list-name</i>	Specifies an IP access list number or name. If no access list is specified, no (S, G) pairs from the peer are filtered.
rp-list <i>access-list-name</i>	Specifies an originating rendezvous point (RP) access list in SA messages.

Command Default

If the **sa-filter** command is not configured, no incoming or outgoing messages are filtered; all incoming SA messages are accepted from the peer, and all outgoing SA messages received are forwarded to the peer.

Command Modes

MSDP configuration
MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

You can configure the **sa-filter** command globally for MSDP (and is inheritable by MSDP peers); however, this global configuration can be overridden if it is issued again in peer configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

In the following example, only (S, G) pairs that pass access list 10 are forwarded in an SA message to the peer with IP address 131.107.5.4:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 131.107.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# sa-filter out list_10
```

In the following example, only (S, G) pairs for the rendezvous point that passes access list 151 are forwarded in an SA message to the peer with the IP address 131.107.5.4:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 131.107.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# sa-filter out rp-list list_151
```



Note

The source and destination fields in the access list matches on the (S,G) fields in the SA messages. We recommend that the first address and mask field in the access list is used for the source and the second field in the access list is used for the group or destination.

Related Commands

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.

show msdp globals

To display the Multicast Source Discovery Protocol (MSDP) global variables, use the **show msdp globals** command in EXEC mode.

show msdp [ipv4] globals

Syntax Description	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	Asplain format for 4-byte Autonomous system numbers notation was supported. The input parameters and output were modified to display 4-byte autonomous system numbers and extended communities in either asplain or asdot notations.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Some global variables associated with MSDP sessions are displayed, such as the originator ID, default peer, and connection state with Protocol Independent Multicast (PIM), Source.

Task ID	Task ID	Operations
	multicast	read

Examples The following is sample output from the **show msdp globals** command:

```
RP/0/RSP0/CPU0:router# show msdp globals

Multicast Source Discovery Protocol - msdp[405672]
AS: 10, caching, originator: not set, default peer: not set
Connected to PIM: yes
Active RP          Grange/len      Source Count
```



```

                                ADV/RPF      (Total, Active)
10.10.2.1                      224.0.0.0/4    0,0
10.10.10.3                     0.0.0.0      1,1

```

```

Max/active group count:      1/1
Max/active SA count:        1/1

```

```

General stats
Current lists allocated/free:      2/0
Total list items allocated/free:   9/1
Total source buffers allocated/free: 1/0
Total group buffers allocated/free: 1/0
Total RP buffers allocated/free:   2/0
TLV buffers allocated/free:        1/1

```

This table describes the significant fields shown in the display.

Table 6: show msdp globals Field Descriptions

Field	Description
AS	Local autonomous system.
caching	SA caching that is enabled.
originator	Local rendezvous point (RP).
default peer	Default peer to accept Source Active (SA) messages from when all Reverse Path Forwarding (RPF) rules fail.
Active RP	All RPs involved in sending SA messages to this router.
Grange/len	Multicast Group Range or Multicast Group Mask. The field is visible only when there is a specified group range for the local RP. If a group range is unspecified (for example, for RPs that advertise SAs) only the Advertiser address and the RPF information is displayed (see ADV/RPF below).
Source Count	Total and active SA messages advertised by the respective RP.
ADV/RPF	Advertiser and RPF entry.
Max/active group count	Maximum group count since router was booted and number of active groups.
Max/active SA count	Maximum SA message count since router was booted, and number of active SA messages.
Total source buffers allocated/free	Number of internal source buffers allocated and freed after allocation.

Field	Description
Total group buffers allocated/free	Number of internal group buffers allocated and freed after allocation.
Total RP buffers allocated/free	Number of internal RP buffers allocated and freed after allocation.
TLV buffers allocated/free	Number of internal time-to-live buffers allocated and freed after allocation.

Related Commands

Command	Description
show msdp peer, on page 95	Displays information about the Multicast Source Discovery Protocol (MSDP) peer.
show msdp sa-cache, on page 100	Displays the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers.

show msdp peer

To display information about the Multicast Source Discovery Protocol (MSDP) peer, use the **show msdp peer** command in EXEC mode.

show msdp [ipv4] peer [*peer-address*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>peer-address</i>	(Optional) IP address or hostname of the MSDP peer for which information is displayed.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Asplain format for 4-byte Autonomous system numbers notation was supported. The input parameters and output were modified to display 4-byte autonomous system numbers and extended communities in either asplain or asdot notations.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show msdp peer** command:

```
RP/0/RSP0/CPU0:router# show msdp peer 10.10.10.2
```

```
MSDP Peer 10.10.10.2 (?), AS 20
```

```
Description:
```

```
Connection status:
```

```
State: Up, Resets: 0, Connection Source: 10.10.10.12
```

```

Uptime(Downtime): 00:00:26, SA messages received: 0
TLV messages sent/received: 1/1
Output messages discarded: 0
Connection and counters cleared 00:00:26 ago
SA Filtering:
  Input (S,G) filter: none
  Input RP filter: none
  Output (S,G) filter: none
  Output RP filter: none
SA-Requests:
  Input filter: none
  Sending SA-Requests to peer: disabled
Password: None
Peer ttl threshold: 0
Input queue size: 0, Output queue size: 0

```

This table describes the significant fields shown in the display.

Table 7: show msdp peer Field Descriptions

Field	Description
MSDP Peer	IP address of the MSDP peer.
AS	Autonomous system to which the peer belongs.
State	State of the peer.
Uptime(Downtime)	Days and hours the peer is up or down, per state shown in previous column. If less than 24 hours, it is shown in terms of hours:minutes:seconds.
Msgs Sent/Received	Number of Source-Active (SA) messages sent to peer/number of SA messages received from peer.
Peer Name	Name of peer.
TCP connection source	Interface used to obtain IP address for TCP local connection address.
SA input filter	Name of the access list filtering SA input (if any).
SA output filter	Name of the access list filtering SA output (if any).
SA-Request filter	Name of the access list filtering SA request messages (if any).
Sending SA-Requests to peer	There are no peers configured to send SA request messages to.
Password	Information on the password. If the password is set on an active peer, "Configured, set on active socket" is displayed.

Field	Description
Peer ttl threshold	Multicast packets with an IP header that shows time-to-live greater than or equal to this value are sent to the MSDP peer.

Related Commands

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.
show msdp sa-cache, on page 100	Displays the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers.

show msdp rpf

To display the Multicast Source Discovery Protocol (MSDP) Reverse Path Forwarding (RPF) rule that governs whether an Source-Active (SA) from an originating RP will be accepted, use the **show msdp rpf** command in EXEC mode.

show msdp [ipv4] rpf *rpf-address*

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>rpf-address</i>	IP address or hostname of the RPF next hop.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show msdp rpf** command displays the peer interface and autonomous system to which the SAs are sent and forwarded based on the MSDP RPF rule. The rule is displayed and applied on the RP address field of the arriving SAs.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show msdp rpf** command for RP peer 10.1.1.1:

```
RP/0/RSP0/CPU0:router# show msdp rpf 10.1.1.1
```

```
RP peer for 172.16.1.1 is 10.1.1.1 AS 200, rule: 1
bgp/rib lookup: nexthop: 10.1.1.1, asnum: 200
```

This table describes the significant fields shown in the display.

Table 8: show msdp rpf Field Descriptions

Field	Description
RP peer for 172.16.1.1 is 10.1.1.1	IP address of the MSDP RPF peer.
AS 200	Autonomous system to which the peer belongs.
rule: 1	MSDP RPF rule that matches what was learned from SAs.
bgp/rib lookup:	Multicast RPF routing table lookup.
nexthop: 10.1.1.1	Router where the SA is sent to reach the final destination.
asnum: 200	Autonomous system number for the next-hop neighbor router.

show msdp sa-cache

To display the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers, use the **show msdp sa-cache** command in EXEC mode.

show msdp [ipv4] sa-cache [*source-address*] [*group-address*] [**all**] [**asnum** *as-number*] [**peer** *peer-address*] [**rpaddr** *rp-address*] [**summary**]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>source-address</i>	(Optional) Source address or hostname of the source about which (S, G) information is displayed.
<i>group-address</i>	(Optional) Group address or name of the group about which (S, G) information is displayed.
all	(Optional) Displays all Source Active (SA) entries with PI (PIM Interested) flags.
asnum <i>as-number</i>	(Optional) Displays SA entries of the specified autonomous system number. Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. Range for 4-byte Autonomous system numbers (ASNs) in asdot format is 1.0 to 65535.65535.
peer <i>peer-address</i>	(Optional) Displays peer entry information, including peer name and peer address.
rpaddr <i>rp-address</i>	(Optional) Displays SA entries that match the specified rendezvous point (RP) address.
summary	(Optional) Displays the count of all SA entries, RPs, sources, and groups.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Asplain format for 4-byte Autonomous system numbers notation was supported. The input parameters and output were modified to display 4-byte autonomous system numbers and extended communities in either asplain or asdot notations.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show msdp sa-cache** command is used to examine the (S, G) entries and the attributes, flags (L, E, EA), uptime, autonomous system number, and RP addresses that are stored in the SA cache.

These guidelines apply when this command is used:

- The **cache-sa-state** command is enabled by default.
- When you specify the **summary** keyword, the total number of cache, group, and source entries, and entries advertised by each RP and autonomous system are displayed.
- When you specify two addresses or names, an (S, G) entry corresponding to those addresses is displayed.
- When you specify a single group address, all sources for that group are displayed.
- When you specify no options, the entire SA cache is displayed, excluding the PI flag entries.

Task ID

Task ID	Operations
multicast	read

Examples

This is a sample output from the **show msdp sa-cache** command:

```
RP/0/RSP0/CPU0:router# show msdp sa-cache
```

MSDP Flags:

E - set MRIB E flag, L - domain local source is active,
EA - externally active source, PI - PIM is interested in the group,
DE - SAs have been denied.

Cache Entry:

(10.10.5.102, 239.1.1.1), RP 10.10.4.3, AS 20, 15:44:03/00:01:17

Learned from peer 10.10.2.2, RPF peer 10.10.2.2

SA's recvd 1049, Encapsulated data received: 0

grp flags: PI, src flags: E, EA, PI

This table describes the significant fields shown in the display.

Table 9: show msdp sa-cache Field Descriptions

Field	Description
(10.10.5.102, 239.1.1.1)	The first address (source) is sending to the second address (group).
RP 10.10.4.3	Rendezvous point (RP) address in the originating domain where the SA messages started.

Field	Description
MBGP/AS 20	RP is in autonomous system AS 20 according to the unicast RPF table: • If Multiprotocol Border Gateway Protocol (MBGP) is not configured—RIB table 1. • If MBGP is configured—RIB table 2 or multicast table.
15:44:03/00:01:17	The route has been cached for 15 hours, 44 minutes, and 3 seconds. If no SA message is received in 1 minute and 17 seconds, the route is removed from the SA cache.
Encapsulated data received: 0	MSDP SA captures any data information when the source starts so that the receiver does not miss data when the SA path is established.

The following is sample output using the **all** keyword option:

```
RP/0/RSP0/CPU0:router# show msdp sa-cache all
```

```
MSDP Flags:
E - set MRIB E flag , L - domain local source is active,
EA - externally active source, PI - PIM is interested in the group,
DE - SAs have been denied. Timers age/expiration,
Cache Entry:

(*, 239.1.1.1), RP 0.0.0.0, AS 0, 06:32:18/expired
Learned from peer local, RPF peer local
SAs recvd 0, Encapsulated data received: 0 grp flags: PI, src flags:
This table describes the significant fields shown in the display.
```

Table 10: show msdp sa-cache all Field Descriptions

Field	Description
(*, 239.1.1.1)	Protocol Independent Multicast (PIM) interest in the group due to a local Internet Group Management Protocol (IGMP) join.
RP 0.0.0.0	There is no RP associated with this entry.
AS 0	This entry is 0, autonomous system (AS) rendezvous point (RP) is null.
06:32:18/expired	Route is alive in hours, minutes, and seconds. Note that MSDP does not monitor this route as it is received from the MRIB and PIM.

The following is sample output using the **summary** keyword option:

```
RP/0/RSP0/CPU0:router# show msdp sa-cache summary
```

```
Total # of SAs = 3
Total # of RPs = 2
Total # of Sources = 1
Total # of Groups = 3

Originator-RP    SA total    RPF peer
172.16.1.1       0           0.0.0.0
172.17.1.1       3           172.17.1.1

AS-num    SA total
200       3
```

This table describes the significant fields shown in the display.

Table 11: show msdp sa-cache summary Field Descriptions

Field	Description
Total # of SAs	Total number of SAs that are currently active in the system.
Total # of RPs	Total number of RPs that have distributed the SA information to this system.
Total # of Sources	Total number of sources that are active from all domains.
Total # of Groups	Total number of groups to which sources are sending data from all domains.
Originator-RP	SA information based on the individual RPs and the originating domains that distributed them.
AS-num	SA information based on the originating autonomous system.

The following is sample output using the **asnum** keyword option:

```
RP/0/RSP0/CPU0:router# show msdp sa-cache asnum 200
```

```
MSDP Flags:
E - set MRIB E flag , L - domain local source is active,
EA - externally active source, PI - PIM is interested in the group,
DE - SAs have been denied. Timers age/expiration,
Cache Entry:

(172.31.1.1, 239.1.1.1), RP 5.1.1.1, AS 200, 00:00:25/00:02:04
  Learned from peer 5.1.1.1, RPF peer 172.17.1.1
  SAs recvd 1, Encapsulated data received: 100
  grp flags: none, src flags: EA
(172.31.1.1, 239.1.1.2), RP 172.17.1.1, AS 200, 00:00:16/00:02:13
  Learned from peer 172.17.1.1, RPF peer 172.17.1.1
  SAs recvd 1, Encapsulated data received: 100
  grp flags: none, src flags: EA
```

 show mshp sa-cache

```
(172.31.1.1, 239.1.1.3), RP 172.17.1.1, AS 200, 00:00:13/00:02:16
  Learned from peer 172.17.1.1, RPF peer 172.17.1.1
    SAs recvd 1, Encapsulated data received: 100
      grp flags: none, src flags: EA
```

Related Commands

Command	Description
cache-sa-state , on page 63	Controls cache source-active (SA) state on a router.
peer (MSDP) , on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.

show msdp statistics peer

To display Multicast Source Discovery Protocol (MSDP) peer statistic counters, use the **show msdp statistics peer** command in EXEC mode.

show msdp [ipv4] statistics peer [*peer-address*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>peer-address</i>	(Optional) IP address or name of the MSDP peer.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show msdp statistics peer** command displays MSDP peer statistics such as the number of keepalive messages sent and received and the number of Source-Active (SA) entries sent and received.

If you do not specify an MSDP peer with the *peer-address* argument, this command displays statistics for all MSDP peers.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show msdp statistics peer** command:

```
RP/0/RSP0/CPU0:router# show msdp statistics peer
MSDP Peer Statistics :-
Peer 10.1.2.3 : AS is 10, State is Up, 0 active SAs
                TLV Rcvd : 57 total
```

show msdp statistics peer

```

57 keepalives, 0 notifications
0 SAs, 0 SA Requests
0 SA responses, 0 unknowns
TLV Sent : 57 total
54 keepalives, 0 notifications
3 SAs, 0 SA Requests
0 SA responses
SA msgs : 0 received, 3 sent
Peer 10.2.3.4 : AS is 0, State is Connect, 0 active SAs
TLV Rcvd : 0 total
0 keepalives, 0 notifications
0 SAs, 0 SA Requests
0 SA responses, 0 unknowns
TLV Sent : 0 total
0 keepalives, 0 notifications
0 SAs, 0 SA Requests
0 SA responses
SA msgs : 0 received, 0 sent

```

This table describes the significant fields shown in the display.

Table 12: show msdp statistic peer Field Descriptions

Field	Description
Peer 10.1.2.3	All statistics are displayed for MSDP peer.
AS 10	Peer belongs to autonomous system (AS) 10.
State is UP	Peer state is established.
0 active SAs	There are no active SAs from this peer.
TLV Rcvd	Information about the time-to-lives (TLVs) received from this peer.
TLV Sent	Information about the TLVS sent to this peer.
SA msgs	Information about the SA messages for this peer.

Related Commands

Command	Description
clear msdp stats , on page 69	Resets Multicast Source Discovery Protocol (MSDP) peer statistic counters.

show msdp summary

To display Multicast Source Discovery Protocol (MSDP) peer status, use the **show msdp summary** command in EXEC mode.

show msdp [ipv4] summary

Syntax Description	ipv4 (Optional) Specifies IPv4 address prefixes.

Command Default	IPv4 addressing is the default.

Command Modes	EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show msdp summary** command displays peer status such as the following:

- Peer address
- Peer autonomous system
- Peer state
- Uptime and downtime
- Number of Source-Active (SA) messages sent or received

Task ID	Task ID	Operations
	multicast	read

Examples

The following is sample output from the **show msdp summary** command:

```
RP/0/RSP0/CPU0:router# show msdp summary
```

show msdp summary

```

Out of Resource Handling Enabled
Maximum External SA's Global : 20000
Current External Active SAs : 0

```

MSDP Peer Status Summary

Peer Address	AS	State	Uptime/ Downtime	Reset Count	Peer Name	Active SA Cnt	Cfg.Max Ext.SAs	TLV recv/sent
10.1.1.1	0	NoIntf	00:10:07	0	?	0	0	0/0

This table describes the significant fields shown in the display.

Table 13: show msdp summary Field Descriptions

Field	Description
Peer Address	Neighbor router address from which this router has MSDP peering established.
AS	Autonomous system to which this peer belongs.
State	State of peering, such as UP, inactive, connect, and NoIntf.
Uptime/Downtime	MSDP peering uptime and downtime in hours, minutes, and seconds.
Reset Count	Number of times the MSDP peer has reset.
Peer Name	DNS name of peer (if available).
Active SA Cnt	Total number of SAs that are active on this router.
Cfg. Max Ext. SAs	Total number of maximum external SAs after the SAs are dropped. If 0, nothing is configured.
TLV recv/sent	Total number of time-to-lives (TLVs) sent and received.

Related Commands

Command	Description
show msdp peer, on page 95	Displays information about the Multicast Source Discovery Protocol (MSDP) peer.
show msdp sa-cache, on page 100	Displays the (S, G) state learned from Multicast Source Discovery Protocol (MSDP) peers.

shutdown (MSDP)

To shut down a Multicast Source Discovery Protocol (MSDP) peer, use the **shutdown** command in peer configuration mode. To return to the default behavior, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes MSDP peer configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **shutdown** command to shut down the peer. To configure many MSDP commands for the same peer, shut down the peer, configure it, and activate the peer later.

You might also want to shut down an MSDP session without losing configuration information for the peer.

When a peer is shut down, the TCP connection is terminated and is not restarted.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to shut down the peer with the address 172.16.5.4:

```
RP/0/RSP0/CPU0:router(config)# router msdp
RP/0/RSP0/CPU0:router(config-msdp)# peer 172.16.5.4
RP/0/RSP0/CPU0:router(config-msdp-peer)# shutdown
```

 shutdown (MSDP)**Related Commands**

Command	Description
show msdp peer , on page 95	Displays information about the Multicast Source Discovery Protocol (MSDP) peer.

ttl-threshold (MSDP)

To limit which multicast data packets are sent in Source-Active (SA) messages to a Multicast Source Discovery Protocol (MSDP) peer, use the **ttl-threshold** command in MSDP configuration mode or peer configuration mode. To return to the default behavior, use the **no** form of this command.

ttl-threshold *ttl*

no ttl-threshold *ttl*

Syntax Description

<i>ttl</i>	Time to live value. Range is 1 to 255.

Command Default

ttl : 1

Command Modes

MSDP configuration
MSDP peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **ttl-threshold** command limits which multicast data packets are sent in data-encapsulated Source-Active (SA) messages. Only multicast packets with an IP header time-to-live (TTL) greater than or equal to the *ttl* argument are sent to the MSDP peer specified by the IP address or name.

Use the **ttl-threshold** command to use TTL to examine your multicast data traffic. For example, you can limit internal traffic to a TTL of 8. If you want other groups to go to external locations, send the packets with a TTL greater than 8.



Note

This command can be configured globally for MSDP (and to be inheritable by MSDP peers). However this global configuration can be overridden if issued again in peer configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a TTL threshold of eight hops:

```
RP/0/RSP0/CPU0:router(config)# router msdp  
RP/0/RSP0/CPU0:router(config-msdp)# ttl-threshold 8
```

Related Commands

Command	Description
peer (MSDP), on page 87	Configures a Multicast Source Discovery Protocol (MSDP) peer.



Multicast Routing and Forwarding Commands on Cisco ASR 9000 Series Router

This module describes the commands used to configure and monitor multicast routing on *the Cisco ASR 9000 Series Router*.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the *Implementing Multicast Routing on Cisco IOS XR Software* configuration module in the *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide*.

- [accounting per-prefix, page 116](#)
- [accounting per-prefix forward-only, page 118](#)
- [address-family \(multicast\), page 120](#)
- [address-family ipv4 mvpn \(bgp\), page 123](#)
- [bgp auto-discovery mldp inter-as, page 126](#)
- [boundary, page 127](#)
- [clear mfib counter, page 128](#)
- [clear mfib database, page 130](#)
- [clear mfib hardware adjacency-counters, page 131](#)
- [clear mfib hardware resource-counters, page 133](#)
- [clear mfib hardware route statistics, page 135](#)
- [disable \(multicast\), page 137](#)
- [enable \(multicast\), page 139](#)
- [forwarding-latency, page 141](#)
- [interface \(multicast\), page 143](#)
- [interface all enable, page 145](#)
- [interface-inheritance disable, page 147](#)
- [log-traps, page 149](#)

- [maximum disable, page 150](#)
- [mdt data, page 151](#)
- [mdt default, page 153](#)
- [mdt mtu, page 155](#)
- [mdt source, page 157](#)
- [mhost default-interface, page 159](#)
- [multicast-routing, page 161](#)
- [multipath, page 163](#)
- [next-hop-self, page 165](#)
- [nsf \(multicast\) , page 166](#)
- [oom-handling, page 168](#)
- [rate-per-route, page 170](#)
- [recursive-fec, page 171](#)
- [retain route-target all, page 172](#)
- [route-policy, page 173](#)
- [show mfib connections, page 174](#)
- [show mfib counter, page 176](#)
- [show mfib encap-info , page 178](#)
- [show mfib hardware interface, page 180](#)
- [show mfib hardware ltrace, page 185](#)
- [show mfib hardware resource-counters, page 189](#)
- [show mfib hardware route accept-bitmap, page 192](#)
- [show mfib hardware route internal, page 194](#)
- [show mfib hardware route mofrr, page 199](#)
- [show mfib hardware route olist, page 205](#)
- [show mfib hardware route statistics, page 215](#)
- [show mfib hardware route summary, page 219](#)
- [show mfib hardware table, page 222](#)
- [show mfib interface, page 224](#)
- [show mfib nsf, page 227](#)
- [show mfib route, page 230](#)
- [show mfib table-info, page 236](#)
- [show mhost default-interface, page 239](#)

- [show mhost groups , page 241](#)
- [show mrib client, page 243](#)
- [show mrib mpls forwarding, page 246](#)
- [show mrib mpls route, page 248](#)
- [show mrib mpls traffic-eng fast-reroute, page 249](#)
- [show mrib nsf, page 251](#)
- [show mrib platform trace, page 253](#)
- [show mrib route, page 255](#)
- [show mrib route-collapse, page 257](#)
- [show mrib route outgoing-interface, page 259](#)
- [show mrib table-info, page 261](#)
- [show mrib tlc, page 263](#)
- [show mrib vrf vrf_name route, page 265](#)
- [static-rpf, page 266](#)
- [ttl-threshold \(multicast\), page 268](#)
- [vrf \(multicast\), page 270](#)

accounting per-prefix

To enable accounting for multicast routing, use the **accounting per-prefix** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

accounting per-prefix

no accounting per-prefix

Syntax Description This command has no keywords or arguments.

Command Default This feature is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **accounting per-prefix** command is used to enable per-prefix counters only in hardware. Cisco IOS XR Software counters are always present. When enabled, every existing and new (S, G) route is assigned forward, punt, and drop counters on the ingress route and forward and punt counters on the egress route. The (*, G) routes are assigned a single counter.

There are a limited number of counters on all nodes. When a command is enabled, counters are assigned to routes only if they are available.

To display packet statistics, use the **show mfib route** and the **show mfib hardware route statistics** commands. These commands display “N/A” for counters when no hardware statistics are available or when the **accounting per-prefix** command is disabled .

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to enable accounting for multicast routing:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# accounting per-prefix
```

Related Commands

Command	Description
show mfib hardware route statistics, on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

accounting per-prefix forward-only

To reduce hardware statistics resource allocations when enabling accounting, particularly for multicast VPN (MVPN), use the **accounting per-prefix forward-only** command under multicast routing configuration mode. To return to the default mode of [accounting per-prefix](#), on page 116, use the **no** form of this command.

accounting per-prefix forward-only

no accounting per-prefix forward-only

Syntax Description

This command has no keywords or arguments.

Command Default

If no counters were configured, there is no default.

If the accounting per-prefix counter was previously configured, it becomes the default.

If no accounting was configured for multicast routing, forwarding-only is the default mode and triggers a data MDT transition in the case of MVPN deployment.

Command Modes

Multicast routing configuration

Multicast routing address family IPv4 and IPv6 configuration

Multicast VRF configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

The **accounting per-prefix forward-only** command has only one *fwd-only* counter. In other words, there is no *punt* or *drop* counter allocated.

We recommended this command for configuration of multicast VPN routing or for any line card that has a route-intensive configuration. Each individual router can support up to 150,000 routes.



Note

To verify the number of statistics allocated or free on a line card, use the [show mfib hardware resource-counters](#), on page 189 command in EXEC mode.

There are a limited number of counters on all nodes. When accounting on a prefix is enabled, counters are assigned to routes only if they are available.

To display packet statistics, use the **show mfib route** and the **show mfib hardware route statistics** commands. These commands display “N/A” for counters when no hardware statistics are available or when neither the [accounting per-prefix, on page 116](#) command nor the **accounting per-prefix forward-only** command are enabled.

You may switch between **accounting-perprefix** and **accounting per-prefix forward-only** statistics for ipv4 or ipv6 multicast family. However, be aware that only one set of counters is supported on the (*,G) routes (with fwd/punt/drop on ingress and fwd/drop on egress) regardless of whether you enabled the **accounting-perprefix** or **accounting-perprefix fwd-only** command.

Although you can switch accounting modes, this involves freeing the hardware statistics and reallocating them, thereby resulting in a loss of any previously collected data. Therefore, it is preferable to decide which statistics mode you want to use at the start to avoid the resource cost entailed by resetting the statistics counter values with a change in mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable accounting per-prefix forward-only for MVPN routing:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# accounting per-prefix forward-only
```

Related Commands

Command	Description
accounting per-prefix, on page 116	Enables accounting for multicast routing.
clear mfib hardware resource-counters, on page 133	Clears global resource counters.

address-family (multicast)

To display available IP prefixes to enable multicast routing and forwarding on all router interfaces, use the **address-family** command in multicast-routing configuration mode or multicast VRF configuration submode. To disable use of an IP address prefix for routing, use the **no** form of this command.

address-family [*vrf vrf-name*] {**ipv4**|**ipv6**}

no address-family [*vrf vrf-name*] {**ipv4**|**ipv6**}

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	Specifies IPv4 address prefixes.
ipv6	Specifies IPv6 address prefixes.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.2.0	The ipv6 keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **address-family** command either from multicast routing configuration mode or from multicast VRF configuration submode to enter either the multicast IPv4 or IPv6 address family configuration submode, depending on which keyword was chosen. Use the **address-family** command with the [multicast-routing, on page 161](#) command to start the following multicast processes:

- Multicast Routing Information Base (MRIB)
- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)

- Multicast Listener Discovery Protocol (MLD)

Basic multicast services start automatically when the multicast PIE is installed, without any explicit configuration required. The following multicast services are started automatically:

- Multicast Routing Information Base (MRIB)
- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)

Other multicast services require explicit configuration before they start. For example, to start the Multicast Source Discovery Protocol (MSDP) process, you must enter the **router msdp** command and explicitly configure it.

To enable multicast routing and protocols on interfaces, you must explicitly enable the interfaces using the **interface** command in multicast routing configuration mode. This action can be performed on individual interfaces or by configuring a wildcard interface using the **alias** command.

To enable multicast routing on all interfaces, use the **interface all enable** command in multicast routing configuration mode. For any interface to be fully enabled for multicast routing, it must be enabled specifically (or configured through the **interface all enable** command for all interfaces) in multicast routing configuration mode, and it must not be disabled in the PIM and IGMP configuration modes.

**Note**

The **enable** and **disable** keywords available under the IGMP and PIM interface configuration modes have no effect unless the interface is enabled in multicast routing configuration mode—either by default or by explicit interface configuration.

To allow multicast forwarding functionality, while turning multicast routing functionality off, [interface-inheritance disable, on page 147](#) command on a per interface or **interface all enable** basis in PIM or IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to enter IPv4 and IPv6 multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)#

RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-default-ipv6)#
```

This example shows how to enter IPv4 and IPv6 VRF multicast routing configuration submode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv4)#
```

```
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv6)#
```

Related Commands

Command	Description
alias	Creates a command alias.
interface all enable, on page 145	Enables multicast routing and forwarding on all new and existing interfaces.
interface all disable	Disables PIM processing on all new and existing interfaces.
interface-inheritance disable, on page 147	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 143	Configures multicast interface properties.

address-family ipv4 mvpn (bgp)

To enable Border Gateway Protocol (BGP) on a specific IPV4 unicast destination address prefix, use the **address-family ipv4 mvpn** command in the BGP sub-configuration mode. To disable this feature, use the **no** form of this command.

address-family ipv4 mvpn [**additional-paths**| **advertise best-external**| **as-path-loopcheck out disable**| **bgp** {**client-to-client reflection cluster-id** *ip_address* **disable**| **dampening** {*time value*| **route-policy policy param_value**}| **label-delay time**}| **inter-as install**| **nexthop** {**resolution prefix-length minimum value**| **route-policy policy param_value**| **trigger-delay** {**critical value**| **non-critical value**}| **retain**| **route-target download**| **update limit** {**address-family limit**| **sub-group** {**ebgp limit**| **ibgp limit**} }

no address-family ipv4 mvpn [**additional-paths**| **advertise best-external**| **as-path-loopcheck out disable**| **bgp** {**client-to-client reflection cluster-id** *ip_address* **disable**| **dampening** {*time value*| **route-policy policy param_value**}| **label-delay time**}| **inter-as install**| **nexthop** {**resolution prefix-length minimum value**| **route-policy policy param_value**| **trigger-delay** {**critical value**| **non-critical value**}| **retain**| **route-target download**| **update limit** {**address-family limit**| **sub-group** {**ebgp limit**| **ibgp limit**} }

Syntax Description

additional-paths	Specifies the additional paths configuration.
advertise	Advertises the border gateway protocol path.
as-path-loopcheck	Configures AS path loop checking.
bgp	Configures the border gateway protocol commands.
inter-as	Controls the installation of the BGP MVPN routes into PIM/MLDP.
nexthop	Specifies the BGP nexthop location.
retain	Accepts or retains the specified BGP parameters.
route-target	Routes the target RIB installation.
update	Specifies the BGP update generation configuration.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Release	Modification
Release 4.2.0	The ipv6 keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **address-family** command either from multicast routing configuration mode or from multicast VRF configuration submode to enter either the multicast IPv4 or IPv6 address family configuration submode, depending on which keyword was chosen. Use the **address-family** command with the [multicast-routing, on page 161](#) command to start the following multicast processes:

- Multicast Routing Information Base (MRIB)
- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)
- Multicast Listener Discovery Protocol (MLD)

Basic multicast services start automatically when the multicast PIE is installed, without any explicit configuration required. The following multicast services are started automatically:

- Multicast Routing Information Base (MRIB)
- Multicast Forwarding Engine (MFWD)
- Protocol Independent Multicast Sparse mode (PIM-SM)
- Internet Group Management Protocol (IGMP)

Other multicast services require explicit configuration before they start. For example, to start the Multicast Source Discovery Protocol (MSDP) process, you must enter the **router msdp** command and explicitly configure it.

To enable multicast routing and protocols on interfaces, you must explicitly enable the interfaces using the **interface** command in multicast routing configuration mode. This action can be performed on individual interfaces or by configuring a wildcard interface using the **alias** command.

To enable multicast routing on all interfaces, use the **interface all enable** command in multicast routing configuration mode. For any interface to be fully enabled for multicast routing, it must be enabled specifically (or configured through the **interface all enable** command for all interfaces) in multicast routing configuration mode, and it must not be disabled in the PIM and IGMP configuration modes.



Note

The **enable** and **disable** keywords available under the IGMP and PIM interface configuration modes have no effect unless the interface is enabled in multicast routing configuration mode—either by default or by explicit interface configuration.

To allow multicast forwarding functionality, while turning multicast routing functionality off, [interface-inheritance disable, on page 147](#) command on a per interface or **interface all enable** basis in PIM or IGMP configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to enter IPv4 and IPv6 multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)#
```

```
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-default-ipv6)#
```

This example shows how to enter IPv4 and IPv6 VRF multicast routing configuration submode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv4)#
```

```
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv6)#
```

Related Commands

Command	Description
alias	Creates a command alias.
interface all enable, on page 145	Enables multicast routing and forwarding on all new and existing interfaces.
interface all disable	Disables PIM processing on all new and existing interfaces.
interface-inheritance disable, on page 147	Separates the disabling of multicast routing and forwarding.
interface (multicast), on page 143	Configures multicast interface properties.

bgp auto-discovery mldp inter-as

To enable the MLDP I-PMSI core tree support, use the **bgp auto-discovery mldp inter-as** command in the BGP MVPN address-family sub configuration mode.

bgp auto-discovery mldp inter-as

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes BGP MVPN address-family sub configuration mode

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read, write

Examples

```
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf1
RP/0/RSP0/CPU0:router(config-mcast-vrf1)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-vrf1-ipv4)# bgp auto-discovery mldp inter-as
```

boundary

To configure the multicast boundary on an interface for administratively scoped multicast addresses, use the **boundary** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

boundary *access-list*

no boundary *access-list*

Syntax Description

<i>access-list</i>	Access list specifying scoped multicast groups. The name cannot contain a space or quotation mark; it may contain numbers.

Command Default

A multicast boundary is not configured.

Command Modes

Multicast routing interface configuration

Multicast routing VRF interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **boundary** command is used to set up a boundary to keep multicast packets from being forwarded.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set up a boundary for all administratively scoped addresses:

```
RP/0/RSP0/CPU0:router# access-list 1 deny 239.0.0.0 0.255.255.255
RP/0/RSP0/CPU0:router# access-list 1 permit 224.0.0.0 15.255.255.255
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/2/0/2
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# boundary 1
```

clear mfib counter

To clear Multicast Forwarding Information Base (MFIB) route packet counters, use the **clear mfib counter** command in EXEC mode.

clear mfib [**vrf** *vrf-name*] **ipv4 counter** [*group-address* | *source-address*] [**location** {*node-id* | **all**}]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>group-address</i>	(Optional) IP address of the multicast group.
<i>source-address</i>	(Optional) IP address of the source of the multicast route.
location <i>node-id</i>	(Optional) Clears route packet counters from the designated node.
all	The all keyword clears route packet counters on all nodes

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

This command only clears MFIB route packet software counters. To clear MFIB hardware statistics counters use the **clear mfib hardware route statistics** command.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to clear MFIB route packet counters on all nodes:

```
RP/0/RSP0/CPU0:router# clear mfib counter location all
```

clear mfib database

To clear the Multicast Forwarding Information Base (MFIB) database, use the **clear mfib database** command in EXEC mode.

clear mfib ipv4 database [**location** {*node-id*} **all**]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Clears global resource counters from the designated node.
all	The all keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear the Multicast Forwarding Information Base (MFIB) database on all nodes:

```
RP/0/RSP0/CPU0:router# clear mfib database location all
```

clear mfib hardware adjacency-counters

To clear the platform-specific information related to resource counters for the Multicast Forwarding Information Base, use the **clear mfib hardware adjacency-counters** command in EXEC mode.

clear mfib [*vrf vrf-name*] [*ipv4*] **hardware adjacency-counters** [*rx*|*tx*] [*location {node-id|all}*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
rx	Clears adjacency counters for packets received.
tx	Clears adjacency counters for packets sent.
location <i>node-id</i>	(Optional) Clears adjacency counters from the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear all adjacency counters:

```
RP/0/RSP0/CPU0:router# clear mfib hardware adjacency-counters rx location all
```

 clear mfib hardware adjacency-counters**Related Commands**

Command	Description
show mfib hardware resource-counters , on page 189	Displays the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process.

clear mfib hardware resource-counters

To clear global resource counters, use the **clear mfib hardware resource-counters** command in EXEC mode.

clear mfib [*vrf vrf-name*] [*ipv4| ipv6*] **hardware resource-counters** [*location {node-id| all}*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Clears global resource counters from the designated node.
all	The all keyword clears all global resource counters.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear mfib hardware resource-counters** to estimate resource usage for an operation.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following example shows how to clear all global resource counters:

```
RP/0/RSP0/CPU0:router# clear mfib hardware resource-counters location all
```

 clear mfib hardware resource-counters**Related Commands**

Command	Description
show mfib hardware resource-counters , on page 189	Displays the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process.

clear mfib hardware route statistics

To reset all allocated counter values matching (S,G) or (*,G) criteria , use the **clear mfib hardware route statistics** command in EXEC mode.

```
clear mfib [vrf vrf-name] [ipv4] hardware route statistics ingress-and-egress [*] source-address
[group-address [/prefix-length]] [location {node-id} all]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ingress-and-egress	(Optional) Clears hardware statistics on both the incoming (ingress) and outgoing (egress) routes.
*	(Optional) Clears shared tree route statistics.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
location	(Optional) Clears route packet counters from the designated node.
<i>node-id</i>	The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
all	The all keyword clears route packet counters on all nodes

Command Default

If not specified, IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs.

The Multicast Forwarding (MFWD) process exists on each line card and assigns hardware counters to each (S, G) route. Additionally, one global counter is assigned for all (*, G) routes, depending on resource availability.

To clear the set of counters for (*, G) routes, the MFWD process assigns a single set of counters to count packets that match (*, G) routes. Consequently, the **clear mfib hardware route statistics** command must be used in a form that either clears counters on all routes or matches all (*, G) routes.

**Note**

This command only clears MFIB hardware statistics counters. To clear MFIB route packet software counters, use the **clear mfib counter** command.

Task ID

Task ID	Operations
multicast	read, write, execute

Examples

The following command shows how to clear counters by route statistics for all multicast routes on both ingress and egress forwarding engines for the line card 0/1/CPU0:

```
RP/0/RSP0/CPU0:router# clear mfib ipv4 hardware route statistics ingress-and-egress location 0/1/CPU0
```

Related Commands

Command	Description
show mfib hardware route statistics , on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.

disable (multicast)

To disable multicast routing and forwarding on an interface, use the **disable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

disable

no disable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding settings are inherited from the global **interface enable all** command. Otherwise, multicast routing and forwarding is disabled.

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **disable** command modifies the behavior of a specific interface to disabled. This command is useful if you want to disable multicast routing on specific interfaces, but leave it enabled on all remaining interfaces.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables the previously disabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
enable (multicast) , on page 139	Enables multicast routing and forwarding on an interface.
interface all enable , on page 145	Enables multicast routing and forwarding on all new and existing interfaces.

enable (multicast)

To enable multicast routing and forwarding on an interface, use the **enable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

enable

no enable

Syntax Description This command has no keywords or arguments.

Command Default Multicast routing and forwarding settings are inherited from the global **interface enable all** command. Otherwise, multicast routing and forwarding is disabled.

Command Modes Multicast routing interface configuration
Multicast routing VRF interface configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **enable** command modifies the behavior of a specific interface to enabled. This command is useful if you want to enable multicast routing on specific interfaces, but leave it disabled on all remaining interfaces.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables a previously enabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

enable (multicast)

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on a specific interface only:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# enable
```

Related Commands

Command	Description
disable (multicast) , on page 137	Disables multicast routing and forwarding on an interface.
interface all enable , on page 145	Enables multicast routing and forwarding on all new and existing interfaces.

forwarding-latency

To delay traffic being forwarded on a route, use the **forwarding-latency** command. To return to the default behavior, use the **no** form of this command.

forwarding-latency [*delay milliseconds*]

no forwarding-latency

Syntax Description	delay milliseconds (Optional) Specifies the delay time in milliseconds. Range is 5 - 500.

Command Default	The default delay time is 30 milliseconds.

Command Modes	Multicast routing configuration IPv4 and IPv6 multicast routing configuration

Command History	Release	Modification
	Release 3.8.0	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **forwarding-latency** command when you expect a receiver to leave and rejoin the same multicast group within a very short period such as 20 or 30 milliseconds. The delay may be required to provide the router sufficient time to update its Multicast Forwarding Information Base (MFIB) table.

When the **forwarding-latency** command is enabled, each interface is allocated a separate table lookup unit (TLU) block in the output interface list (olist), thereby increasing TLU hardware resource usage, and, for this reason, it should be used with caution when many multicast routes are present.

When the **forwarding-latency** command is disabled, up to three interfaces may share a single TLU block in the olist.

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to delay traffic from being forwarded for 120 milliseconds:

```
RP/0/RSP0/CPU0:router# configure  
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router# forwarding-latency delay 120
```

interface (multicast)

To configure multicast interface properties, use the **interface** command in the appropriate configuration mode. To disable multicast routing for interfaces, use the **no** form of this command.

interface *type interface-path-id*

no interface *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
IPv4 or multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to configure multicast routing properties for specific interfaces.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 137	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 139	Enables multicast routing and forwarding on an interface.
interface all enable, on page 145	Enables multicast routing and forwarding on all new and existing interfaces.

interface all enable

To enable multicast routing and forwarding on all new and existing interfaces, use the **interface all enable** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

interface all enable

no interface all enable

Syntax Description

This command has no keywords or arguments.

Command Default

Multicast routing and forwarding is disabled by default.

Command Modes

Multicast routing configuration

Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command modifies the default behavior for all new and existing interfaces to enabled unless overridden by the **enable** or **disable** keywords available in interface configuration mode.

The following guidelines apply when the **enable** and **disable** commands (and the **no** forms) are used in conjunction with the **interface all enable** command:

- If the **interface all enable** command is configured:
 - The **enable** and **no** forms of the command have no additional effect on a specific interface.
 - The **disable** command disables multicast routing on a specific interface.
 - The **no disable** command enables a previously disabled interface.
- If the **interface all enable** command is not configured:
 - The **enable** command enables multicast routing on a specific interface.
 - The **no enable** command enables a previously enabled interface.
 - The **disable** and **no** forms of the command have no additional effect on a specific interface.

 interface all enable
Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multicast routing on all interfaces and disable the feature only on GigabitEthernet interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# interface all enable
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# disable
```

Related Commands

Command	Description
disable (multicast), on page 137	Disables multicast routing and forwarding on an interface.
enable (multicast), on page 139	Enables multicast routing and forwarding on an interface.

interface-inheritance disable

To separate PIM and IGMP routing from multicast forwarding on all interfaces, use the **interface-inheritance disable** command under multicast routing address-family IPv4 submode. To restore the default functionality, use the **no** form of the command.

interface-inheritance disable

no interface-inheritance disable

Syntax Description

This command has no keywords or arguments.

Command Default

This feature is not enabled by default.

Command Modes

Multicast routing configuration

Address- family IPv4 configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use of the **interface-inheritance disable** command together with the **interface type interface-path-id** or **interface all enable** command under multicast routing address-family IPv4 submode separates PIM and IGMP routing functionality from multicast forwarding on specified interfaces. You can nonetheless enable multicast routing functionality explicitly under PIM or IGMP routing configuration mode for individual interfaces.



Note

Although you can explicitly configure multicast routing functionality on individual interfaces, you cannot explicitly disable the functionality. You can only disable the functionality on all interfaces.

Used from the address-family ipv4 configuration submode, it prevents IGMP and PIM from inheriting the multicast-routing interface configuration.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following configuration disables PIM and IGMP routing functionality on all the interfaces using the **interface-inheritance disable** command, but multicast forwarding is still enabled on all the interfaces in the example, based on use of the keywords **interface all enable**.

PIM is enabled on *Loopback 0* based on its explicit configuration (**interface Loopback0 enable**) under router pim configuration mode.

IGMP protocol is enabled on GigabitEthernet0/6/0/3, because it too has been configured explicitly under router igmp configuration mode (**interface GigabitEthernet0/6/0/3 router enable**):

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface-inheritance disable
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# interface loopback 1 enable
```

```
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# show run router pim
```

With the **interface-inheritance disable** command in use, IGMP and PIM configuration are enabled in the protocol configuration as follows:

```
router igmp
  interface loopback 0
    router enable
```

```
router pim
  interface loopback 0
    enable
```

```
router pim vrf default address-family ipv4
  interface Loopback0
    enable
```

```
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# show run router igmp
```

```
router igmp
  vrf default
    interface GigabitEthernet0/6/0/3
      router enable
```


log-traps

To enable logging of trap events, use the **log-traps** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

log-traps

no log-traps

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enable logging of trap events:

```
RP/0/RSP0/CPU0:router# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast) # log-traps
```

maximum disable

To disable maximum state limits, use the **maximum disable** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

maximum disable

no maximum disable

Syntax Description This command has no keywords or arguments.

Command Default Maximum state limits are enabled.

Command Modes

- Multicast routing configuration
- Multicast routing address family IPv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **maximum disable** command to override the default software limit on the number of multicast routes.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to disable maximum state limits:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# maximum disable
```

mdt data

To configure multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN), use the **mdt data** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt data *mdt-group-address/mask* [**threshold** *threshold-value*] [*acl-name*]

no mdt data *mdt-group-address/prefix-length* [**threshold** *threshold-value*] [*acl-name*]

Syntax Description

<i>mdt-group-address</i>	IP address of the MDT group.
<i>/ mask</i>	A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
threshold <i>threshold</i>	Specifies the traffic rate threshold to trigger data MDT. Range is 1 to 4294967295.
<i>acl-name</i>	Access list (ACL) for the customer's VRF groups allowed to perform data MDT.

Command Default

threshold : 1

Command Modes

Multicast routing configuration
 Multicast routing address family IPv4 and IPv6 configuration
 Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.7.0	Additional keyword information was added to the command. The bottom of the threshold value range was increased by 1.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When certain multicast streams exceed a configured bandwidth, the multicast data is moved to an MDT data group that is dynamically chosen from an available pool of multicast addresses. If the traffic bandwidth falls

below the threshold, the source is switched back to the default MDT. To avoid transitions between the MDTs, traffic only reverts to the default MDT if traffic below the data MDT threshold is at least one minute old.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the data MDT group:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt data 172.23.2.2/24 threshold 1200 acl_A
```

Related Commands

Command	Description
mdt default, on page 153	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 155	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 157	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt default

To configure the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT), use the **mdt default** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt default {*mdt-default-group-address*| **ipv4** *mdt-default-address*}

no mdt default {*mdt-default-group-address*| **ipv4** *mdt-default-address*}

Syntax Description

<i>mdt-default-group-address</i>	IP address of the MDT default group entered in <i>A.B.C.D.</i> format.
ipv4	Specifies IPv4-encapsulated MDT.
<i>mdt-default-address</i>	MDT IPv4 default address entered in <i>A.B.C.D.</i> format

Command Default

The MDT default group address must be unique.

Command Modes

Multicast routing configuration
Multicast routing address family IPv4 and IPv6 configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 3.7.0	Additional keyword information was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default MDT has a unique group address used to create MVPN multicast tunnel interfaces.

Although within the multicast VRF configuration submode, the MDT configuration uses either the **ipv4** or **ipv6** keyword to distinguish the appropriate multicast VPN, the MDT core tree is IPv4.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MDT default group address from multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt default
172.16.10.1
```

The following example shows how to configure the MDT default group address from multicast VRF configuration submode for an IPv6 address family:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf-name address-family ipv6
RP/0/RSP0/CPU0:router(config-mcast-vrf-name-ipv6)#mdt default 172.16.10.1
```

Related Commands

Command	Description
mdt data, on page 151	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt mtu, on page 155	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 157	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt mtu

To configure the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT), use the **mdt mtu** command in multicast VPN configuration mode. To remove this functionality, use the **no** form of this command.

mdt mtu *value*

no mdt mtu *value*

Syntax Description

<i>value</i>	Specifies the MTU value and ranges between 401 to 65535. The configured mdt mtu value includes 24 bytes of GRE encapsulation.

Command Default

The MDT tunnel default size is 1376.

Command Modes

Multicast VRF configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the MTU of the multicast distribution tree:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf_A
RP/0/RSP0/CPU0:router(config-mcast-vrf_A-ipv4)# mdt mtu 2345
```

Related Commands

Command	Description
mdt data, on page 151	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 153	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt source, on page 157	Configures the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address.

mdt source

To configure the interface used to set the multicast VPN (MVPN) data multicast distribution tree (MDT) source address, use the **mdt source** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

mdt source *type interface-path-id*

no mdt source *type interface-path-id*

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

Multicast routing configuration
Multicast routing address family IPv4 configuration
Multicast VRF configuration

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **mdt source** command to identify the root of the multicast distribution tree in the service provider network. This address is used to update all MVPN peers through multiprotocol BGP.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the interface used to set the MDT source address:

```
RP/0/RSP0/CPU0:router# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# mdt source POS 0/1/0/0
```

**Note**

Per VRF MDT Source is a new feature introduced in IOS XR Software Release 3.9.0 apart from the existing default MDT source. Each VRF can have its own MDT source interface co-existing with the default MDT source to achieve core diversity.

The following example shows how to configure a per VRF MDT source:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4)# mdt source loopback0
RP/0/RSP0/CPU0:router(config-mcast)# vrf foo
RP/0/RSP0/CPU0:router(config-mcast-foo)# address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast-foo-ipv4)# mdt source loopback1 !
```

Related Commands

Command	Description
mdt data, on page 151	Configures multicast data to be part of a multicast distribution tree (MDT) data group for multicast VPN (MVPN).
mdt default, on page 153	Configures the default group address of the multicast VPN (MVPN) multicast distribution tree (MDT).
mdt mtu, on page 155	Configures the maximum transmission unit (MTU) configuration of the multicast VPN (MVPN) multicast distribution tree (MDT).

mhost default-interface

To configure the default interface for IP multicast transmission and reception to and from the host stack, use the **mhost default-interface** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

mhost ipv4 default-interface *type interface-path-id*

no mhost ipv4 default-interface *type interface-path-id*

Syntax Description

ipv4	Specifies IPv4 address prefixes.
ipv6	Specifies IPv6 address prefixes.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

If no Multicast Host (MHost) default interface is configured, an arbitrary interface is selected as the active MHost default.

If multicast routing feature is enabled, a multicast-enabled interface is always selected as the MHost default interface.

Command Modes

Global configuration
Global VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **mhost default-interface** command configures the interface that the automatic route processing (Auto-RP), ping, and mtrace applications use for multicast transmissions, and the interface to which multicast groups are joined for reception.

The ping and mtrace features may use the MHost default interface to process multicast messaging. When IP multicast routing is enabled, packets sent to the MHost default interface are switched on other interfaces with a matching forwarding state. In addition, an arbitrary interface may be chosen to be the active MHost default interface if the configured interface is not operational. If no MHost default interface is configured with this command, an arbitrary interface is selected as the active MHost default.

**Note**

- The MHost default interface must be configured explicitly (preferably use a loopback interface).
- If the MHost default interface is not configured explicitly, then the router picks an interface.
- If the router picked multicast interface happens to be an ASBR link (on an ASBR router) and if that interface is configured with multicast boundary, then it may not work as intended because there is an IC (Internal Copy) flag on the interface and it has to accept all multicast packets on the interface.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure Loopback interface 1 as the default interface:

```
RP/0/RSP0/CPU0:router(config)# mhost ipv4 default-interface loopback 1
```

Related Commands

Command	Description
show mhost default-interface , on page 239	Displays the active default interface for the Multicast Host (MHost) process.

multicast-routing

To enter multicast routing configuration mode, use the **multicast-routing** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

multicast-routing

no multicast-routing

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values.

Command Modes Global configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Operations
multicast	read, write

Examples The following example shows how to enter multicast routing configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)#
```

Command	Description
accounting per-prefix, on page 116	Enables per-prefix counters only in hardware.
alias	Creates a command alias.
interface (multicast), on page 143	Configures multicast interface properties.

Command	Description
interface all enable , on page 145	Enables multicast routing and forwarding on all new and existing interfaces.

multipath

To enable Protocol Independent Multicast (PIM) to divide the multicast load among several equal cost paths, use the **multipath** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

[address-family ipv4] **multipath** [hash {source| source next-hop}]
no multipath

Syntax Description

hash	(Optional) Enables multipath hashing.
source	Enables source-based multipath hashing.
source-nexthop	(Optional) Enables source with next-hop hashing.
Note	This option is available only for IPv6 addressing.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration
 Multicast routing address-family ipv4
 Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, equal-cost multipath (ECMP) paths are not load balanced. A single path from each unicast route is used for all multicast routes (which is the equivalent of the **no** form of the multipath command).

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable multipath functionality:

```
RP/0/RSP0/CPU0:router(config)# mcast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# multipath hash
```


next-hop-self

To disable the next hop calculation for a neighbor, use the **next-hop-self** command in the BGP neighbor address-family configuration mode. To disable this feature, use the **no** form of this command.

next-hop-self [**inheritance-disable**]

Syntax Description	inheritance-disable	(Optional) Prevents next-hop-self from being inherited from the parent.

Command Default No default behavior or values

Command Modes BGP Neighbor Address-family Configuration mode

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read, write

Examples

```
RP/0/RSP0/CPU0:router(config-bgp-nbr)# address-family vpnv4 unicast
RP/0/RSP0/CPU0:router(config-bgp-nbr-af)# next-hop-self
```

nsf (multicast)

To turn on the nonstop forwarding (NSF) capability for the multicast routing system, use the **nsf** command in multicast routing configuration mode. To turn off this function, use the **no** form of this command.

nsf [*lifetime seconds*]

no nsf [*lifetime*]

Syntax Description

lifetime <i>seconds</i>	(Optional) Specifies the maximum time (in seconds) for NSF mode. Range is 30 to 3600.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration
Multicast routing address family ipv4 configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **nsf** command does not enable or disable the multicast routing system, but just the NSF capability for all the relevant components. When the **no** form of this command is used, the NSF configuration is returned to its default disabled state.

Enable multicast NSF when you require enhanced availability of multicast forwarding. When enabled, failures of the control-plane multicast routing components Multicast Routing Information Base (MRIB) or Protocol Independent Multicast (PIM) will not cause multicast forwarding to stop. When these components fail or communication with the control plane is otherwise disrupted, existing Multicast Forwarding Information Base (MFIB) entries continue to forward packets until either the control plane recovers or the MFIB NSF timeout expires.

Enable multicast NSF when you upgrade control-plane Cisco IOS XR Software packages so that the live upgrade process does not interrupt forwarding.

When the MFIB partner processes enter NSF mode, forwarding on stale (nonupdated) MFIB entries continues as the control-plane components attempt to recover gracefully. Successful NSF recovery is signaled to the Multicast Forwarding Engine (MFWD) partner processes by MRIB. MRIB remains in NSF mode until Internet Group Management Protocol (IGMP) has recovered state from the network and host stack *and* until PIM has recovered state from the network and IGMP. When both PIM and IGMP have recovered and fully updated

the MRIB, MRIB signals the MFIBs that NSF is ending, and begins updating the stale MFIB entries. When all updates have been sent, the MFWD partner processes delete all remaining stale MFIB entries and returns to normal operation, ending the NSF mode. MFIB NSF timeout prior to the signal from MRIB may cause NSF to end, and thus forwarding to stop.

When forwarding is in NSF mode, multicast flows may continue longer than necessary when network conditions change due to multicast routing protocols, unicast routing protocol reachability information, or local sender and receiver changes. The MFWD partner processes halt forwarding on stale MFIB entries when the potential for a multicast loop is detected by receipt of incoming data on a forwarding interface for the matching MFIB entry.

**Note**

For NSF to operate successfully in your multicast network, you must also enable NSF for the unicast protocols (such as Intermediate System-to-Intermediate System [IS-IS], Open Shortest Path First [OSPF] and Border Gateway Protocol [BGP]) that PIM relies on for Reverse Path Forwarding (RPF) information. See the appropriate configuration modules to learn how to configure NSF for unicast protocols.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable NSF for the multicast routing system:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# nsf
```

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf , on page 227	Displays the state of NSF operation for the MFIB line cards.
show mrib nsf , on page 251	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

oom-handling

To enable the out-of-memory (OOM) functionality on multicast routing software components, use the **oom-handling** command in multicast routing configuration mode. To remove this functionality, use the **no** form of this command.

oom-handling

no oom-handling

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled by default.

Command Modes

Multicast routing configuration

Multicast routing address family ipv4 configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the **oom-handling** command is enabled, and the router memory is low or in a warning state, the following states are not created:

- Protocol Independent Multicast (PIM) route states in response to PIM join and prune messages, and register messages
- Internet Group Management Protocol (IGMP) group states
- External Source-Active (SA) states in Multicast Source Discovery Protocol (MSDP)

Multicast routing **show** commands such as the **show pim topology** command indicate when the router is running low on memory and that new state creation has stopped.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable the out-of-memory functionality:

```
RP/0/RSP0/CPU0:router# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# oom-handling
```

Related Commands

Command	Description
show pim topology	Displays PIM topology table information.

rate-per-route

To enable individual (source, group [S, G]) rate calculations, use the **rate-per-route** command in the appropriate configuration mode. To remove this functionality, use the **no** form of this command.

rate-per-route

no rate-per-route

Syntax Description This command has no keywords or arguments.

Command Default This command is disabled by default.

Command Modes

- Multicast routing configuration
- Multicast routing address family ipv4 configuration
- Multicast VRF configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to enable individual route calculations:

```
RP/0/RSP0/CPU0:router# multicast-routing vrf vpn12 address-family ipv4
RP/0/RSP0/CPU0:router(config-mcast)# rate-per-route
```

Related Commands	Command	Description
	show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

recursive-fec

To enable the MLDP Recursive FEC support, use the **recursive-fec** command in the MPLS LDP MLDP sub configuration mode.

recursive-fec

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

MPLS LDP MLDP sub configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
multicast	read, write

Examples

```
RP/0/RSP0/CPU0:router(config)# mpls ldp
RP/0/RSP0/CPU0:router(config-ldp)# router-id 1.23.4.4
RP/0/RSP0/CPU0:router(config-ldp)# mldp
RP/0/RSP0/CPU0:router(config-ldp-mldp)# recursive-fec
```

retain route-target all

To accept or retain updates containing at least one route target for the specified bgp parameters, use the **retain route-target all** command in the BGP Address-family configuration mode. To disable this feature, use the **no** form of this command.

retain route-target all

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes BGP Address-family Configuration mode

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read, write

Examples

```
RP/0/RSP0/CPU0:router(config)# router bgp 100 RP/0/RSP0/CPU0:router(config-bgp)# bgp router-id 10.10.10.10
RP/0/RSP0/CPU0:router(config-bgp)# address-family ipv4 mvpn
RP/0/RSP0/CPU0:router(config-bgp-af)# retain route-target all
```


route-policy

To apply route policy to a neighbor, either to inbound routes or outbound routes, use the **route-policy** command in the BGP neighbor address-family configuration mode. To disable this feature, use the **no** form of this command.

route-policy *policy_name* [**in** | **out**]

Syntax Description

<i>policy-name</i>	Specifies the name of the route policy.
in	Applies route policy to inbound routes.
out	Applies route policy to outbound routes.

Command Default

No default behavior or values

Command Modes

BGP Neighbor Address-family Configuration mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
multicast	read, write

Examples

```
RP/0/RSP0/CPU0:router(config-bgp-nbr) # address-family vpnv4 unicast
RP/0/RSP0/CPU0:router(config-bgp-nbr-af) # route-policy pass-all in
RP/0/RSP0/CPU0:router(config-bgp-nbr-af) # route-policy pass-all out
```

show mfib connections

To display the status of Multicast Forwarding Information Base (MFIB) connections to servers, use the **show mfib connections** command in EXEC mode.

show mfib ipv4 connections [*location node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib connections** command to display a list of servers connected to the MFIB and the status of the connections.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib connections** command:

```
RP/0/RSP0/CPU0:router# show mfib connections
```

```
Netio          : connected
IM             : connected
Pakman         : connected
MRIB          : connected
IFH           : connected
SysDB-Global  : connected
```

```
SysDB-Local      : connected
SysDB-NSF        : connected
SYSDB-EDM        : connected
SYSDB-Action     : connected
AIB              : connected
MLIB             : connected
IDB              : connected
IIR              : connected
IPARM            : connected
GSP              : connected
```

Related Commands

Command	Description
show mfib interface, on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib counter

To display Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped, use the **show mfib counter** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 counter** [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB counter statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib counter** command displays packet drop statistics for packets that cannot be accounted for under route counters.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib counter** command:

```
RP/0/RSP0/CPU0:router# show mfib counter location 0/1/CPU0

MFIB global counters are :
* Packets [no input idb]      : 0
* Packets [failed route lookup] : 0
```

```
* Packets [Failed idb lookup] : 0
* Packets [Mcast disabled on input I/F] : 0
* Packets [encap drops due to ratelimit] : 0
* Packets [MC disabled on input I/F (iarm nfn)] : 0
```

This table describes the significant fields shown in the display.

Table 14: show mfib counter Field Descriptions

Field	Description
Packets [no input idb]	Packets dropped because no input interface information was found in the packet.
Packets [failed route lookup]	Packets dropped because of failure to match any multicast route.
Packets [Failed idb lookup]	Packets dropped because the descriptor block was not found for an interface (incoming or outgoing).
Packets [Mcast disabled on input I/F]	Packets dropped because arriving on an interface that was not enabled for the multicast routing feature.
Packets [encap drops due to ratelimit]	Packets dropped because of rate limit.

Related Commands

Command	Description
show mfib interface, on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib encap-info

To display the status of encapsulation information for Multicast Forwarding Information Base (MFIB), use the **show mfib encap-info** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 encap-info** [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib encap-info** command:

```
RP/0/RSP0/CPU0:router# show mfib vrf vrf_a encap-info
```

```
-----
Encaps String                               Dependent Encaps   MDT Name/
                               Routes #   Table ID   Handle
```

```
(192.168.5.203, 255.1.1.1)          5          0xe0000000  mdtA1 (0x100a480)
```

Related Commands

Command	Description
show mfib interface, on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware interface

To display hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware interface** command in EXEC mode.

show mfib [*vrf vrf-name*] [*ipv4*] **hardware interface** [*detail*] [*type interface-path-id*] [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
detail	(Optional) Displays detailed information about the MFIB interface.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib hardware interface** command displays multicast-specific information about the software switching interfaces of the router hardware. This command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware interface** command.

RP/0/RSP0/CPU0:router# **show mfib hardware interface location 0/0/CPU0**

LC Type: Trident

Interface	Handle	RefCnt	TTL	Routes	uIDB	Enbld	Comment
Gi0/0/0/4	0x180	5	0	2	5	True	success
Gi0/0/0/5	0x1c0	27	0	0	6	True	success
Gi0/0/0/6	0x200	5	0	2	7	True	success
Gi0/0/0/7	0x240	25	0	0	8	True	success
Gi0/0/0/8	0x280	30	0	2	9	True	success

ROUTE INFORMATION:

Legend:

S: Source, G: Group, P: Prefix length, PI: Packets cn, PO: packets out,
RF: RPF failures, TF: TTL failures, OF: OLIST failures, F: Other failures

Route flags - (Ingress)

C: Chip ID, IC: BACL check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID

Route flags - (Egress)

ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer

Interface: Gi0/0/0/4

S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
1	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
2	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	0	F	6	T	T	0	0x5518a
3	F	F	F	F	F	F	T	T	0x180	0x1	0x8006	1	T	6	T	T	3	0x555c2

S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
1	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
2	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
3	F	F	T	F	F	F	T	T	0x0	0x1	0x8004	1	T	5	T	T	3	0x555bd

Interface: Gi0/0/0/5

This interface is not part of the olist of any route

Interface: Gi0/0/0/6

S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS

show mfib hardware interface

```

0 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
1 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
2 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
3 F F F F F F T T 0x180 0x1 0x8006 1 T 6 T T 3 0x555c2
-----

```

```

S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0
-----

```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
1 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
2 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
3 F F T F F F T T 0x0 0x1 0x8004 1 T 5 T T 3 0x555bd
-----

```

```

Interface: Gi0/0/0/7

```

```

This interface is not part of the olist of any route

```

```

Interface: Gi0/0/0/8

```

```

S:4.0.0.2 G:227.0.0.1 P:32 PI:1 PO:0 RF:0 TF:0 OF:0 F:0
-----

```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
1 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
2 F F F F F F T T 0x180 0x1 0x8006 0 F 6 T T 0 0x5518a
3 F F F F F F T T 0x180 0x1 0x8006 1 T 6 T T 3 0x555c2
-----

```

```

S:0.0.0.0 G:227.0.0.1 P:32 PI:4 PO:0 RF:0 TF:0 OF:0 F:0
-----

```

```

C IC IP ID IS IU IF IM IV IR IA IG ET EO ER EM EV EC BS
-----
0 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
1 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
2 F F T F F F T T 0x0 0x1 0x8004 0 F 5 T T 0 0x55185
3 F F T F F F T T 0x0 0x1 0x8004 1 T 5 T T 3 0x555bd
-----

```

The following example shows a sample output for **show mfib hardware interface** command on the Cisco ASR 9000 Series SIP-700 line card:

```

RP/0/RSP0/CPU0:router# show mfib hardware interface serial 0/4/0/0/1 location 0/4/CPU0

```

```

LC Type: A9K-SIP-700

```

Hardware Interface Information

```

-----
Interface Handle Type TTL Number of Routes Multicast Enabled Num bundles
-----
Se0/4/0/0/1 0xc000ec0 0 0 2 True 0
-----

```

```

Header      : IDB Route Information
Source      : Source address
Group       : Group Address
M           : Mask Length
PI          : Packets in
PO          : Packets out
RF          : RPF failures
TF          : TTL failures
OF          : OLIST failures
F           : Other failures
C           : Directly connected check flag
RPF         : Accepting interface for non-bidir entries
S           : Signal if packet arrived on RPF interface
IC          : Aggregated Internal copy flag
PR          : Punt to RP flag for Internal copy in the Loopback interface
PK          : PEEK flag

```

```

FGID          : Fabric Group ID
MGID          : Multicast Group ID

Interface: Se0/4/0/0/1

Source: 12.12.12.2 Group: 225.0.0.0 M: 64 PI: 1 PO: 0 RF: 0 TF: 0 OF: 0 F: 0
C: F RPF: Se0/4/0/0/1 S: F IC: F PR: F PK: F FGID: 64 MGID: 17024

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900200

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80200

Route OCE Entry Information
-----

**** Leaf Info (in cp) : [9dcbccfc]
oce flags = 0x2 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0

Source: 0.0.0.0 Group: 225.0.0.0 M: 32 PI: 1 PO: 0 RF: 0 TF: 0 OF: 0 F: 0
C: T RPF: Se0/4/0/0/1 S: F IC: F PR: F PK: F FGID: 64 MGID: 17013

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900080

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80080

Route OCE Entry Information
-----

**** Leaf Info (in cp) : [9dcbd9bc]
oce flags = 0x6 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0
This table describes the significant fields shown in the display.

```

Table 15: show mfib hardware interface Field Descriptions

Field	Description
Interface	MFIB interface name.

show mfib hardware interface

Field	Description
Handle	A 32-bit system-wide identifier of the MFIB interface.
RefCnt	Number of times various data structures referred to this MFIB interface structure.
TTL	Multicast time-to-live threshold that was configured on this MFIB interface.
Routes	The number of routes that include this interface as a member.
uIDB	The ucode Interface Descriptor Block index.
Enbld	If true, multicast is enabled on the MFIB interface.
Comment	Indicates whether there were problems when reading hardware information.

Related Commands

Command	Description
show mfib interface , on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware ltrace

To display IP Multicast platform specific trace information for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware ltrace** command in EXEC mode.

show mfib [*vrf vrf-name*] [*ipv4*] **hardware ltrace** [*error*|*event*|*frequent-event*|*hexdump*|*init*|*last*|*netio*|*reverse*|*stats*|*tailf*|*unique*|*verbose*|*wrapping*] *file file-name* **location** *node-id*

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
error	(Optional) Displays error events.
event	(Optional) Displays non-frequent events.
frequent-event	(Optional) Displays frequent events.
hexdump	(Optional) Displays traces in hexadecimal output.
init	(Optional) Displays initiation and configuration events.
last	(Optional) Displays the last n entries.
netio	(Optional) Displays the netio events.
reverse	(Optional) Displays the traces in the reverse order starting with the latest events.
stats	(Optional) Displays the statistics.
tailf	(Optional) Displays the new traces as they are added.
unique	(Optional) Displays the unique entries with the counts.
verbose	(Optional) Displays the internal debugging information.
wrapping	(Optional) Displays the wrapping entries.
file <i>file-name</i>	(Optional) Specifies the file name.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Note**

This command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware ltrace** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware ltrace error location 0/1/cpu

3079 wrapping entries (4096 possible, 0 filtered, 4242 total)
May 21 01:45:32.865 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 01:45:32.877 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 01:58:37.019 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 01:58:37.019 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 02:15:38.620 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 02:15:38.620 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 02:26:06.440 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 02:26:06.440 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 03:11:18.805 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
May 21 03:11:18.805 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f2
May 21 03:36:31.240 ipmcast/error 0/1/CPU0 t1 Traffic Loss msg rxed, Null Route
, cntid=0x705f0
```

The following is a sample output for the **show mfib hardware ltrace** command on the Cisco ASR 9000 Series SIP-700 line card:

```
RP/0/RSP0/CPU0:router# show mfib hardware ltrace location 0/4/CPU0
```

```

438 wrapping entries (88064 possible, 0 filtered, 438 total)
Aug 25 00:22:02.978 mfwd_ipv4_hw/init 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/event 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/error 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:02.978 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ==>> Proc started jid=199, pid=163944
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization started
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully got shared memory window
header
Aug 25 00:22:03.001 mfwd_ipv4_hw/init 0/4/CPU0 t1 Platform extension does not exist - cold
boot
Aug 25 00:22:03.042 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC Gtrie Lib Init done: rc=0
Aug 25 00:22:03.075 mfwd_ipv4_hw/init 0/4/CPU0 t1 Library not initialized previously,
establishing connections
Aug 25 00:22:23.990 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC PAL Lib Init done: rc=0
Aug 25 00:22:24.851 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC iox Init done: rc=0
Aug 25 00:22:24.852 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully initiated thread ctx and
API ctx
Aug 25 00:22:24.871 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 00:22:24.898 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 00:22:24.902 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Rx Adjacency
APIs Lib
Aug 25 00:22:24.904 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 00:22:24.906 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 00:22:24.906 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized interface lib
Aug 25 00:22:24.979 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized EDM backend
Aug 25 00:22:24.999 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized utilities lib
Aug 25 00:22:25.000 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization
completed
Aug 25 00:22:26.046 mfwd_ipv4_hw/event 0/4/CPU0 t1 table: table id -536870912 vrf id
1610612736 got created/commit_table_ext 0x9dc89c10
Aug 25 00:22:26.098 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: Platform gtrie lib init started
Aug 25 00:22:26.099 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC gtrie init done prot=2 tab=0
rc=0
Aug 25 00:22:26.099 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: successfully initiated gtrie
0xa6039dec for protocol 0, table id 0, use shmem 1, shmem id 1
Aug 25 00:23:00.459 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Create adj cpp 1 adj handle 0xa73e907c
ifh 91 link 1 enctype 0 flags 1 hw addr 0x8c580000
Aug 25 00:24:25.780 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Create adj cpp 1 adj handle 0xa73e90c0
ifh 98 link 1 enctype 0 flags 1 hw addr 0x8c580010
Aug 25 21:43:52.966 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib terminate started,
terminate reason 2
Aug 25 21:43:52.982 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib terminate completed
Aug 25 21:43:55.783 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/error 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/event 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.783 mfwd_ipv4_hw/init 0/4/CPU0 t1 ==>> Proc started jid=199, pid=217192
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization started
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully got shared memory window
header
Aug 25 21:43:55.784 mfwd_ipv4_hw/init 0/4/CPU0 t1 Platform extension exists - warm boot
Aug 25 21:43:55.785 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC Gtrie Lib Init done: rc=0
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: Platform gtrie lib re-init started
for gtrie 0xa6039dec, shmem id 1
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC gtrie re init done prot=2 tab=0
rc=0
Aug 25 21:43:55.797 mfwd_ipv4_hw/init 0/4/CPU0 t1 gtrie: successfully re-initiated gtrie
0xa6039dec for protocol 0, table id 0, use shmem 1, shmem id 1
Aug 25 21:43:55.826 mfwd_ipv4_hw/init 0/4/CPU0 t1 Library not initialized previously,
establishing connections
Aug 25 21:43:56.241 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC PAL Lib Init done: rc=0
Aug 25 21:43:56.422 mfwd_ipv4_hw/init 0/4/CPU0 t1 CPP IPMC iox Init done: rc=0
Aug 25 21:43:56.423 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully initiated thread ctx and
API ctx
Aug 25 21:43:56.431 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server
Aug 25 21:43:56.442 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully done binding with CPP GIC
Server

```

```

Aug 25 21:43:56.444 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Rx Adjacency
APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Successfully binded with CPP Tx Adjacency
APIs Lib
Aug 25 21:43:56.445 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized interface lib
Aug 25 21:43:56.464 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized EDM backend
Aug 25 21:43:56.466 mfwd_ipv4_hw/init 0/4/CPU0 t1 Initialized utilities lib
Aug 25 21:43:56.471 mfwd_ipv4_hw/init 0/4/CPU0 t1 MFWD: Platform lib initialization
completed
Aug 25 21:43:58.412 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Modify adj cpp 1 adj handle 0xa73e907c
ifh 91 link 1 enctype 0 flags 1 hw addr 0x8c580000
Aug 25 21:43:58.412 mfwd_ipv4_hw/event 0/4/CPU0 t1 CPP Modify adj cpp 1 adj handle 0xa73e90c0
ifh 98 link 1 enctype 0 flags 1 hw addr 0x8c580010
Aug 26 22:25:50.253 mfwd_ipv4_hw/error 0/4/CPU0 t1 ==>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/netio 0/4/CPU0 t1 ==>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/fevent 0/4/CPU0 t1 ==>> Proc started jid=227, pid=163930
Aug 26 22:25:50.253 mfwd_ipv4_hw/event 0/4/CPU0 t1 ==>> Proc started jid=227, pid=163930

```


show mfib hardware resource-counters

To display the allocated and freed hardware resources for the Multicast Forwarding Information Base (MFIB) process, use the **show mfib hardware resource-counters** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 hardware resource-counters location** *node-id*

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware resource-counters** command to understand the table lookup unit (TLU) resource usage by MFIB.

- Usage for each channel
- Storing of specific data
- Allocation counts for metro statistics
- Failure counts for metro statistics



Note

Use the location option in the **show mfib hardware resource-counters** command to indicate for which linecard you need information. The command will not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mfib hardware resource-counters** command on the Cisco ASR 9000 Series SIP-700 line card:

```
RP/0/RSP0/CPU0:router# show mfib hardware resource-counters location 0/4/CPU0
```

```
LC Type: A9K-SIP-700
```

```
PD Memory Alloc/Free/In Use Stats:
```

Type	Allocated	Freed	In Use
global	0	0	0
table extension	1	0	1
route extension	18	11	7
interface extension	18	10	8
idb extension	3	0	3
EDM bag data	26	24	2
vpn extension	0	0	0
mdt ea extension	0	0	0

```
Ingress Hardware Resource Counters:
```

Type	Allocated	Freed	In Use
prefix stats resource	18	11	7
PLU prefix resource	18	11	7
prefix replica resource	0	0	0

```
Egress Hardware Resource Counters:
```

Type	Allocated	Freed	In Use
prefix stats resource	18	11	7
PLU prefix resource	18	11	7
prefix replica resource	21	12	9

```
Ingress Hardware Global Multicast Statistics:
```

Punt Packets:	3
Punt Drop Packets:	0
Inject Packets:	0
Inject Drop Packets:	0
Drop Packets/Bytes:	0/0

```
Egress Hardware Global Multicast Statistics:
```

Punt Packets:	0
Punt Drop Packets:	0
Inject Packets:	0
Inject Drop Packets:	0
Drop Packets/Bytes:	0/0

The following is a sample out put of **show mfib hardware resource-counters** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware resource-counters location 0/0/CPU0
```

```
LC Type: Trident
prm_stat success calls: ingress: 4250,4092      egress: 0,0
prm_stat failure calls: ingress: 0,0          egress: 0,0
```

Memory alloc stats

Type	Allocated	Freed	Delta
global	0	0	0
table extension	0	0	0
route extension	187	180	7
interface extension	221	215	6
idb extension	52	47	5
kmrs	159	159	0
kmrs key	652	652	0
kmrs result	488	488	0
uidb data	437	437	0
EDM bag data	5	3	2

This table describes the significant fields shown in the display.

Table 16: show mfib hardware resource counters Field Descriptions

Field	Description
prm_stat success calls	The number of successful calls to allocate and free statistics blocks, for ingress and egress statistics.
prm_stat failure calls	The number of failed calls to allocate and free statistics blocks, for ingress and egress statistics.
Type	Describes the structure type.
Allocated	The number of blocks allocated per structure type.
Freed	The number of blocks freed per structure type.
Delta	The difference between allocated and freed blocks per structure type.

Related Commands

Command	Description
clear mfib hardware adjacency-counters , on page 131	Clears the platform-specific information related to resource counters for the Multicast Forwarding Information Base.
show mfib interface , on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware route accept-bitmap

To display platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes, use the **show mfib hardware route accept-bitmap** command in EXEC mode.

show mfib [**vrf** *vrf-name*] **ipv4** **hardware route accept-bitmap** [*****] [*group-address* [/*prefix-length*]] [**detail**] [**location** *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
	(Optional) Displays shared tree entry.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
/ <i>prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Detailed list of the routing database.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Note**

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Related Commands

Command	Description
show mfib interface, on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.

show mfib hardware route internal

To display the route internal structures for the platform-specific Multicast Forwarding Information Base (MFIB) in the hardware, use the **show mfib hardware route internal** command in EXEC mode.

show mfib [**vrf** *vrf-name*] [**ipv4**] **hardware route internal** [*] [*source-address*] [*group-address* [/ *prefix-length*]] [**detail**] [**location** *node-id*]

Syntax Description

*	(Optional) Displays shared tree entries.
<i>A.B.C.D</i>	(Optional) Source IP address or hostname of the MFIB route.
<i>A.B.C.D/length</i>	(Optional) Group IP address or hostname of the MFIB route and the prefix length. Prefix length of the MFIB group address is a decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Details of each route (requires 140 columns).
location <i>node-id</i>	(Optional) Specifies the MFIB location.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of the **show mfib hardware route internal** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route internal detail location 0/1/CPU0
```

```
LC Type: Trident
```

```
-----
```

```
Legend:
```

```
Route Information - (Ingress)
```

```
NP: Network Processor, IC: BAcl check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID
```

```
Route Information - (Egress)
```

```
ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer
```

```
Route Information - (MDT)
```

```
TU: Tunnel Route, TE: Tunnel Encap, TD: Tunnel Decap,
CD: Conditional Decap, MI: MVET Index
```

```
MDT Encap Information
```

```
NP: Network Processor, UC: Use Customer ToS,
Csum: IP Checksum, TID: Table ID, UIDB: Tunnel UIDB,
T-ifh: Tunnel Interface Handle, StatP: Tunnel Stat Ptr,
CMG: Core Route Multicast Group ID, TMTU: Tunnel MTU
```

```
Software Route Information (PD)
```

```
T: Tunnel Route, E: Encap, D: Decap, CD: Conditional Decap,
MVET-ID: MDT Encap Table ID, MVD: MVET Entry Dirty,
TUS: Tunnel UIDB Set, TID: Table ID, UIDB: Tunnel UIDB
TMTU: Tunnel MTU
```

```
-----
```

```
Source: *                Group: 224.0.0.0        Mask length: 4    RPF Int: None
```

```
Route Information
```

```
-----
```

N	I	I	I	I	I	I	I	I	I	I	I	E	E	E	E	E	E	B	T	T	T
P	C	P	D	S	U	F	M	V	R	A	G	T	O	R	M	V	C	S	U	E	D
0	T	F	T	F	F	F	T	T	0x0	0x0	0x8080	0	F	3	T	T	0	0x3640f	F	F	F
1	T	F	T	F	F	F	T	T	0x0	0x0	0x8080	0	F	3	T	T	0	0x3640f	F	F	F
2	T	F	T	F	F	F	T	T	0x0	0x0	0x8080	0	F	3	T	T	0	0x3640f	F	F	F
3	T	F	T	F	F	F	T	T	0x0	0x0	0x8080	0	F	3	T	T	0	0x3640f	F	F	F

```
Software Route Information (PD)
```

T	E	D	CD	MVET-ID	MVD	TUS	TID	UIDB	T-ifh	TMTU
F	F	F	F	0x0	F	F	0x0	0x0	0x0	0

```
-----
```

```
Source: *                Group: 224.0.0.0        Mask length: 24    RPF Int: None
```

```
Route Information
```

```
-----
```

N	I	I	I	I	I	I	I	I	I	I	I	E	E	E	E	E	E	B	T	T	T
P	C	P	D	S	U	F	M	V	R	A	G	T	O	R	M	V	C	S	U	E	D
0	T	F	F	F	F	F	T	T	0x0	0x0	0x8084	0	F	0	T	T	0	0x36400	F	F	F
1	T	F	F	F	F	F	T	T	0x0	0x0	0x8084	0	F	0	T	T	0	0x36400	F	F	F
2	T	F	F	F	F	F	T	T	0x0	0x0	0x8084	0	F	0	T	T	0	0x36400	F	F	F
3	T	F	F	F	F	F	T	T	0x0	0x0	0x8084	0	F	0	T	T	0	0x36400	F	F	F

```
Software Route Information (PD)
```

T	E	D	CD	MVET-ID	MVD	TUS	TID	UIDB	T-ifh	TMTU
T	E	D	CD	MVET-ID	MVD	TUS	TID	UIDB	T-ifh	TMTU

show mfib hardware route internal

```

F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

Source: * Group: 224.0.1.39 Mask length: 32 RPF Int: None

Route Information

```

-----
N I I I I I I I I      I      I      E E E      E E E      B      T T T
P C P D S U F M V R      A      G      T O R      M V C      S      U E D
-----
0 F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
1 F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
2 F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F
3 F T F F F F T T 0x0      0x0      0x8085 0 F 1      T T 0      0x36405 F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

Source: * Group: 224.0.1.40 Mask length: 32 RPF Int: None

Route Information

```

-----
N I I I I I I I I      I      I      E E E      E E E      B      T T T
P C P D S U F M V R      A      G      T O R      M V C      S      U E D
-----
0 F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
1 F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
2 F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F
3 F T F F F F T T 0x0      0x0      0x8086 0 F 7      T T 0      0x36423 F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

Source: * Group: 232.0.0.0 Mask length: 8 RPF Int: None

Route Information

```

-----
N I I I I I I I I      I      I      E E E      E E E      B      T T T
P C P D S U F M V R      A      G      T O R      M V C      S      U E D
-----
0 T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
1 T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
2 T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F
3 T F F F F F T T 0x0      0x0      0x8087 0 F 2      T T 0      0x3640a F F F

```

Software Route Information (PD)

```

-----
T E D CD MVET-ID MVD TUS TID      UIDB      T-ifh      TMTU
-----
F F F F 0x0      F  F  0x0      0x0      0x0      0
-----

```

Source: * Group: 239.60.0.0 Mask length: 16 RPF Int: Gi0/1/

Route Information

```

-----
N I I I I I I I I      I      I      E E E      E E E      B      T T T
P C P D S U F M V R      A      G      T O R      M V C      S      U E D
-----
0 T F F F F F T T 0x2000500 0x0      0x8081 0 F 6      T T 0      0x3641e F F F
1 T F F F F F T T 0x2000500 0x0      0x8081 0 F 6      T T 0      0x3641e F F F

```


Cisco ASR 9000 Series Aggregation Services Router Multicast Command Reference, Release 4.2.x

show mfib hardware route mofrr

To display the platform-specific Multicast Forwarding Information Base (MFIB) information for the MoFRR (multicast only fast reroute)- enabled list stored in the hardware, use the **show mfib hardware route mofrr** command in EXEC mode.

show mfib hardware route mofrr {[*]] [*source-address*] [*group-address* [/ *prefix-length*]] [**detail**] } [**location** *node-id*]

Syntax Description

*	(Optional) Displays all the MoFRR routes configured in the platform.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
detail	(Optional) Displays a detailed list of the MoFRR routing database.
location <i>node-id</i>	Specifies the Node ID for an MFIB-designated node.

Command Default

IPv4 addressing is the default. Currently, MoFRR supports only IPv4 routes.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

MoFRR is a mechanism in which two copies of the same multicast stream flow through disjoint paths in the network. At the point in the network (usually the PE closer to the receivers) where the two streams merge, one of the streams is accepted and forwarded on the downstream links, while the other stream is discarded. When a failure is detected in the primary stream due to a link or node failure in the network, MoFRR instructs the forwarding plane to start accepting packets from the backup stream (which now becomes the primary stream).

MoFRR is triggered when the hardware detects traffic loss on the primary path of a given flow or route. Traffic loss is defined as no data packet having been received for 30 ms. When MoFRR is triggered, the primary and secondary reverse-path forwarding (RPF) interfaces are exposed to the forwarding plane and switchover occurs entirely at the hardware level.

The **show mfib hardware route mofrr** command displays the output MoFRR route list of the platform. If there is no MoFRR route enabled in the platform, then the output result is “There are no MoFRR routes configured”.

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mfib hardware route mofrr** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr location 0/0/cpu0

LC Type: Trident
-----
Legend:
Route MoFRR Information
A: Active RPF interface, MS: Monitoring State,
WDI: Watchdog Count Index, NP: Network Processor,
-----

Source: 20.20.20.1      Group: 225.0.0.1      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPFs      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8      T  2   1846768
Backup:    Gi0/0/0/18    F  0   1846769
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
              NP    Profile    Valid    Current-Cnt    Last-cnt
-----
Prim WDC    0         0         0           3848           12
Prim WDC    1         0         0           3848           12
Prim WDC    2         0         0           3848           12
Prim WDC    3         1         1           3848           12
Back WDC    0         0         0           3848           12
Back WDC    1         0         0           3848           12
Back WDC    2         0         0           3848           12
Back WDC    3         0         0           3848           12
-----

MoFRR Statistics:
-----
NP    Prim pkt rx    Back pkt rx    Interrupts    Punts
-----
0           0           0             0             0
1           0           0             0             0
2           0           0             0             0
3      406213       0             1             1
-----

Source: 20.20.20.1      Group: 225.0.0.2      Mask length: 64  RPF Int: Gi0/0/0/8
```

```

-----
RPFS      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8           T  2   1846770
Backup:    Gi0/0/0/18      F  0   1846771
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
              NP    Profile    Valid    Current-Cnt    Last-cnt
-----
Prim WDC      0         0         0           3848           12
Prim WDC      1         0         0           3848           12
Prim WDC      2         0         0           3848           12
Prim WDC      3         1         1           3848           12
Back WDC      0         0         0           3848           12
Back WDC      1         0         0           3848           12
Back WDC      2         0         0           3848           12
Back WDC      3         0         0           3848           12
-----

MoFRR Statistics:
-----
NP    Prim pkt rx    Back pkt rx    Interrupts    Punts
-----
0             0             0             0             0
1             0             0             0             0
2             0             0             0             0
3        406212         0             1             1
-----

```

The following is sample output from the show mfib hardware route MoFRR command with only one multicast group:

```

RP/0/RSP0/CPU0:router# show mfib hardware route mofrr 225.0.0.1 location 0/0/CPU0

LC Type: Trident
-----
Legend:
Route MoFRR Information
A: Active RPF interface, MS: Monitoring State,
WDI: Watchdog Count Index, NP: Network Processor,
-----

Source: 20.20.20.1      Group: 225.0.0.1      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPFS      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8           T  2   1846772
Backup:    Gi0/0/0/18      F  0   1846773
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----

```

```
show mfib hardware route mofrr
```

	NP	Profile	Valid	Current-Cnt	Last-cnt
Prim WDC	0	0	0	3848	12
Prim WDC	1	0	0	3848	12
Prim WDC	2	0	0	3848	12
Prim WDC	3	1	1	3848	12
Back WDC	0	0	0	3848	12
Back WDC	1	0	0	3848	12
Back WDC	2	0	0	3848	12
Back WDC	3	0	0	3848	12

MoFRR Statistics:

NP	Prim pkt rx	Back pkt rx	Interrupts	Punts
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	400465	0	1	1

The following is sample output from the show mfib hardware route MoFRR command with only one multicast source:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr 20.20.20.1 location 0/0/CPU0
```

LC Type: Trident

Legend:

Route MoFRR Information

A: Active RPF interface, MS: Monitoring State,
WDI: Watchdog Count Index, NP: Network Processor,

Source: 20.20.20.1 Group: 225.0.0.1 Mask length: 64 RPF Int: Gi0/0/0/8

RPFS	Interface	A	MS	WDI
Primary:	Gi0/0/0/8	T	2	1846772
Backup:	Gi0/0/0/18	F	0	1846773

OIFS

NP Intf

1 Gi0/0/0/28

Sequence num: 1 Num of switchovers: 0

WatchDog Counters:

	NP	Profile	Valid	Current-Cnt	Last-cnt
Prim WDC	0	0	0	3848	12
Prim WDC	1	0	0	3848	12
Prim WDC	2	0	0	3848	12
Prim WDC	3	1	1	3848	12
Back WDC	0	0	0	3848	12
Back WDC	1	0	0	3848	12
Back WDC	2	0	0	3848	12
Back WDC	3	0	0	3848	12

MoFRR Statistics:

NP	Prim pkt rx	Back pkt rx	Interrupts	Punts
0	0	0	0	0
1	0	0	0	0

```

2          0          0          0          0
3          0          0          1          1
-----
Source: 20.20.20.1      Group: 225.0.0.2      Mask length: 64  RPF Int: Gi0/0/0/8
-----
RPFs      Interface      A  MS  WDI
-----
Primary:   Gi0/0/0/8      T  2   1846774
Backup:    Gi0/0/0/18     F  0   1846775
-----

OIFS
-----
NP  Intf
-----
1   Gi0/0/0/28
-----

Sequence num: 1  Num of switchovers: 0

WatchDog Counters:
-----
              NP    Profile    Valid    Current-Cnt    Last-cnt
-----
Prim WDC     0         0         0           3848           12
Prim WDC     1         0         0           3848           12
Prim WDC     2         0         0           3848           12
Prim WDC     3         1         1           3848           12
Back WDC     0         0         0           3848           12
Back WDC     1         0         0           3848           12
Back WDC     2         0         0           3848           12
Back WDC     3         0         0           3848           12
-----

MoFRR Statistics:
-----
NP    Prim pkt rx    Back pkt rx    Interrupts    Punts
-----
0          0          0             0             0
1          0          0             0             0
2          0          0             0             0
3          0          0             1             1
-----

```

This table describes the significant fields shown in the display.

Table 17: show mfib hardware route mofrr Field Descriptions

Field	Description
RPFs	Primary and backup RPF of the route.
A	Currently active RPF for forwarding the traffic to the egress (OLIST). T: means true, F: means false.
MS	Monitoring state. It has three states. MS=0, indicates that the monitoring state disabled. MS=1, indicates that active RPF is monitoring traffic activity. MS=2, indicates that active RPF is monitoring traffic loss.
WDI	Watchdog Count Index. Each MoFRR route has two Line card specific watchdog indexes, associated with primary and backup RPF, respectively.

Field	Description
OIFS	Output Interfaces in the local line card.
Sequence num	MoFRR specific route sequence number.
Num of switchovers	Total number of switchovers triggered by traffic loss detection in the data plane.
Watchdog Counters	Internal Hardware watchdog counters
MoFRR Statistics	Internal software watchdog counters

If there is no MoFRR route enabled in the platform, the output result will be as follows:

```
RP/0/RSP0/CPU0:router# show mfib hardware route mofrr location 0/0/CPU0
LC Type: Trident
No matching routes in MFIB
There are no MoFRR routes configured.
```

Related Commands

Command	Description
show mfib hardware route olist , on page 205	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics , on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary , on page 219	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route , on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrrib route , on page 255	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib hardware route olist

To display platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware, use the **show mfib hardware route olist** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4 hardware route olist** {[*] [*source-address*] [*group-address* [/ *prefix-length*]]} [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
/ <i>prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
location <i>node-id</i>	Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib hardware route olist** command displays the output interface list (olist) for each route. The Multicast Forwarding (MFWD) process stores olist interfaces in a table lookup unit (TLU) block (in groups of three). As such, the command displays each route three times. The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route olist** command. (The output fields are described in the header.)

RP/0/RSP0/CPU0:router# **show mfib hardware route olist location 0/0/CPU0**

LC Type: Trident

Legend:

Route Information - (Ingress)

C: Chip ID, IC: BACL check, IP: Punt this packet to LC CPU,
ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID

Route Information - (Egress)

ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
EV: Valid entry, EC: Count of OLIST members on this chip,
BS: Base of the statistics pointer

Hardware Information

C: Chip ID; T: Table ID; M: Member ID; Intf: Interface, U: uIDB index,
I: HW IC flag, B: HW BACL bit, Base: Base of statistics pointer

Source: * Group: 224.0.0.0 Mask length: 24

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
1	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
2	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x5516c
3	T	F	F	F	F	F	T	T	0x0	0x0	0x8002	0	F	2	T	T	0	0x555a4

Source: * Group: 224.0.1.39 Mask length: 32

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
1	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
2	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x55162
3	F	T	F	F	F	F	T	T	0x0	0x0	0x8000	0	F	0	T	T	0	0x5559a

Source: * Group: 224.0.1.40 Mask length: 32

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
1	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
2	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x55167
3	F	T	F	F	F	F	T	T	0x0	0x0	0x8001	0	F	1	T	T	0	0x5559f

Source: * Group: 227.0.0.0 Mask length: 16

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
1	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
2	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x55199
3	T	F	F	F	F	F	T	T	0x280	0x0	0x8009	0	F	6	T	T	0	0x555d1

Source: * Group: 227.0.0.1 Mask length: 32

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
1	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
2	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
3	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	1	T	5	T	T	3	0x555bd

Interface Information

C	T	M	Intf	U	I	B	Base
3	1	0	Gi0/0/0/8	9	F	F	0x5540c
3	1	1	Gi0/0/0/4	5	F	F	0x5540f
3	1	2	Gi0/0/0/6	7	F	F	0x55412

Source: * Group: 230.0.0.0 Mask length: 8

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
1	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
2	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x55176
3	T	F	T	F	F	F	T	T	0x0	0x0	0x8005	0	F	4	T	T	0	0x555ae

Source: * Group: 232.0.0.0 Mask length: 8

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
1	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
2	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x55171
3	T	F	F	F	F	F	T	T	0x0	0x0	0x8003	0	F	3	T	T	0	0x555a9

Source: * Group: 233.1.0.0 Mask length: 16

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
1	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
2	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x5518f
3	T	F	F	F	F	F	T	T	0x180	0x0	0x8007	0	F	7	T	T	0	0x555c7

Source: * Group: 233.4.0.0 Mask length: 16

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS

show mfib hardware route olist

```

0 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
1 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
2 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x55194
3 T F F F F F T T 0x180 0x0 0x8008 0 F 8 T T 0 0x555cc
-----

```

RP/0/RSP0/CPU0:router# show mfib hardware route olist location 0/4/CPU0

LC Type: A9K-SIP-700

```

Header      : Hardware Route Information
Source      : Source address
Group       : Group Address
M           : Mask Length
C           : Directly connected check flag
RPF         : Accepting interface for non-bidir entries
S           : Signal if packet arrived on RPF interface
IC          : Aggregated Internal copy flag
PR          : Punt to RP flag for Internal copy in the Loopback interface
PK          : PEEK flag
FGID        : Fabric Group ID
MGID        : Multicast Group ID
PAL Olist   : PAL Olist handle
CPP Olist   : CPP Olist handle
Num OCE     : Number of OCE entries

```

```

Header      : Route OCE Entry Information
Interface   : Interface name
Handle      : Interface handle
IC          : Internal copy flag
Accept      : Accept flag
NS          : Negate Signal flag
F/EG        : Forwarding flag

```

Hardware Route Information

```

-----
Source |Group |M |C|RPF |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*      |224.0.0.0 |4 |T|Null |F| F| F|F |0 |16964|0xa6039538 |0x9dc8688c
      |0 |

```

Ingress CPP Prefix Information

```

=====
=== QFP Multicast prefix info ===
Root: a60394c4, Flags: 2 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900100

```

Egress CPP Prefix Information

```

=====
=== QFP Multicast prefix info ===
Root: a60394c4, Flags: 2 First leaf: 0
Number of nodes: 0x000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80100

```

Route OCE Entry Information

Route OLIST Information

```

-----
TREE .. : root : a60394c4 num_nodes 1 num_leaves 0
(in cp) Node: a60394c4 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080060 flags : 0x4
child[0]: [NULL]
child[1]: [NULL]
child[2]: [NULL]
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]

```

```

    child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb00000:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4244
  output_uidb: 0x1fab      counters_ptr: 0x893f5c30
  byte count: 0      packet count: 0

Hardware Route Information
-----
Source      |Group      |M |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |224.0.0.0 |24 |F|Null      |F| F| F|F |0      |16962|0x9e07d2e4      |0x9dc86924
           |0         |
Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9e07d270, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900180

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9e07d270, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80180

Route OCE Entry Information
Route OLIST Information
-----

TREE .. : root : 9e07d270 num_nodes 1 num_leaves 0
(in cp) Node: 9e07d270 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080120 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb00120:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4242
  output_uidb: 0x1fab      counters_ptr: 0x893f5c10
  byte count: 0      packet count: 0

Hardware Route Information
-----
Source      |Group      |M |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |224.0.1.39|32 |F|Null      |T| F| F|F |0      |16960|0x9e07d678      |0x9dc86970
           |0         |
Ingress CPP Prefix Information
-----

```

```

=== QFP Multicast prefix info ===
Root: 9e07d604, Flags: 1 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b9001c0

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9e07d604, Flags: 1 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce801c0

Route OCE Entry Information
Route OLIST Information
-----

TREE .. : root : 9e07d604 num_nodes 1 num_leaves 0
(in cp) Node: 9e07d604 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d080140 flags : 0x4
      child[0]: [NULL]
      child[1]: [NULL]
      child[2]: [NULL]
      child[3]: [NULL]
      child[4]: [NULL]
      child[5]: [NULL]
      child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb000f0:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4240
  output_uidb: 0x1fab      counters_ptr: 0x893f5c00
  byte count: 0      packet count: 0

Hardware Route Information
-----
Source      |Group      |M  |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |224.0.1.40|32 |F|Null      |T| F| F|F |0      |16961|0x9dcbdab4      |0x9dc869bc
           |0         |
Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcdba40, Flags: 1 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b9000c0

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcdba40, Flags: 1 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce800c0

Route OCE Entry Information
Route OLIST Information
-----

TREE .. : root : 9dcdba40 num_nodes 1 num_leaves 0
(in cp) Node: 9dcdba40 num_child:0 cum[wt:0 free:7]

```

```
(in cpp) Node : 0x8d0800c0 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]
```

Route Rx Adjacency Information

```
-----
OCE RX Adj Data for 0x8bb00040:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4241
  output_uidb: 0x1fab      counters_ptr: 0x893f5c40
  byte count: 0      packet count: 0
```

Hardware Route Information

```
-----
Source      |Group      |M |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |225.0.0.0 |32 |T|Se0/4/0/0/1|F| F| F|F |64      |17013|0x9dcbd5a4      |0x9dc86a08
           |2         |
```

Ingress CPP Prefix Information

```
===== QFP Multicast prefix info =====
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900080
```

Egress CPP Prefix Information

```
===== QFP Multicast prefix info =====
Root: 9dcbd530, Flags: 2 First leaf: 9dcbd9bc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80080
```

Route OCE Entry Information

```
-----
Interface  Handle      IC Accept NS      F/EG
-----
Se0/4/0/0/1 0xc000ec0      F T      T      F
```

```
**** Leaf Info (in cp) : [9dcbd9bc]
oce flags = 0x6 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0
```

```
-----
Interface  Handle      IC Accept NS      F/EG
-----
Gi0/4/3/0 0xc000080      F F      T      T
```

```
**** Leaf Info (in cp) : [9dcbd450]
oce flags = 0x5 next obj type : 11 next obj handle : a73e907c
**** Leaf Info (in cpp): [0x8c5800f0]
leaf_flags= 0x1 oce_flags: 0x2 oce_ptr: 0x8c580000
```

Route OLIST Information

```
-----
TREE .. : root : 9dcbd530 num_nodes 1 num_leaves 1
(in cp) Node: 9dcbd530 num_child:1 cum[wt:1 free:6]
(in cpp) Node : 0x8d080080 flags : 0x4
  child[0]: [Leaf] in cp : 9dcbd450 in cpp : 0x8c5800f0
```

show mfib hardware route olist

```

child[1]: [NULL]
child[2]: [NULL]
child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]
child[6]: [NULL]

Route Rx Adjacency Information
-----

OCE RX Adj Data for 0x8bb00160:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x40      pd_32: 0x4275
  output_uidb: 0x1fab      counters_ptr: 0x893f5c50
  byte count: 9800      packet count: 196

Hardware Route Information
-----
Source      |Group      |M  |C|RPF      |S|IC|PR|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
12.12.12.2|225.0.0.0 |64 |F|Se0/4/0/0/1|F| F| F|F |64   |17024|0x9dcbcecc      |0x9dc86a54
      |2      |

Ingress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900200

Egress CPP Prefix Information
-----

=== QFP Multicast prefix info ===
Root: 9dcbcfb0, Flags: 0 First leaf: 9dcbccfc
Number of nodes: 0x000001, leaves: 0x000001 RPF i/f: 0x007fff
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80200

Route OCE Entry Information
-----
Interface  Handle      IC Accept NS      F/EG
-----
Se0/4/0/0/1 0xc000ec0      F T      F      F

**** Leaf Info (in cp) : [9dcbccfc]
oce flags = 0x2 next obj type : 11 next obj handle : a73e9104
**** Leaf Info (in cpp): [0]
leaf_flags= 0x1 oce_flags: 0 oce_ptr: 0x8c5800c0

-----
Interface  Handle      IC Accept NS      F/EG
-----
Gi0/4/3/0 0xc000080      F F      T      T

**** Leaf Info (in cp) : [9dcbcdcc]
oce flags = 0x5 next obj type : 11 next obj handle : a73e907c
**** Leaf Info (in cpp): [0x8c5800d0]
leaf_flags= 0x1 oce_flags: 0x2 oce_ptr: 0x8c580000

Route OLIST Information
-----

TREE .. : root : 9dcbcfb0 num_nodes 1 num_leaves 1
(in cp) Node: 9dcbcfb0 num_child:1 cum[wt:1 free:6]
(in cpp) Node : 0x8d080000 flags : 0x4
child[0]: [Leaf] in cp : 9dcbcdcc in cpp : 0x8c5800d0
child[1]: [NULL]
child[2]: [NULL]

```



```

child[3]: [NULL]
child[4]: [NULL]
child[5]: [NULL]
child[6]: [NULL]

```

Route Rx Adjacency Information

```

OCE RX Adj Data for 0x8bb00050:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x40      pd_32: 0x4280
  output_uidb: 0x1fab      counters_ptr: 0x893f5c60
  byte count: 348116500      packet count: 6962330

```

Hardware Route Information

```

Source      |Group      |M |C|RPF      |S|I|C|P|R|PK|FGID |MGID |PAL Olist Handle|CPP OLIST
Handle|Num OCE|
-----
*           |232.0.0.0 |8  |F|Null      |F|F|F|F|F|0      |16963|0x9e07d184      |0x9dc868d8
           |0          |

```

Ingress CPP Prefix Information

```

=== QFP Multicast prefix info ===
Root: 9e07d110, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8b900140

```

Egress CPP Prefix Information

```

=== QFP Multicast prefix info ===
Root: 9e07d110, Flags: 0 First leaf: 0
Number of nodes: 0x0000001, leaves: 00000000 RPF i/f: 00000000
RPF Fast Convergence flags: 00000000 Secondary RPF: 00000000
RPF Fast Convergence timer: 0 ext_leaf: 0x8ce80140

```

Route OCE Entry Information

Route OLIST Information

```

TREE .. : root : 9e07d110 num_nodes 1 num_leaves 0
(in cp) Node: 9e07d110 num_child:0 cum[wt:0 free:7]
(in cpp) Node : 0x8d0800e0 flags : 0x4
  child[0]: [NULL]
  child[1]: [NULL]
  child[2]: [NULL]
  child[3]: [NULL]
  child[4]: [NULL]
  child[5]: [NULL]
  child[6]: [NULL]

```

Route Rx Adjacency Information

```

OCE RX Adj Data for 0x8bb00080:
  base: 39(CPP HW RX ADJ IPV4 MCAST)      adj_flags: 0x0
  pd_16: 0x0      pd_32: 0x4243
  output_uidb: 0x1fab      counters_ptr: 0x893f5c20
  byte count: 0      packet count: 0

```

The following is sample output from the **show mfib hardware route olist** command with only one multicast group:

```
RP/0/RSP0/CPU0:router# show mfib hardware route olist 227.0.0.1 location 0/0/CPU0
```

Legend:

Route Information - (Ingress)

show mfib hardware route olist

C: Chip ID, IC: BACL check, IP: Punt this packet to LC CPU,
 ID: Directly connected, IS: RPF interface signal, IU: Punt copy to RP,
 IF: Punt to LC CPU if forwarded, IM: Result match, IV: Valid entry,
 IR: RPF IF, IA: Fabric slotmask, IG: Multicast group ID
 Route Information - (Egress)
 ET: Table ID to be used for OLIST lookup, EO: OLIST count bit,
 ER: Route MGID to be used for OLIST/NRPF lookup, EM: Result match,
 EV: Valid entry, EC: Count of OLIST members on this chip,
 BS: Base of the statistics pointer
 Hardware Information
 C: Chip ID; T: Table ID; M: Member ID; Intf: Interface, U: uIDB index,
 I: HW IC flag, B: HW BACL bit, Base: Base of statistics pointer

Source: * Group: 227.0.0.1 Mask length: 32

Route Information

C	IC	IP	ID	IS	IU	IF	IM	IV	IR	IA	IG	ET	EO	ER	EM	EV	EC	BS
0	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
1	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
2	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	0	F	5	T	T	0	0x55185
3	T	F	F	F	F	F	T	T	0x0	0x1	0x8004	1	T	5	T	T	3	0x555bd

Interface Information

C	T	M	Intf	U	I	B	Base
3	1	0	Gi0/0/0/8	9	F	F	0x5540c
3	1	1	Gi0/0/0/4	5	F	F	0x5540f
3	1	2	Gi0/0/0/6	7	F	F	0x55412

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 192	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route statistics, on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary, on page 219	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route statistics

To display platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route, use the **show mfib hardware route statistics** command in EXEC mode.

show mfib [**vrf** *vrf-name*] **ipv4** **hardware route statistics** [**detail**] [*****] [*source-address*] [*group-address* /*prefix-length*]] [**location** *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
*	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) IP address or hostname of the multicast route source.
<i>group-address</i>	(Optional) IP address or hostname of the multicast group.
<i>/ prefix-length</i>	(Optional) Prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value.
detail	(Optional) Displays a detailed list of the routing database.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware route statistics** command to display the hardware packet and byte counter for a route. Route counters are kept for (S, G) routes only. A single set of counters is provided for all (*, G) routes.

This command displays the hardware packet and bytes count on a per-route basis. Per-route hardware counters are kept for (S, G) routes only. However, counters are managed dynamically and allocated on a priority basis and may not be available for each (S, G) route. There is a single set of counters for all

(* , G) routes. For example, interface counters and access list counters have higher priority than route counters.

**Note**

Route counters are local to each line card.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route statistics** command.

```
RP/0/RSP0/CPU0:router# show mfib hardware route statistics location 0/4/CPU0
```

LC Type: A9K-SIP-700

Hardware Prefix Statistics

```
-----
(s, g) RX/TX: Pkt/Byte:      Forward(Pkt/Byte) Punt(Pkt/Byte) RPF Fail(Pkt/Byte) Drop(Pkt/Byte)
-----
(*      , 224.0.0.0 ) RX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.0.0 ) TX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.0.0 ) RX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.0.0 ) TX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.1.39) RX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.1.39) TX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.1.40) RX: 0/0                      0/0                      0/0
0/0
(*      , 224.0.1.40) TX: 0/0                      0/0                      0/0
0/0
(*      , 225.0.0.0 ) RX: 196/9016                  1/46                      0/0
0/0
(*      , 225.0.0.0 ) TX: 196/9016                  0/0                      0/0
0/0
(12.12.12.2, 225.0.0.0 ) RX: 7931284/364839064      3/138                      0/0
0/0
(12.12.12.2, 225.0.0.0 ) TX: 7931288/364839248      0/0                      0/0
0/0
(*      , 232.0.0.0 ) RX: 0/0                      0/0                      0/0
0/0
(*      , 232.0.0.0 ) TX: 0/0                      0/0                      0/0
0/0
-----
```

```
RP/0/RSP0/CPU0:router# show mfib hardware route statistics location 0/0/CPU0
```

LC Type: Trident

Legend:

S: Source, G: Group, Pr: Prefix Length, C: Chip ID, R: Received,
P: Punted to CPU, F: Forwarded, ID: Ingress Drop, ED: Egress Drop

```
S: *   G: 224.0.0.0   Pr:24
-----
```

```

C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 224.0.1.39   Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 224.0.1.40   Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 227.0.0.1    Pr:32
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      504844:30290640 / 504843:23222778 / 504856 / 0 / 0
-----
Interface Statistics:
-----
Interface      F/P/D (packets:bytes)
-----
Gi0/0/0/8      504843:23222778 / 0:0 / 0:0
Gi0/0/0/4      0:0 / 0:0 / 0:0
Gi0/0/0/6      504843:23222778 / 0:0 / 0:0
-----

S: 4.0.0.2   G: 227.0.0.1   Pr:64
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      3869:232140 / 3869:177974 / 0 / 0 / 0
-----
Interface Statistics:
-----
Interface      F/P/D (packets:bytes)
-----
Gi0/0/0/4      0:0 / 0:0 / 0:0
Gi0/0/0/8      3869:177974 / 0:0 / 0:0
Gi0/0/0/6      3869:177974 / 0:0 / 0:0
-----

S: *   G: 230.0.0.0    Pr:8
-----
C      R(packets:bytes)/F(packets:bytes)/P(packets)/ID(packets)/ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0

```

show mfib hardware route statistics

```

2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route

S: *   G: 232.0.0.0   Pr:8
-----
C      R(packets:bytes) / F(packets:bytes) / P(packets) / ID(packets) / ED(packets)
-----
0      0:0 / 0:0 / 0 / 0 / 0
1      0:0 / 0:0 / 0 / 0 / 0
2      0:0 / 0:0 / 0 / 0 / 0
3      0:0 / 0:0 / 0 / 0 / 0
-----
No OLIST interfaces found for this route
This table describes the significant fields shown in the display.

```

Table 18: show mfib hardware route statistics Field Descriptions

Field	Description
Ingress Counter	Unique identifier of the ingress counter.
Egress Counter	Unique identifier of the egress counter.
Forward	Number of forwarded packets and bytes.
Punt	Number of bytes punted from the line card CPU.
Drop	Number of dropped bytes.

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 192	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 205	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route summary, on page 219	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware route summary

To display summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry, use the **show mfib hardware route summary** command in EXEC mode.

show mfib [*vrf vrf-name*] **ipv4** **hardware route summary** **location** *node-id*

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show mfib hardware summary** command to display hardware information for the route of the node.

The hardware information of MoFRR (multicast only fast reroute) enabled routes are also displayed. In IOS XR Software Release 3.9.0, the maximum platform supported MoFRR routes are 1024.

The longest-prefix match route is displayed depending on the provided source and group addresses. The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib hardware route summary** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/1/cpu0
```

```
LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
  No. of (*,G) routes = 5
  No. of (S,G) routes = 10
```

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/0/CPU0
```

```
LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
  No. of (*,G) routes = 6
  No. of (S,G) routes = 5
  No. of (S,G) MoFRR routes = 0,    Maximum supported MoFRR routes = 1024
```

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/4/cPU0
```

```
LC Type: A9K-SIP-700
Hardware IP Multicast Forwarding Information Base Route Summary
Number of hardware (*, G) routes = 6
Number of hardware (S, G) routes = 1
Number of hardware route-interfaces = 4
Number of hardware Rx adjacencies = 7
Number of hardware Tx adjacencies = 3
Number of ref to decap adjacency = 0
Mvpn master LC status = False
```

If there is no MoFRR configured in the platform:

```
RP/0/RSP0/CPU0:router# show mfib hardware route summary location 0/0/CPU0
```

```
LC Type: Trident
H/W IP Multicast Forwarding Information Base Summary
  No. of (*,G) routes = 6
  No. of (S,G) routes = 5
  No. of (S,G) MoFRR routes = 0,    Maximum supported MoFRR routes = 1024
```

This table describes the significant fields shown in the display.

Table 19: show mfib hardware route summary Field Descriptions

Field	Description
No. of (*,G) routes	Number of (*,G) routes installed in hardware.
No. of (S,G) routes	Number of (S,G) routes installed in hardware.
No. of (S,G) MoFRR routes	Number of MoFRR (S,G) routes installed in hardware.
Maximum supported MoFRR routes	Maximum number of MoFRR routes supported in hardware.

Related Commands

Command	Description
show mfib hardware route accept-bitmap , on page 192	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.

Command	Description
show mfib hardware route mofrr , on page 199	Displays the platform-specific Multicast Forwarding Information Base (MFIB) information for the MoFRR (multicast only fast reroute)- enabled list stored in the hardware.
show mfib hardware route olist , on page 205	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics , on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib route , on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mfib hardware table

To display the platform-specific multicast table information for the Multicast Forwarding Information Base (MFIB) in the hardware, use the **show mfib hardware table** command in EXEC mode.

show mfib [*vrf vrf-name*] [*ipv4|ipv6*] **hardware table** [*detail*] [*location node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
detail	(Optional) Displays detailed platform-specific multicast table information.
location <i>node-id</i>	(Optional) Specifies the MFIB location.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.



Note

The command does not display any useful output if only RSP is specified or if no location is specified.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of the **show mfib hardware table** command:

```
RP/0/RSP0/CPU0:router# show mfib hardware table detail location 0/1/CPU0
```

LC Type: Trident

Legend:

NP: Network Processor, MNP: Master NP, SW OC: Software OLIST Count
TID: Table ID, MLC: Master Linecard (PD Flag)
MNP_id: Master NP ID, C_NP_MASK: Composite NP Mask

NP MNP SW OC

0 F 0
1 F 0
2 F 0
3 F 0

TID MLC MNP_id C_NP_MASK

0x0 F 0 0x0

This table describes the significant fields shown in the display.

Table 20: show mfib hardware table Field Descriptions

Field	Description
NP	Specifies the network processor.
MNP	Specifies the master network processor.
SW OC	Specifies the software OLIST count.
TID	Specifies the Table ID.

show mfib interface

To display interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process, use the **show mfib interface** command in EXEC mode.

show mfib [**vrf** *vrf-name*] **ipv4 interface** [*type interface-path-id*] [**detail**] **route**] [**location** *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Specifies detailed information for packet statistics on interfaces.
route	(Optional) Specifies a list of routes associated with the interface. This option is available if an interface <i>type</i> and <i>instance</i> are specified.
location <i>node-id</i>	(Optional) Specifies packet statistics associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib interface** command displays counters for the number of packets and bytes that are handled by software switching. Counters for packets processed by hardware are displayed by the appropriate **show mfib hardware** command.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib interface** command for the multicast route on node 0/2/CPU0 that is associated with the Gigabit Ethernet interface 0/2/0/2:

```
RP/0/RSP0/CPU0:router# show mfib interface GigE 0/2/0/2 location 0/2/CPU0
```

```
Interface : GigE0/2/0/2 (Enabled)
```

```
Mcast pkts in : 5839, Mcast pkts out : 0 TTL Threshold : 0 Ref Count : 18
```

The following is sample output from the **show mfib interface** command with the **detail** and **location** keywords specified:

```
RP/0/RSP0/CPU0:router# show mfib interface detail location 0/2/CPU0
```

```
Interface : FINT0/2/CPU0 [0x3000000] (Disabled) PHYSICAL Create Unknown Mcast pkts in: 0,
Mcast pkts out: 0 TTL Threshold : 0, VRF ID: 0x60000000, Multicast Adjacency Ref Count: 2,
Route Count: 0, Handle: 0x3000000 Primary address : 0.0.0.0/32 Secondary address : 0.0.0.0/32
```

```
Interface : GigE0/2/0/2 [0x3000900] (Enabled) PHYSICAL Create Rcvd Mcast pkts in: 5844,
Mcast pkts out: 0 TTL Threshold : 0, VRF ID: 0x60000000, Multicast Adjacency Ref Count: 18,
Route Count: 15, Handle: 0x3000900 Primary address : 112.112.112.203/24 Secondary address
: 0.0.0.0/32
```

This table describes the significant fields shown in the display.

Table 21: show mfib interface Field Descriptions

Field	Description
Interface	Interface name. Enabled if the interface is configured for multicast routing. The word “PHYSICAL” is displayed if the interface is a nonvirtual interface.
Mcast pkts in	Number of incoming multicast packets entering the interface during software switching.
Mcast pkts out	Number of outgoing multicast packets exiting the interface during software switching.
TTL Threshold	Number of multicast packets that reach the configured multicast time-to-live threshold.
VRF ID	VPN Routing and Forwarding instance ID.
Ref Count	Number of references to this interface structure in the MFIB process.

 show mfib interface

Field	Description
Primary address	Primary IP address of the interface.
Secondary address	Secondary IP address of the interface.

Related Commands

Command	Description
show mfib hardware interface , on page 180	Displays hardware switching interface information for the Multicast Forwarding Information Base (MFIB) process.

show mfib nsf

To display the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards, use the **show mfib nsf** command in EXEC mode.

show mfib [**ipv4**] **nsf** [**location** *node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
location <i>node-id</i>	(Optional) Specifies the MFIB NSF designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mfib nsf** command displays the current multicast NSF state for the MFIB process contained on all line cards and route processors (RPs) in the router.

For multicast NSF, the state may be one of the following:

- **Normal**—Normal operation: The MFIBs in the card contain only up-to-date MFIB entries.
- **Boot Card Booting**—Card is initializing and has not yet determined its NSF state.
- **Not Forwarding**—Multicast Forwarding Disabled: Multicast routing failed to recover from a failure-induced NSF state prior to the MFIB NSF timeout.
- **Non-stop Forwarding Activated**—Multicast NSF active: The router is operating in NSF mode while attempting to recover from a control-plane failure. In this mode, data is forwarded based on MFIB entries that are either updated by the recovered Multicast Routing Information Base (MRIB), or MFIB entries that were marked stale when NSF mode began. The times remaining until multicast NSF and multicast-unicast NSF expiration are displayed.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib nsf** command:

```
RP/0/RSP0/CPU0:router# show mfib nsf

IP MFWD Non-Stop Forwarding Status:
  NSF Lifetime: 00:15:00

On node 0/1/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:54

On node 0/3/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:54

On node 0/4/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:53

On node 0/6/CPU0 :
Multicast routing state: Non-Stop Forwarding is activated
NSF Time Remaining: 00:14:53
```

This table describes the significant fields shown in the display.

Table 22: show mfib nsf Field Descriptions

Field	Description
IP MFWD Non-Stop Forwarding Status	MFIB NSF status of each node in the system: booting, normal, not forwarding, or activated.
NSF Time Remaining	If MSB NSF is activated, the time remaining until NSF fails and all routes are deleted displays. Before timeout, MRIB signals that NSF (in the control plane) is finished and new, updated routes are populated in the MFIB (which makes the transition to Normal status).

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP.
nsf (multicast) , on page 166	Configures the NSF capability for the multicast routing system.

Command	Description
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mrib nsf , on page 251	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show mfib route

To display route entries in the Multicast Forwarding Information Base (MFIB), use the **show mfib route** command in EXEC mode.

show mfib [**vrf** *vrf-name*] **ipv4** **route** [**rate** ***] *source-IP-address* *group-IP-address* **prefix-length** **detail** **summary** **location** *node-id*]

Syntax Description

*	(Optional) Display shared tree entries.
<i>source-IP-address</i>	(Optional) IP address or hostname of the multicast route source. Format is: <i>A.B.C.D</i>
<i>group-IP-address</i>	(Optional) IP address or hostname of the multicast group. Format is: <i>A.B.C.D</i>
<i>/prefix-length</i>	(Optional) Group IP prefix length of the multicast group. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). Format is: <i>A.B.C.D/length</i>
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
detail	(Optional) Specifies detailed route information.
location <i>node-id</i>	(Optional) Specifies an MFIB-designated node.
rate	(Optional) Displays individual (S, G) rates.
sources-only	(Optional) Restricts display of any shared-tree entries.
summary	(Optional) Displays a brief list of the routing database.
tech-support	(Optional) Displays technical support information.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All entries in the MFIB table are derived from the Multicast Routing Information Base (MRIB). The flags have the same connotation as in the MRIB. The flags determine the forwarding and signaling behavior according to a set of forwarding rules for multicast packets. In addition to the list of interfaces and flags, each route entry shows various counters. Byte count is the number of total bytes forwarded. Packet count is the number of packets received for this entry.

The **show mfib counter** command displays global counters independent of the routes.

This command displays counters for the number of packets and bytes that are handled by software switching. Counters for packets processed by hardware are displayed by the appropriate **show mfib hardware** command.

The command displays the cumulative rates per route for all line cards in the Multicast Forwarding Information Base (MFIB) table when the **rate** keyword is used with the source and group IP addresses.

The show mfib route rate command is not supported on interfaces such as bundle virtual interfaces and Bridge Group virtual interfaces (BVI).

The command displays the rate per route for one line card in Multicast Forwarding Information Base (MFIB) table when the **statistics** keyword is used.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib route** command with the **location** keyword specified (the output fields are described in the header):

```
RP/0/RSP0/CPU0:router# show mfib route location 0/1/CPU0

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
             IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
             ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
             MH - MDT interface handle, CD - Conditional Decap,
             DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
               NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
               EG - Egress, EI - Encapsulation Interface, MI - MDT Interface
Forwarding Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other

(*,224.0.0.0/24),   Flags: D
Up: 02:16:52
Last Used: never
```

show mfib route

```

SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0

(*,224.0.1.39),   Flags:  S
Up: 02:16:52
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0

(*,224.0.1.40),   Flags:  S
Up: 02:16:52
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0

(*,227.0.0.1),    Flags:  C
Up: 02:16:51
Last Used: 02:16:50
SW Forwarding Counts: 282/0/0
SW Failure Counts: 205/0/0/0/0
GigabitEthernet0/0/0/4 Flags:  NS EG, Up:02:16:46
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:16:50
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:16:50

(4.0.0.2,227.0.0.1),   Flags:
Up: 02:16:50
Last Used: 00:00:12
SW Forwarding Counts: 125/0/0
SW Failure Counts: 0/0/0/0/0
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:16:50
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:16:50
GigabitEthernet0/0/0/4 Flags:  A EG, Up:02:16:50

(*,232.0.0.0/8),     Flags:  D
Up: 02:16:52
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0

```

The following is sample output from the **show mfib route** command with the **summary** and **location** keywords specified:

```

RP/0/RSP0/CPU0:router# show mfib route summary location 0/0/CPU0
IP Multicast Forwarding Information Base Summary for VRF default
No. of (*,G) routes = 5
No. of (S,G) routes = 1

```

The following is sample output from the **show mfib route** command with the **statistics** and **location** keywords specified. If the hardware counters show N/A, it means no hardware statistic blocks were assigned to the route. However, routes may show that both hardware and software statistic blocks are assigned. The output fields are described in the header.

```

RP/0/RSP0/CPU0:router# show mfib route statistics location 0/0/CPU0
IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
MH - MDT interface handle, CD - Conditional Decap,
DT - MDT Decap True
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
EG - Egress, EI - Encapsulation Interface, MI - MDT Interface
SW/HW Forwarding Counts: Packets in/Packets out/Bytes out
SW Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
HW Drop Counts: Ingress / Egress
HW Forwarding Rates: bps In/pps In/bps Out/pps Out

(*,224.0.0.0/24),   Flags:  D
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0

```

```

SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.1.39),   Flags:  S
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,224.0.1.40),   Flags:  S
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

(*,227.0.0.1),   Flags:  C
Up: 02:21:14
Last Used: 02:21:14
SW Forwarding Counts: 282/0/0
SW Failure Counts: 205/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A
GigabitEthernet0/0/0/4 Flags:  NS EG, Up:02:21:10
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:21:14

(4.0.0.2,227.0.0.1),   Flags:
Up: 02:21:14
Last Used: 00:01:06
SW Forwarding Counts: 128/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 8474282/8474283/389817018
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A
GigabitEthernet0/0/0/8 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/6 Flags:  NS EG, Up:02:21:14
GigabitEthernet0/0/0/4 Flags:  A EG, Up:02:21:14

(*,232.0.0.0/8),   Flags:  D
Up: 02:21:15
Last Used: never
SW Forwarding Counts: 0/0/0
SW Failure Counts: 0/0/0/0
HW Forwarding Counts: 0/0/0
HW Drop Counts: 0/0
HW Forwarding Rates: N/A /N/A /N/A /N/A

```

The following is a sample output for MoFRR enabled route without and with the detail keyword:

```
RP/0/RSP0/CPU0:router# show mfib route
```

```

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
             IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
             ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
             MH - MDT interface handle, CD - Conditional Decap,
             DT - MDT Decap True, EX - Extranet
             MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
                NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
                EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
                EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other

```

show mfib route

```

(20.20.20.1,225.0.0.1),    Flags:  MoFE MoFS
Up: 03:22:30
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
GigabitEthernet0/0/0/8 Flags:  A, Up:03:22:30
GigabitEthernet0/0/0/18 Flags:  A2, Up:03:22:30
GigabitEthernet0/0/0/28 Flags:  NS, Up:03:22:30

(20.20.20.1,225.0.0.2),    Flags:  MoFE MoFS
Up: 03:22:30
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
GigabitEthernet0/0/0/8 Flags:  A, Up:03:22:30
GigabitEthernet0/0/0/18 Flags:  A2, Up:03:22:30
GigabitEthernet0/0/0/28 Flags:  NS, Up:03:22:30

```

In the above command, A flag represents the primary RPF of the MoFRR route, and A2 flag represents the backup RPF of the MoFRR route.

```
RP/0/RSP0/CPU0:router# show mfib route detail
```

```

IP Multicast Forwarding Information Base
Entry flags: C - Directly-Connected Check, S - Signal, D - Drop,
IA - Inherit Accept, IF - Inherit From, MA - MDT Address,
ME - MDT Encap, MD - MDT Decap, MT - MDT Threshold Crossed,
MH - MDT interface handle, CD - Conditional Decap,
DT - MDT Decap True, EX - Extranet
MoFE - MoFRR Enabled, MoFS - MoFRR State
Interface flags: F - Forward, A - Accept, IC - Internal Copy,
NS - Negate Signal, DP - Don't Preserve, SP - Signal Present,
EG - Egress, EI - Encapsulation Interface, MI - MDT Interface,
EX - Extranet, A2 - Secondary Accept
Forwarding/Replication Counts: Packets in/Packets out/Bytes out
Failure Counts: RPF / TTL / Empty Olist / Encap RL / Other
(20.20.20.1,225.0.0.1),    Flags:  MoFE MoFS
Up: 03:25:31
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
Route ver: 0x4a13
MVPN Info :-
  MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
  MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
MOFRR State: Inactive Sequence No 1
GigabitEthernet0/0/0/8 Flags:  A, Up:03:25:31
GigabitEthernet0/0/0/18 Flags:  A2, Up:03:25:31
GigabitEthernet0/0/0/28 Flags:  NS, Up:03:25:31
(20.20.20.1,225.0.0.2),    Flags:  MoFE MoFS
Up: 03:25:31
Last Used: never
SW Forwarding Counts: 0/0/0
SW Replication Counts: 0/0/0
SW Failure Counts: 0/0/0/0/0
Route ver: 0x443e
MVPN Info :-
  MDT Handle: 0x0, MDT Probe:N [N], Rate:N, Acc:N
  MDT SW Ingress Encap V4/V6, Egress decap: 0 / 0, 0
MOFRR State: Inactive Sequence No 1
GigabitEthernet0/0/0/8 Flags:  A, Up:03:25:31
GigabitEthernet0/0/0/18 Flags:  A2, Up:03:25:31
GigabitEthernet0/0/0/28 Flags:  NS, Up:03:25:31

```

The detail option illustrates the MoFRR state of each MoFRR route. At any moment, only one RPF forwards the traffic to the egress. The inactive state means the primary RPF forwards the traffic to the egress. The active state means that the backup RPF forwards the traffic to the egress. The sequence number reflects the number of switchovers of the MoFRR route.

Related Commands

Command	Description
show mfib counter, on page 176	Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.
show mfib hardware route accept-bitmap, on page 192	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 205	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib interface, on page 224	Displays interface-related information used during software multicast switching in the Multicast Forwarding Information Base (MFIB) process.
show mrrib route, on page 255	Displays all entries in the Multicast Routing Information Base (MRIB).

show mfib table-info

To display Multicast Forwarding Information Base (MFIB) table information, use the **show mfib table-info** command in EXEC mode.

show mfib ipv4 table-info {*table-id*| *vrf-name*} [**local**| **remote**] [**location** *node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
<i>table-id</i>	Specifies the table identifier. Range is 0 to 4294967295.
<i>vrf-name</i>	Specifies the VRF name.
local	Specifies local tables only.
remote	Specifies remote tables only.
location <i>node-id</i>	(Optional) Specifies MFIB connections associated with an interface of the designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mfib table-info** command:

```
RP/0/RSP0/CPU0:router# show mfib table-info table-id location 0/0/CPU0
```

```
Table Name           : default
VRid/TID/VID         : 0x0 / 0xe0000000 / 0x60000000
Table type           : TBL_TYPE_TID
Active/Linked        : Y /~Y
Prev Table ID        : 0x0
Location             : Local
Local ifcount        : 16
Default MDT Encap    : (*, */32)
MDT Master LC        : N
Loopback (Encap Src) : 0x0 (Ha0x0)
Local EG intf cnt    : 6
Data MDT             : Acl - (-), All vrf routes N, 0 Kbps
```

```
RP/0/RSP0/CPU0:router#show mfib table-info vrf 101
```

```
Table Name           : vrf15
VRid/TID/VID         : 0x0 / 0xe000000f / 0x6000000f
Table type           : TBL_TYPE_NAME_VID
Active/Linked        : Y /~Y
Prev Table ID        : 0x0
Location             : Local
Local ifcount        : 2
Child routes         : (5.5.5.5, 225.101.1.15/32)
```

```
Default MDT Handle   : 0x0 (Ha0x0)
```

```
MDT Master LC        : Y
Loopback (Encap Src) : 0x9000180 (Loopback0)
Local EG intf cnt    : 508
Data MDT             : Acl - (-), All vrf routes N, 0 Kbps
```

This table describes the significant fields shown in the display.

Table 23: show mfib table-info Field Descriptions

Field	Description
Table Name	Name of the MFIB table.
VRid/TID/VID	Table identifiers.
Table type	Type of MFIB table.
Active/Linked	Table is active and linked.
Location	Location of the MFIB table.
Local ifcount	Local interface count.
Child routes	Child routes shows the number of extranet routes in receiver VRFs that reference this source VRF.
Default MDT Encap	Default MDT encapsulation.

Field	Description
Default MDT Handle	Default MDT interface handle for this VRF.
MDT Master LC	Field contains "Y" if this line card is a master line card for this VRF.
Loopback (Encap Src)	Loopback (encapsulation source).
Local EG intf cnt	Shows the number of local egress interfaces for this VRF and location.
Data MDT	Routes for which multicast data for a multicast distribution tree (MDT) was triggered.

show mhost default-interface

To display the active default interface for the Multicast Host (MHost) process, use the **show mhost default-interface** command in EXEC mode.

show mhost ipv4 default-interface

Syntax Description	ipv4	(Optional) Specifies IPv4 address prefixes.
	ipv6	(Optional) Specifies IPv6 address prefixes.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs.

The **show mhost default-interface** command is used to show both the configured and active MHost default interfaces. The configured interface is the one specified by the **mhost default-interface** command; otherwise, the configured interface is displayed as none.

The active interface is the one currently being used as the default. The active interface may differ from the one configured when multicast routing is enabled and the configured interface is not operational. This command is useful when applications such as ping, or MTrace are not functioning as expected.

Task ID	Task ID	Operations
	network	read

Examples The following is sample output for the **show mhost default-interface** command that shows that loopback interface 0 was configured as the MHost default interface, and it is the active default interface:

```
RP/0/RSP0/CPU0:router# show mhost default-interface
```

 show mhost default-interface

```
mhost configured default interface is 'Loopback0'  
mhost active default interface is 'Loopback0'
```

Related Commands

Command	Description
mhost default-interface , on page 159	Configures the default interface for IP multicast transmission and reception to and from the host stack.

show mhost groups

To display various multicast groups joined directly on the interface, use the **show mhost groups** command in EXEC mode.

show mhost [**ipv4**] **groups** *type interface-path-id* [**location** *node-id*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location <i>node-id</i>	(Optional) Specifies a designated node.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mhost groups** command is used to display the groups joined by applications and verifies that the MHost application is functioning properly.

Task ID

Task ID	Operations
network	read

Examples

The following is sample output from the **show mhost groups** command that shows the MHost groups 239.1.1.1, 224.0.0.22, 224.0.0.2, 224.0.0.1, 224.0.0.13, and 224.0.1.40 have joined on loopback 0 interface:

```
RP/0/RSP0/CPU0:router# show mhost groups loopback 0

Loopback 0
239.1.1.1 : includes 1, excludes 0, mode INCLUDE
33.3.3.3 : includes 1, excludes 0, active in INCLUDE filter
224.0.0.22 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.2 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.1 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.0.13 : includes 0, excludes 1, mode EXCLUDE
<no source filter>
224.0.1.40 : includes 0, excludes 2, mode EXCLUDE
<no source filter>
```

This table describes the significant fields shown in the display.

Table 24: show mhost groups Field Descriptions

Field	Description
includes	Number of source addresses in the include list.
excludes	Number of source addresses in the exclude list.
mode	Multicast socket filter mode: include or exclude.
33.3.3.3	Source address list to be included or excluded based on the multicast filter mode.

Related Commands

Command	Description
show mfib hardware route accept-bitmap, on page 192	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the interface list that accepts bidirectional routes.
show mfib hardware route olist, on page 205	Displays platform-specific Multicast Forwarding Information Base (MFIB) information in the output interface list (olist) stored in the hardware.
show mfib hardware route statistics, on page 215	Displays platform-specific Multicast Forwarding Information Base (MFIB) information for the packet and byte counters for each route.
show mfib hardware route summary, on page 219	Displays summary platform-specific Multicast Forwarding Information Base (MFIB) hardware information for each route entry.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).

show mrib client

To display the state of the Multicast Routing Information Base (MRIB) client connections, use the **show mrib client** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 client** [*filter*] [*client-name*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.
filter	(Optional) Displays route and interface level flag changes that various MRIB clients have registered and shows what flags are owned by the MRIB clients.
<i>client-name</i>	(Optional) Name of a multicast routing protocol that acts as a client of MRIB, such as Protocol Independent Multicast (PIM) or Internet Group Management Protocol (IGMP).

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib client** command using the **filter** option:

```
RP/0/RSP0/CPU0:router# show mrib client filter

IP MRIB client-connections
igmp:417957 (connection id 0)
  ownership filter:
    interface attributes: II ID LI LD
    groups:
      include 0.0.0.0/0
    interfaces:
      include All
pim:417959 (connection id 1)
  interest filter:
    entry attributes: E
    interface attributes: SP II ID LI LD
    groups:
      include 0.0.0.0/0
    interfaces:
      include All
  ownership filter:
    entry attributes: L S C IA IF D
    interface attributes: F A IC NS DP DI EI
    groups:
      include 0.0.0.0/0
    interfaces:
      include All
bcdl_agent:1 (connection id 2)
  interest filter:
    entry attributes: S C IA IF D
    interface attributes: F A IC NS DP SP EI
    groups:
      include 0.0.0.0/0
    interfaces:
      include All
  ownership filter:
    groups:
      include 0.0.0.0/0
    interfaces:
      include All
```

This table describes the significant fields shown in the display.

Table 25: show mrib client Field Descriptions

Field	Description
igmp	Name of the client.
417957	Personal identifier (PID) or a unique ID assigned by MRIB.
(connection id 0)	Unique client connection identifier.
ownership filter:	Specifies all the route entry and interface-level flags that are owned by the client. As the owner of the flag, only the client can add or remove the flag. For example, only the Internet Group Management Protocol (IGMP) client can add the II flag on an interface. MRIB does not allow a non-owner to register or modify the same flag.

Field	Description
groups: include 0.0.0.0/0 interfaces: include All	Groups and interfaces registered by the clients consisting of two lists. One is an include list (items for which the client requests to be notified.) The use of “All” implies all interfaces and 0.0.0.0/0 to indicate all groups. Not shown in this example is the exclude list. This list contains items for which the client requests not to be notified when modifications occur.
interface attributes: II ID LI LD	Interface-level flags set on the interface belong to a route.
interest filter:	Specifies all the flags, groups, and interfaces from which the client requests information. When a flag of interest for a client is modified, the client is notified.
entry attributes: S C IA IF D	Entry-level flags that are set on the route.

Related Commands

Command	Description
show mfib nsf, on page 227	Displays the state of a nonstop forwarding (NSF) operation for the Multicast Forwarding Information Base (MFIB) line cards.
show mfib route, on page 230	Displays route entries in the Multicast Forwarding Information Base (MFIB).
show mrib nsf, on page 251	Displays the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB).

show mrib mpls forwarding

To display the Multicast Routing Information Base (MRIB) MPLS forwarding table information of all tunnels, use the **show mrib mpls forwarding** command in EXEC mode.

show mrib mpls forwarding [**detail**| **labels**| **s2l**| **source**| **summary**| **tunnels**]

Syntax Description

detail	Provides the detail information of each tunnel.
labels	Filters based on label.
s2l	Filters based on s2l.
source	Filters based on source PE address.
summary	Displays the summary output of entries.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is a sample output from the **show mrib mpls forwarding** command:

```
RP/0/RSP0/CPU0:router# show mrib mpls forwarding
LSP information (RSVP-TE) :
  Name: tunnel-mte26 Role: Head State: binding
```

```

TUNNEL-ID: 26 P2MP-ID: 26 LSP-ID: 10012
Source Address: 192.1.1.1 Extended-ID: 192.1.1.1(0xc0010101)

Incoming Label      : (16008)
Transported Protocol : IPv4
Explicit Null       : IPv6 Explicit Null
IP lookup           : enabled

Outsegment Info #1 [Head/Push]:
  Outgoing Label: 16008 Outgoing IF: GigabitEthernet0/0/0/5(P) Outgoing Node ID: 0x1
  Nexthop: 192.14.1.44

LSP information (RSVP-TE) :
  Name: tunnel-mte27 Role: Head State: binding
  TUNNEL-ID: 27 P2MP-ID: 27 LSP-ID: 10012
  Source Address: 192.1.1.1 Extended-ID: 192.1.1.1(0xc0010101)

Incoming Label      : (16007)
Transported Protocol : IPv4
Explicit Null       : IPv6 Explicit Null
IP lookup           : enabled
Platform information : FGID: 51075, 51076 frr_slotmask: 0x1

Outsegment Info #1 [Head/Push]:
  Outgoing Label: 16007 Outgoing IF: GigabitEthernet0/0/0/5(P) Outgoing Node ID: 0x1
  Nexthop: 192.14.1.44

```

The following is a sample output from the **show mrib mpls forwarding** command with the detail keyword:

```
RP/0/RSP0/CPU0:router# show mrib mpls forwarding tunnel 27 detail
```

```

LSP information (RSVP-TE) :
  Name: ----- Role: Bud
  TUNNEL-ID: 27 P2MP-ID: 27 LSP-ID: 10002
  Source Address: 192.1.1.1 Extended-ID: 192.1.1.1(0xc0010101)

Incoming Label      : 16001
Transported Protocol : IPv4
Explicit Null       : IPv6 Explicit Null
IP lookup           : enabled
Platform information : FGID: 44045, 44046 frr_slotmask: 0x24

Outsegment Info #1 [Tail/Pop]:
  No info.
Outsegment Info #2 [Mid/Swap]:
  Outgoing Label: 16001 Outgoing IF: GigabitEthernet0/5/0/6(P) Outgoing Node ID:
0x51 Nexthop: 192.168.12.2
Outsegment Info #3 [Mid/Swap]:
  Outgoing Label: 16001 Outgoing IF: GigabitEthernet0/2/0/4(P) Outgoing Node ID:
0x21 Nexthop: 192.168.13.2

```

```
RP/0/RSP0/CPU0:router# show mrib mpls forwarding tunnel 26 detail
```

```

LSP information (RSVP-TE) :
  Name: ----- Role: Tail
  TUNNEL-ID: 26 P2MP-ID: 26 LSP-ID: 10012
  Source Address: 192.1.1.1 Extended-ID: 192.1.1.1(0xc0010101)

Incoming Label      : 16008
Transported Protocol : IPv4
Explicit Null       : IPv6 Explicit Null
IP lookup           : enabled
Platform information : FGID: 51082, 51083 frr_slotmask: 0x0
Outsegment Info #1 [Tail/Pop]:
  No info.

```

show mrib mpls route

To display the Multicast Routing Information Base (MRIB) multicast groups to tunnels mappings, use the **show mrib mpls route** command in EXEC mode.

show mrib mpls route [**interface**] **summary**

Syntax Description	interface	(Optional) Specify the type of interface.
	summary	(Optional) Displays the summary information.

Command Default None

Command Modes EXEC

Command History	Release	Modification
	Release 4.1.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read

Examples This is a sample output from the **show mrib mpls route** command:

```
RP/0/RSP0/CPU0:router# show mrib mpls route
```

```
Tunnel Interface: tunnel-mte28
(192.19.1.9, 239.232.2.1) (192.19.1.9, 239.232.2.2) (192.19.1.9, 239.232.2.3)
Tunnel Interface: tunnel-mte27
(192.19.1.9, 239.232.1.1) (192.19.1.9, 239.232.1.2) (192.19.1.9, 239.232.1.3)
Tunnel Interface: tunnel-mte26
(192.19.1.9, 239.232.0.1) (192.19.1.9, 239.232.0.2) (192.19.1.9, 239.232.0.3)
```

show mrib mpls traffic-eng fast-reroute

To display the Multicast Routing Information Base (MRIB) MPLS traffic engineering fast reroute information, use the **show mrib mpls traffic-eng fast-reroute** command in EXEC mode.

show mrib mpls traffic-eng fast-reroute database {backup-interface| labels| role| state| summary}

Syntax Description

database	Displays the fast reroute database information.
backup-interface	(Optional) Filter based on backup outgoing interface
labels	(Optional) Filter based on incoming label
role	(Optional) Filter based on LSPs with specified role
state	(Optional) Filter based on LSPs with specified FRR (fast-reroute) state
summary	(Optional) Summary of total active and ready FRR states in MRIB

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

This is a sample output from the **show mrib mpls traffic-eng fast-reroute** command:

```
RP/0/RSP0/CPU0:router# show mrib mpls traffic-eng fast-reroute database
```

```
show mrib mpls traffic-eng fast-reroute
```

```

LSP midpoint item frr information:
ExtTunId/TunId/P2MPId/LSPId  In Lbl  Out intf/Lbl  FRR intf/Lbl  Status
-----
192.192.5.3/3001/3001/10002  16513  Te0/5/0/0:17028  tt21:17028  Ready
                                Te0/5/0/5:1048564  tt24:1048564  Ready
192.192.5.3/3002/3002/10002  16514  Te0/5/0/0:17029  tt21:17029  Ready
                                Te0/5/0/5:1048565  tt24:1048565  Ready
192.192.5.3/3003/3003/10002  16515  Te0/5/0/0:17030  tt21:17030  Ready
                                Te0/5/0/5:1048566  tt24:1048566  Ready
192.192.5.3/3004/3004/10002  16516  Te0/5/0/0:17031  tt21:17031  Ready
                                Te0/5/0/5:1048567  tt24:1048567  Ready
192.192.5.3/3005/3005/10002  16517  Te0/5/0/0:17032  tt21:17032  Ready
                                Te0/5/0/5:1048568  tt24:1048568  Ready
192.192.5.3/3006/3006/10002  16518  Te0/5/0/0:17033  tt21:17033  Ready
                                Te0/5/0/5:1048569  tt24:1048569  Ready
192.192.5.3/3007/3007/10002  16519  Te0/5/0/0:17034  tt21:17034  Ready

```

show mrib nsf

To display the state of nonstop forwarding (NSF) operation in the Multicast Routing Information Base (MRIB), use the **show mrib nsf** command in EXEC mode.

show mrib ipv4 nsf

Syntax Description	
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show mrib nsf** command displays the current multicast NSF state for the MRIB. The state may be normal or activated for NSF. The activated state indicates that recovery is in progress due to a failure in MRIB or Protocol Independent Multicast (PIM). The total NSF timeout and time remaining are displayed until NSF expiration.

Task ID	Task ID	Operations
	multicast	read

Examples The following is sample output from the **show mrib nsf** command:

```
RP/0/RSP0/CPU0:router# show mrib nsf

IP MRIB Non-Stop Forwarding Status:
Multicast routing state: Non-Stop Forwarding Activated
NSF Lifetime: 00:03:00
NSF Time Remaining: 00:01:40
This table describes the significant fields shown in the display.
```

Table 26: show mrib nsf Field Descriptions

Field	Description
Multicast routing state	Multicast NSF status of the MRIB (Normal or NSF Activated).
NSF Lifetime	Timeout for MRIB NSF, computed as the maximum of the PIM and Internet Group Management Protocol (IGMP) NSF lifetimes, plus 60 seconds.
NSF Time Remaining	If MRIB NSF state is activated, the time remaining until MRIB reverts to Normal mode displays. Before this timeout, MRIB receives notifications from IGMP and PIM, triggering a successful end of NSF and cause the transition to normal state. If notifications are not received, the timer triggers a transition back to normal mode, causing new routes to download to MFIB and old routes to be deleted.

Related Commands

Command	Description
nsf (multicast) , on page 166	Configures the NSF capability for the multicast routing system.
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value under IGMP .
nsf lifetime (PIM)	Configures the NSF timeout value for the PIM process.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf , on page 227	Displays the state of NSF operation in the MFIB line cards.
show pim nsf	Displays the state of NSF operation for PIM.

show mrib platform trace

To display platform-specific data for the Multicast Routing Information Base (MRIB), use the **show mrib platform trace** command in EXEC mode.

show mrib [**vrf** *vrf-name*] **ipv4** **platform trace** [**file**] **hexdump** [**last**] **reverse** [**stats**] **tailf** [**unique**] **verbose** [**wrapping**] [**location** *all*] *node-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
file	(Optional) Specifies the filename.
hexdump	(Optional) Displays the traces in hexadecimal form.
last	(Optional) Displays the last <i>n</i> entries.
reverse	(Optional) Displays the traces in reverse order.
stats	(Optional) Displays statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries with counts.
verbose	(Optional) Displays internal debugging information.
wrapping	(Optional) Displays wrapping entries.
location <i>node -id</i>	(Optional) Specifies the location of the trace.
location <i>all</i>	(Optional) Specifies that the trace be performed for all locations.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows a sample output of **show mrib platform trace** command:

```
RP/0/RSP0/CPU0:router#show mrib platform trace
2 wrapping entries (512 possible, 0 filtered, 2 total)
```

show mrib route

To display all entries in the Multicast Routing Information Base (MRIB), use the **show mrib route** command in EXEC mode.

show mrib [**vrf** *vrf-name*] [**ipv4**|**ipv6**] [**old-output**] **route** [**summary**|**outgoing-interface**] [*|*source-address*] [*group-address* [/*prefix-length*]] [**detail**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
*	(Optional) Displays shared tree entries.
<i>source-address</i>	(Optional) Source IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> .
<i>group-address</i>	(Optional) Group IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> .
<i>/prefix-length</i>	(Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: <i>A.B.C.D</i> or <i>X:X::X</i> .
outgoing-interface	(Optional) Displays the outgoing-interface information.
summary	(Optional) Displays a summary of the routing database.
detail	(Optional) Displays the routing database with the platform data.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Each line card has an individual Multicast Forwarding Information Base (MFIB) table. The MFIB table maintains a subset of entries and flags updated from MRIB. The flags determine the forwarding and signaling behavior according to a set of forwarding rules for multicast packets. In addition to the list of interfaces and flags, each route entry shows various counters. Byte count is the number of total bytes forwarded. Packet count is the number of packets received for this entry.

The [show mfib counter, on page 176](#) command displays global counters independent of the routes.

Task ID

Task ID	Operations
multicast	read

Related Commands

Command	Description
nsf lifetime (IGMP)	Configures the maximum time for the NSF timeout value on the IGMP.
show mfib counter, on page 176	Displays MFIB counter statistics for packets that have dropped.
show mrib route-collapse, on page 257	Displays the contents of the MRIB route collapse database.
show mfib route, on page 230	Displays all entries in the MFIB table.

show mrib route-collapse

To display the contents of the Multicast Routing Information Base (MRIB) route-collapse database, use the **show mrib route-collapse** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 route-collapse** [*core-tree*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>core-tree</i>	(Optional) IPv4 Multicast Distribution Tree (MDT) group address.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib route-collapse** command:

```
RP/0/RSP0/CPU0:router# show mrib route-collapse
226.1.1.1 TID: 0xe0000038 TLC TID: 0xe0000038
  Customer route database count: 5
    (192.168.5.204,224.0.1.40/32)
    (*,226.226.226.226/32)
    (*,228.228.228.228/32)
    (192.168.113.17,228.228.228.228/32)
    (*,229.229.229.229/32)
  Core route database count: 4
```

show mrib route-collapse

```

(*,226.1.1.1/32)
(192.168.5.201,226.1.1.1/32)
(192.168.5.202,226.1.1.1/32)
(192.168.5.204,226.1.1.1/32)
Core egress node database count: 1
  nodeid      slot      refcount
  0x20        0/2/CPU0    1

192.168.27.1  TID: 0xe0000039  TLC TID: 0xe0000039
Customer route database count: 1
  (192.168.113.33,227.227.227.227/32)
Core route database count: 3
  (*,227.27.27.1/32)
  (192.168.5.201,227.27.27.1/32)
  (192.168.5.202,227.27.27.1/32)
Core egress node database count: 1
  nodeid      slot      refcount
  0x20        0/2/CPU0    1

192.168.28.1  TID: 0xe000003a  TLC TID: 0xe000003a
Customer route database count: 2
  (192.168.5.204,224.0.1.40/32)
  (192.168.113.49,229.229.229.229/32)
Core route database count: 3
  (192.168.5.201,228.28.28.1/32)
  (192.168.5.202,228.28.28.1/32)
  (192.168.5.204,228.28.28.1/32)
Core egress node database count: 1
  nodeid      slot      refcount
  0x20        0/2/CPU0    1

```

Related Commands

Command	Description
show mrib route , on page 255	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib route outgoing-interface

To display the outgoing-interface information on the Multicast Routing Information Base (MRIB), use the **show mrib route outgoing-interface** command in EXEC mode.

show mrib route outgoing-interface [***| *source-address*] [*group-address* [/*prefix-length*]]

Syntax Description

<i>*</i>	(Optional) Displays shared tree entries.
<i>A.B.C.D</i>	(Optional) Source IP address or hostname of the MRIB route. Format is: <i>A.B.C.D</i>
<i>A.B.C.D</i>	(Optional) Group IP address or hostname of the MRIB route and the prefix length.
<i>/prefix-length</i>	(Optional) Prefix length of the MRIB group address. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash must precede the decimal value. Format is: <i>A.B.C.D</i>

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib route outgoing-interface** command:

```
RP/0/RSP0/CPU0:router# show mrib route outgoing-interface

IP Multicast Routing Information Base
Entry flags: L - Domain-Local Source, E - External Source to the Domain,
             C - Directly-Connected Check, S - Signal, IA - Inherit Accept,
             IF - Inherit From, D - Drop, MA - MDT Address, ME - MDT Encap,
             MD - MDT Decap, MT - MDT Threshold Crossed, MH - MDT interface handle
             CD - Conditional Decap, MPLS - MPLS Decap, MF - MPLS Encap, EX - Extranet
             MoFE - MoFRR Enabled, MoFS - MoFRR State

(*,224.0.0.0/4), Up:6d10h, OIF count:0, flags: C
(*,224.0.0.0/24), Up:6d10h, OIF count:0, flags: D
(*,224.0.1.39), Up:6d10h, OIF count:3, flags: S
(10.1.1.1,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.2.2.2,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.3.3.3,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.4.4.4,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.5.5.5,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.6.6.6,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.7.7.7,224.0.1.39), Up:00:04:17, OIF count:11, flags:
(10.8.8.8,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.9.9.9,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.10.10.10,224.0.1.39), Up:6d10h, OIF count:11, flags:
(10.21.21.21,224.0.1.39), Up:6d06h, OIF count:11, flags:
(*,224.0.1.40), Up:6d10h, OIF count:2, flags: S
(10.1.1.1,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.2.2.2,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.6.6.6,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.13.4.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.14.4.4,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.14.8.4,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.21.21.21,224.0.1.40), Up:6d06h, OIF count:11, flags:
(10.23.4.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.23.8.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.34.4.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.34.8.3,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.35.4.3,224.0.1.40), Up:00:02:38, OIF count:11, flags:
(10.35.4.5,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.38.4.8,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.45.4.5,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.49.4.9,224.0.1.40), Up:6d10h, OIF count:11, flags:
(10.105.4.10,224.0.1.40), Up:6d10h, OIF count:11, flags:
(*,225.0.0.0/8), Up:6d06h, OIF count:0, flags: C
(*,226.0.0.0/8), Up:6d06h, OIF count:0, flags: C
(*,232.0.0.0/8), Up:6d10h, OIF count:0, flags: D
(10.6.6.6,232.1.1.1), Up:6d10h, OIF count:3, flags:
(10.7.7.7,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.8.8.8,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.9.9.9,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.10.10.10,232.1.1.1), Up:6d10h, OIF count:2, flags:
(10.21.21.21,232.1.1.1), Up:6d06h, OIF count:3, flags:
```

Related Commands

Command	Description
show mrib route , on page 255	Displays all entries in the Multicast Routing Information Base (MRIB).

show mrib table-info

To display Multicast Routing Information Base (MRIB) table information, use the **show mrib table-info** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 table-info**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib table-info** command:

```
RP/0/RSP0/CPU0:router# show mrib vrf vrf101 table-info

VRF: default [tid 0xe0000000]
Registered Client:
  igmp [ccbid: 0 cltid: 4485366]
  pim [ccbid: 1 cltid: 4485368]
  bcdl_agent [ccbid: 2 cltid: 1]
  msdp [ccbid: 3 cltid: 8827135]
```

Table 27: show mrib table-info Field Descriptions

Field	Description
VRF	Default VRF or a VRF configured for the purpose of an override in MVPN.
cltid	Client ID.
bcdl_agent	A process like igmp and pim, which is used to download routes to line card.
MDT handle	MDT interface handle for this VRF.
MDT group	Default MDT group associated with this VRF.
MDT source	Per-VRF MDT source information.

Related Commands

Command	Description
show mrib tlc, on page 263	Displays the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database.

show mrib tlc

To display the contents of the Multicast Routing Information Base (MRIB) table-line card (TLC) database, use the **show mrib tlc** command in EXEC mode.

show mrib [*vrf vrf-name*] **ipv4 tlc**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show mrib tlc** command:

```
RP/0/RSP0/CPU0:router# show mrib tlc
```

```
VRF: default [tid 0xe0000000]
Master LC slot: Not selected
Associated MDT group: 0
Forwarding LC node: 0
```

This table describes the significant fields shown in the display.

Table 28: show msdp peer Field Descriptions

Field	Description
Associated MDT group	IP address of the MSDP peer.
Master LC slot	Indicates whether the master LC slot has been selected.
Forwarding LC node	Autonomous system to which the peer belongs.
Associated MDT group	Indicates the number of associated MDT groups.

show mrib vrf vrf_name route

To display the detail routing DB with platform data information for multicast routing information base, use the **show mrib vrf vrf_name route** command in the EXEC mode.

show mrib vrf vrf_name route ip_address detail

Syntax Description	detail	Displays routing DB with platform data.
	ip_address	Specifies the group IP address.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read

Examples

```
RP/0/RSP0/CPU0:router# show mrib vrf vrf1 route 232.1.1.1 detail
(192.1.1.2,232.1.1.1) Ver: 0x32b9 RPF nbr: 192.1.1.2 Flags: EID,
PD: Slotmask: 0x0
MGID: 17754
Up: 12:35:50, Route node: 0x504f8df8
RPF-ID: 0, Encap-ID: 4, EPtr: 0x505463c4, Hd: 0x502df6f8, Cts: 1, 0, 0, 0
Acc: 1 (MDT: 0), Fwd: 1 (0), SRD: (0,0), Encap-next: 0x0
Incoming Interface List
GigabitEthernet0/0/0/1.1 Flags: A, Up: 05:30:09, Ptrs: 0x502df438, 0x0
Outgoing Interface List
tunnel-mtel Flags: F NS LI LVIF, Up: 12:35:50, Ptrs: 0x502df6f8, 0x0
LI add redist count: 2
```

static-rpf

To configure a static Reverse Path Forwarding (RPF) rule for a specified prefix mask, use the **static-rpf** command in an appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

static-rpf *prefix-address prefix-mask type path-id next-hop-address*

no static-rpf

Syntax Description

<i>prefix-address</i>	IP address of a prefix for an address range.
<i>prefix-mask</i>	Prefix mask for an address range. Range is 0 to 32 for IPv4 .
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>next-hop-address</i>	IP address for an RPF neighbor.

Command Default

A static RPF rule for a specified prefix mask is not configured.

Command Modes

Multicast routing configuration
Multicast VRF configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **static-rpf** command is used to configure incompatible topologies for unicast and multicast traffic.

Use the **static-rpf** command to configure a static route to be used for RPF checking in Protocol Independent Multicast (PIM) instead of using the unicast routing table.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example configures the static RPF rule for IP address 10.0.0.1:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# vrf green  
RP/0/RSP0/CPU0:router(config-mcast)# static-rpf 10.0.0.1 32 GigE 0/0/5/0 10.1.1.1
```

Related Commands

Command	Description
show pim context	Displays reverse path forwarding (RPF) table information configured for a VRF context.

ttl-threshold (multicast)

To configure the time-to-live (TTL) threshold for packets being forwarded out an interface, use the **ttl-threshold** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

ttl-threshold *ttl*

no ttl-threshold *ttl*

Syntax Description

<i>ttl</i>	Time to live value. Range is 1 to 255.

Command Default

ttl : 0

Command Modes

Multicast routing interface configuration
Multicast routing VRF interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Only multicast packets with a TTL value greater than the threshold are forwarded out of the interface. The TTL threshold is compared to the TTL of the packet after it has been decremented by one and before being forwarded.

Configure the TTL threshold only on border routers.



Note

Do not confuse this command with the **ttl-threshold (MSDP)** command in router MSDP configuration mode that is used to confine the multicast data packet TTL to be sent by an Multicast Source Discovery Protocol (MSDP) Source-Active (SA) message.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the TTL threshold to 23, which means that a multicast packet is dropped and not forwarded out of the GigE 0/1/0/0 interface:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# interface GigE 0/1/0/CPU0  
RP/0/RSP0/CPU0:router(config-mcast-default-ipv4-if)# ttl-threshold 23
```

Related Commands

Command	Description
ttl-threshold (MSDP)	Limits which multicast data packets are sent in SA messages to an MSDP peer.

vrf (multicast)

To configure a virtual routing and forwarding (VRF) instance for a VPN table, use the **vrf** command in multicast routing configuration mode. To remove the VRF instance from the configuration file and restore the system to its default condition, use the **no** form of this command.

vrf *vrf-name* **ipv4**

no vrf *vrf-name* **ipv4**

Syntax Description

<i>vrf-name</i>	Name of the VRF instance. The following names cannot be used: all, default, and global.
ipv4	(Optional) Configures IPv4 address prefixes.

Command Default

No default behavior or values.

Command Modes

Multicast routing configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A VRF instance is a collection of VPN routing and forwarding tables maintained at the provider edge (PE) router.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure a VRF instance and enter VRF configuration mode:

```
RP/0/RSP0/CPU0:router(config)# multicast-routing
RP/0/RSP0/CPU0:router(config-mcast)# vrf vrf_1
RP/0/RSP0/CPU0:router(config-mcast-vrf_1-ipv4)# mdt ?
```

data Data MDT group configuration
 default MDT default group address
 mtu MDT mtu configuration
 source Interface used to set MDT source address

Related Commands

Command	Description
boundary, on page 127	Configures a boundary to keep multicast packets from being forwarded.
accounting per-prefix, on page 116	Enables per-prefix counters only in hardware.
interface (multicast), on page 143	Configures multicast interface properties.
log-traps, on page 149	Enables logging of trap events.
multipath, on page 163	Enables Protocol Independent Multicast (PIM) to divide the multicast load among several equal-cost paths.
rate-per-route, on page 170	Enables individual (source, group [S, G]) rate calculations.
ssm	Defines the Protocol Independent Multicast (PIM)-Source Specific Multicast (SSM) range of IP multicast addresses.
static-rpf, on page 266	Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.



IGMP Snooping Commands on Cisco ASR 9000 Series Routers

This chapter describes the commands used to configure and monitor IGMP snooping on Cisco ASR 9000 Series Router.

For detailed information about IGMP snooping concepts, configuration tasks, and examples, refer to the *Implementing Layer 2 Multicast Using IGMP Snooping on Cisco ASR 9000 Series Routers* module in the *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide*.

- [access-group \(IGMP snooping profile\), page 275](#)
- [clear igmp snooping bridge-domain, page 277](#)
- [clear igmp snooping group, page 279](#)
- [clear igmp snooping port, page 281](#)
- [clear igmp snooping summary, page 283](#)
- [clear l2vpn forwarding bridge-domain mroute, page 285](#)
- [group limit, page 287](#)
- [group policy, page 289](#)
- [igmp snooping profile, page 291](#)
- [immediate-leave, page 294](#)
- [internal-querier, page 296](#)
- [internal-querier max-response-time, page 299](#)
- [internal-querier query-interval, page 301](#)
- [internal-querier robustness-variable, page 303](#)
- [internal-querier tcn query count, page 305](#)
- [internal-querier tcn query interval, page 307](#)
- [internal-querier timer expiry , page 309](#)
- [internal-querier version, page 311](#)

- [last-member-query count, page 313](#)
- [last-member-query interval, page 315](#)
- [minimum-version, page 317](#)
- [mrouter, page 319](#)
- [querier query-interval, page 321](#)
- [querier robustness-variable, page 323](#)
- [redundancy iccp-group report-standby-state disable, page 325](#)
- [report-suppression disable, page 327](#)
- [router-alert-check disable, page 329](#)
- [router-guard, page 331](#)
- [show igmp snooping bridge-domain, page 333](#)
- [show igmp snooping group, page 340](#)
- [show igmp snooping port, page 347](#)
- [show igmp snooping profile, page 353](#)
- [show igmp snooping redundancy, page 358](#)
- [show igmp snooping summary, page 360](#)
- [show igmp snooping trace, page 365](#)
- [show l2vpn forwarding bridge-domain mroute, page 367](#)
- [startup query count, page 369](#)
- [startup query iccp-group, page 370](#)
- [startup query interval, page 372](#)
- [startup query max-response-time, page 373](#)
- [startup query port-up disable, page 375](#)
- [startup query process start, page 377](#)
- [startup query topology-change, page 379](#)
- [static group, page 381](#)
- [system-ip-address, page 383](#)
- [tcn flood disable, page 385](#)
- [tcn flood query count, page 387](#)
- [tcn query solicit, page 389](#)
- [ttl-check disable, page 391](#)
- [unsolicited-report-interval, page 393](#)

access-group (IGMP snooping profile)

To instruct IGMP snooping to apply the specified access list filter to received membership reports, use the **access-group** command in IGMP snooping profile configuration mode. To discontinue membership report filtering, use the **no** form of this command.

access-group *acl-name*

no access-group

Syntax Description

<i>acl-name</i>	Name of the ACL filter.

Command Default

Membership reports are not filtered by default.

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples shows how to configure an ACL to filter membership reports:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# access-group acl-name
```

Related Commands

Command	Description
group limit , on page 287	Specifies the group limit of the port.

Command	Description
group policy , on page 289	Instructs IGMP snooping to use the specified route policy to determine the weight contributed by a new <*,G> or <S,G> membership request.
show igmp snooping profile , on page 353	Displays the contents of profiles and to see associations of profiles with bridge-domains and ports, including access group, group limit, and TCN flood parameters.

clear igmp snooping bridge-domain

To clear IGMP snooping information at the bridge domain level, use the **clear igmp snooping bridge-domain** command in EXEC mode.

clear igmp snooping bridge-domain [*bridge-domain-name*] **statistics** [**include-ports**]

Syntax Description

bridge-domain-name	(Optional) Clears information for the named bridge domain.
statistics	Clears counters and other statistics. In Release 3.7.2, this is the only keyword available and it is required.
include-ports	(Optional) Clears port-level counters and statistics in addition to the bridge domain level.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	This command was modified to clear new statistical information added in the current release to support multicast admission control.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In Release 3.7.2, the only items available for clearing are counters and statistics. You have the option to clear statistics for one or all bridge domains. You also have the option to clear only bridge domain statistics, or bridge domain statistics plus all statistics for all ports under the cleared bridge domains.

Task ID

Task ID	Operations
l2vpn	execute

Examples

The following example clears IGMP snooping statistics for all bridge domains on the router:

```
RP/0/RSP0/CPU0:router# clear igmp snooping bridge-domain statistics
```

The following example clears IGMP snooping statistics for one bridge domain and all ports under it:

```
RP/0/RSP0/CPU0:router# clear igmp snooping bridge-domain bd-1 statistics include-ports
```

Related Commands

Command	Description
show igmp snooping bridge-domain, on page 333	Displays IGMP snooping configuration information and statistics for bridge domains.

clear igmp snooping group

To clear IGMP snooping group states, use the **clear igmp snooping group** command in EXEC mode.

clear igmp snooping group [*group-address*] [**port** {**interface-name**| **neighbor** *ipaddr* **pw-id** *id*}| **bridge-domain** *bridge-domain*]

Syntax Description

<i>group-address</i>	(Optional) Clears the specified group from the forwarding tables.
port <i>interface-name</i>	(Optional) Clears groups for the named interface from the forwarding tables.
port neighbor <i>ipaddr</i> pw-id <i>id</i>	(Optional) Clears groups for the named pseudowire (PW) from the forwarding tables.
bridge-domain <i>bridge-domain</i>	(Optional) Clears groups for the named bridge domain from the forwarding tables.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

IGMP snooping propagates the request to clear group information through the L2FIB to the forwarding plane. After this command is issued, IGMP snooping relearns group information by snooping packets as they are received from the network.

Use the **address** keyword to clear one group, identified by address. Otherwise, all groups are cleared. You can clear the named group from all ports or bridges, or from a specifically identified port or bridge.

Use the **bridge-domain** keyword to clear groups only for a named bridge domain. Use the **port** keyword to clear groups for a named port. A port can be an access interface or a pseudowire. The **bridge-domain** and **port** keywords are mutually exclusive.

Task ID

Task ID	Operations
l2vpn	execute

Examples

The following example clears all group membership information from the forwarding tables:

```
RP/0/RSP0/CPU0:router# clear igmp snooping group
```

The following example clears one group from the forwarding table for one identified access circuit:

```
RP/0/RSP0/CPU0:router# clear igmp snooping group port
GigabitEthernet
0/1/1/1
```

The following example clears all group membership information from the forwarding table for one identified pseudowire:

```
RP/0/RSP0/CPU0:router# clear igmp snooping group port
neighbor
10.5.5.5 pw-id 5
```

The following example clears one group from the forwarding table for one identified pseudowire:

```
RP/0/RSP0/CPU0:router# clear igmp snooping group 10.10.10.1 port
neighbor
10.5.5.5 pw-id 5
```

Related Commands

Command	Description
show igmp snooping group , on page 340	Displays IGMP snooping configuration information and statistics by group address.

clear igmp snooping port

To clear IGMP snooping port information, use the **clear igmp snooping port** command in EXEC mode.

clear igmp snooping port [**interface-name**| **neighbor** *ipaddr* **pw-id** *id*] **bridge-domain** *bridge-domain-name*] **statistics**

Syntax Description

interface-name	(Optional) Clears information for the named interface from the forwarding tables.
neighbor <i>ipaddr</i> pw-id <i>id</i>	(Optional) Clears information for the named PW from the forwarding tables.
bridge-domain <i>bridge-domain-name</i>	(Optional) Clears information for all ports under the named bridge domain.
statistics	Clears counters and other statistics. In Release 3.7.2, this keyword is required.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	This command was modified to clear new statistical information added in the current release to support multicast admission control.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can use this command to clear IGMP snooping information at the port level for:

- All ports on the router
- A specific port, using its interface name
- A specific PW, using the **neighbor** keyword

- All ports under a named bridge domain, using the **bridge-domain** keyword. In this case, only the port-level information is cleared under the bridge-domain. Use the **clear igmp snooping bridge-domain** command to clear statistics at the bridge-domain level.

Task ID

Task ID	Operations
l2vpn	execute

Examples

The following example clears IGMP snooping port-level counters for all ports on the router.

```
RP/0/RSP0/CPU0:router# clear igmp snooping port statistics
```

The following example clears IGMP snooping counters for one AC.

```
RP/0/RSP0/CPU0:router# clear igmp snooping port GigabitEthernet 0/1/1/1 statistics
```

The following example clears IGMP snooping counters for one PW.

```
RP/0/RSP0/CPU0:router# clear igmp snooping port neighbor 10.5.5.5 pw-id 5 statistics
```

Related Commands

Command	Description
clear igmp snooping bridge-domain, on page 277	Clears IGMP snooping information at the bridge level.
show igmp snooping port, on page 347	Displays IGMP snooping configuration information and statistics by port.

clear igmp snooping summary

To clear IGMP snooping summary counters, use the **clear igmp snooping summary** command in EXEC mode.

clear igmp snooping summary statistics

Syntax Description

statistics	Clears counters and other statistics. In Release 3.7.2, this is the only keyword available and it is required.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	This command was modified to clear new statistical information added in the current release to support multicast admission control.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command clears summary level statistics about IGMP snooping. This command does not affect statistics at the bridge domain level or the port level.

Task ID

Task ID	Operations
l2vpn	execute

Examples

The following example clears all IGMP snooping statistics.

```
RP/0/RSP0/CPU0:router# clear igmp snooping summary statistics
```

 clear igmp snooping summary**Related Commands**

Command	Description
show igmp snooping summary, on page 360	Displays IGMP snooping configuration and traffic statistics at a summary level for the router.

clear l2vpn forwarding bridge-domain mroute

To clear multicast routes from the Layer-2 forwarding tables, use the **clear l2vpn forwarding bridge-domain mroute** command in EXEC mode.

clear l2vpn forwarding bridge-domain [*bg:bd*] **mroute** [*ipv4| ipv6*] [*location node-id*]

Syntax Description

[<i>bg:bd</i>]	(Optional) Clears Layer-2 multicast routes only for the specified bridge group and bridge domain.
ipv4	(Optional) Specifies the IPv4 addressing scheme.
location <i>node-id</i>	(Optional) Clears Layer-2 multicast routes only for the specified node ID.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command removes multicast routes in the Layer-2 forwarding information base (l2fib) tables. If you issue the command without a specific bridge group and bridge domain, information for all bridge groups and domains is cleared.



Note

This command does not remove the state from the control plane. So, multicast routes will not be recreated. You can use the **clear igmp snooping group** command which not only clears state from the control plane but also clears the state from the forwarding plane.

Task ID

Task ID	Operations
l2vpn	execute

Examples

The following example clears all multicast routes across all bridge domains on one module.

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding mroute location 0/5/CPU0
```

group limit

To specify the maximum number of groups or source-groups that may be joined on a port, use the **group limit** command in IGMP snooping profile configuration mode. By default, each group or source-group contributes a weight of 1 towards this limit. To remove the group limit, use the **no** form of this command.

group limit *group-limit-value*

no group limit *group-limit-value*

Syntax Description

group-limit-value	Limit value for the port. Range is from 0-65535.

Command Default

No group limit

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

No new group or source group will be accepted if its contributed weight would cause this limit to be exceeded.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to set the group limit of a port for weighting:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# igmp snooping profile
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# group limit 699
```

Related Commands

Command	Description
access-group (IGMP snooping profile), on page 275	Instructs IGMP snooping to apply the specified access list filter to received membership reports
group policy, on page 289	Instructs IGMP snooping to use the specified route policy to determine the weight contributed by a new <*,G> or <S,G> membership request.
show igmp snooping profile, on page 353	Displays the contents of profiles and to see associations of profiles with bridge-domains and ports, including access group, group limit, and TCN flood parameters.
show igmp snooping group, on page 340	Displays a summary of IGMP group information by group.
show igmp snooping group detail	Displays detailed IGMP group information in a multiline display per group.
show igmp snooping port, on page 347	Displays IGMP snooping configuration information and traffic counters by router interface port.
show igmp snooping port detail	Displays IGMP snooping configuration information and traffic counters by router interface port. You can use this command to see groups admitted against the configured limit.
show igmp snooping port group detail	Displays detailed IGMP membership information by port. You can use this command to see how group limits are assigned to groups on a port.

group policy

To instruct IGMP snooping to use the specified route policy to determine the weight contributed by a new <*,G> or <S,G> membership request, use the **group policy** command in IGMP snooping profile configuration mode. To remove the group weight route policy from the profile and use the default group weight of 1 for all groups, use the **no** form of this command.

group policy *policy-name*

no group policy

Syntax Description

<i>policy-name</i>	Name of the route policy that should determine the weight contributed by a new <*,G> or <S,G> membership request.

Command Default

Default weight for all groups is 1. By default, no route policy is configured to determine the weight of new <*,G> or <S,G> membership requests.

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To limit the number of IGMP v2/v3 groups, in which the maximum number of concurrently allowed multicast channels must be configurable on a per EFP-basis and per PW-basis, configure group weighting.

IGMP snooping limits the membership on a bridge port to a configured maximum limit. This feature also supports IGMPv3 source groups and allows different weights to be assigned to individual groups or source groups. This enables the IPTV provider, for example, to associate standard and high- definition IPTV streams, as appropriate, to specific subscribers.

This feature does not limit the actual multicast bandwidth that may be transmitted on a port. Rather, it limits the number of IGMP groups and source-groups, of which a port can be a member. It is the responsibility of the IPTV operator to configure subscriber membership requests to the appropriate multicast flows.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure a group route policy for weighting new <*,G> or <S,G>membership requests:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)#igmp snooping profile
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# group policy
policy name
```

Related Commands

Command	Description
access-group (IGMP snooping profile), on page 275	Instructs IGMP snooping to apply the specified access list filter to received membership reports
group limit, on page 287	Specifies the group limit of a port for weighting purposes.
show run route-policy	Displays the route policy information.

igmp snooping profile

To create or change an IGMP snooping profile, or to attach an IGMP snooping profile to a bridge or a port, use the **igmp snooping profile** command in the appropriate configuration mode. To detach a profile from a bridge domain or port, use the **no** form of this command. To delete a profile from the database, use the **no** form of this command in global configuration mode.

igmp snooping profile *profile-name*

no igmp snooping

Syntax Description

<i>profile-name</i>	Name that uniquely identifies the IGMP snooping profile.

Command Default

IGMP snooping is inactive on a bridge domain until a profile is attached to the bridge domain.

Command Modes

Global configuration

L2 VPN bridge group bridge domain configuration

L2 VPN bridge group bridge domain interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command accomplishes different tasks depending on the configuration mode you are in when you issue it.

- In global configuration mode, this command creates and changes profiles.
- In L2 VPN bridge group bridge domain configuration mode, this command attaches profiles to bridge domains.
- In L2 VPN bridge group bridge domain interface configuration mode, this command attaches profiles to ports.

Use the **igmp snooping profile** command in global configuration mode to create a new IGMP snooping profile or to change an existing profile. The command enters you into IGMP snooping profile configuration mode, from which you can issue commands that configure IGMP snooping.

The minimum configuration is an empty profile. An empty profile enables IGMP snooping with a default configuration.

To enable IGMP snooping on a bridge domain, you must attach a profile to the bridge domain. To disable IGMP snooping on a bridge domain, detach the profile from the bridge domain.

To attach a profile to a bridge domain, use the **igmp snooping profile** command in Layer-2 VPN bridge group bridge domain configuration mode. At the bridge domain level, only one IGMP snooping profile can be attached to a bridge.

If a profile attached to a bridge domain contains port-specific configuration options, the values apply to all of the ports under the bridge, unless a port-specific profile is attached to one of the ports. In that case, the port with the attached profile is configured using only the commands in the port profile, and any port configurations in the bridge profile are ignored.

Optionally, profiles can be attached to specific ports under a bridge domain. To attach a profile to a port, use the **igmp snooping profile** command in Layer-2 VPN bridge group bridge domain interface configuration mode. Each port can have only one port-specific profile attached to it.

IGMP snooping must be enabled on the bridge domain for any port-specific configurations to take effect. When a profile is attached to a port, IGMP snooping reconfigures that port, disregarding any port configurations that may exist in the bridge-level profile.

To detach a profile from a bridge domain, use the **no** form of this command in Layer-2 VPN bridge group bridge domain configuration mode. To detach a profile from a port, use the **no** form of this command in the interface configuration mode under the bridge domain.

When you detach a profile from a bridge domain or a port, the profile still exists and is available for use at a later time.

Detaching a profile has the following results:

- If you detach a profile from a bridge domain, IGMP snooping is deactivated in the bridge domain.
- If you detach a profile from a port, IGMP snooping configuration values for the port are instantiated from the bridge domain profile.

An active profile is one that is currently attached.

If you need to change an active profile, you must detach it from all bridges or ports, change it, and reattach it. An alternate procedure is to create a new profile incorporating the desired changes, detach the existing one, and immediately attach the new one.

To access an existing profile, use the **igmp snooping profile** command with the existing *profile-name* in global configuration mode. The command enters you into IGMP snooping profile configuration mode, from which you can issue commands to add to the current configuration or enter the **no** form of existing commands to delete them from the configuration.

To delete a profile from the router database, use the **no** form of this command in global configuration mode.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to create a new IGMP snooping profile or edit an existing profile:

```
router(config)# igmp snooping profile Profile-1  
router(config-igmp-snooping-profile)#
```

The following example attaches a profile to the bridge domain ISP1:

```
RP/0/RSP0/CPU0:router(config)# l2vpn  
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group GRP1  
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain ISP1  
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# igmp snooping profile profile-1
```

The following example attaches a profile to the GigabitEthernet 0/1/1/1 port:

```
RP/0/RSP0/CPU0:router(config)# l2vpn  
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group GRP1  
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain ISP1  
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# interface GigabitEthernet 0/1/1/1  
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-if)# igmp snooping profile mrouter-port-profile  
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-if)# commit
```

immediate-leave

To configure fast leave processing on a port for IGMPv2 queriers, use the **immediate-leave** command in IGMP snooping profile configuration mode. To remove the functionality, use the **no** form of this command.

immediate-leave

no immediate-leave

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes IGMP snooping profile configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Immediate leave is an optional port-level configuration parameter. Immediate leave processing causes IGMP snooping to remove a Layer-2 interface from the forwarding table entry immediately, without first sending IGMP group-specific queries to the interface. Upon receiving an IGMP leave message, IGMP snooping immediately removes the interface from the Layer-2 forwarding table entry for that multicast group, unless a multicast router was learned on the port.

Immediate leave processing improves leave latency but is appropriate only when one receiver is configured on a port. For example, immediate leave is appropriate in the following situations:

- Point-to-point configurations, such as an IPTV channel receiver.
- Downstream DSLAMs with proxy reporting.



Caution

Do not use immediate leave on a port when the possibility exists for more than one receiver per port. Doing so could prevent an interested receiver from receiving traffic. For example, immediate leave is not appropriate in a LAN.

Immediate leave processing is a port-level option. You can configure this option explicitly per port in port profiles or in the bridge domain profile, in which case it applies to all ports under the bridge.

**Note**

Immediate leave (or fast-leave) processing for IGMPv3 is not supported. All IGMPv3 traffic is processed using the default last member query method.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add immediate leave to a profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile) # immediate-leave
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

internal-querier

To configure an internal IGMP querier on a bridge domain, use the **internal-querier** command in IGMP snooping profile configuration mode. To disable the internal querier, use the **no** form of this command.

internal-querier

no internal-querier

Syntax Description This command has no arguments or keywords.

Command Default The internal querier is disabled by default.

Command Modes IGMP snooping profile configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to configure an IGMP querier in a bridge domain where no external querier exists. An internal querier injects query packets into the bridge domain.

In a network where IP multicast routing is configured, the IP multicast router acts as the IGMP querier. In situations when no mrouter port exists in the bridge domain (because the multicast traffic does not need to be routed), but local multicast sources exist, you must configure an internal querier to implement IGMP snooping. The internal querier solicits membership reports from hosts in the bridge domain so that IGMP snooping can build constrained multicast forwarding tables for the multicast traffic within the bridge domain.

An internal querier might also be useful when there are interoperability issues that prevent IGMP snooping from working correctly with an external querier. In this case, you can:

- 1 Prevent the uncooperative external querier from being discovered by placing the **router-guard** command on that port.
- 2 Configure an internal querier to learn group membership interests from the ports in the bridge domain.
- 3 Configure static mrouter ports to receive multicast traffic.

The minimum configuration for an internal querier is as follows. Both of the following commands are required.

- Add the **internal-querier** command to a profile attached to the bridge domain. This command configures the internal querier with the default configuration.

- Add the **system-ip-address** command to a profile attached to the bridge domain to configure an address other than the default 0.0.0.0.

You can disable the internal querier (using the **no** form of the **internal-querier** command) without removing any other internal querier commands. The additional internal querier commands are ignored in that case.

The scope for the **internal-querier** command is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

The local IGMP snooping process responds to the internal querier's general queries. In particular, the IGMPv3 proxy (if enabled) generates a current-state report and forwards it to all mrouter. For IGMPv2 or when the IGMPv3 proxy is disabled, IGMP snooping generates current-state reports for static group state only.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example activates an internal querier with default configuration values:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile) # system-ip-address 10.1.1.1
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile) # internal-querier
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier max-response-time, on page 299	Configures the maximum response time advertised by the internal querier.
internal-querier query-interval, on page 301	Configures the time between general queries issued by the internal querier.
internal-querier robustness-variable, on page 303	Configures the robustness variable for the internal querier.
internal-querier tcn query count, on page 305	Configures the number of queries the internal querier sends after receiving a group leave from IGMP snooping.
internal-querier tcn query interval, on page 307	Configures the time between queries that the internal querier sends after receiving a group leave from IGMP snooping.
internal-querier timer expiry , on page 309	Configure the time IGMP snooping waits to receive messages from an external querier before making the internal querier the active querier

Command	Description
internal-querier version, on page 311	Configures the IGMP version that the internal querier runs,.
mrouter, on page 319	Sets a port to receive query packets.
router-guard, on page 331	Sets a port to block query packets.
system-ip-address, on page 383	Configures an IP address for IGMP snooping use.

internal-querier max-response-time

To configure the maximum response time advertised by the internal querier, use the **internal-querier max-response-time** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier max-response-time *seconds*

no internal-querier max-response-time

Syntax Description

<i>seconds</i>	Configures the maximum response time included in queries from the internal querier. Valid values are from 1 to 25 (seconds).

Command Default

10 (seconds)

Command Modes

IGMP snooping profile configuration (config-igmp-snooping-profile)

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

The maximum response time (MRT) is the amount of time during which receivers are required to report their membership state.

In addition, the maximum response time is used in the calculation of the Group Management Interval (GMI). GMI controls when IGMP snooping expires stale group membership states. See the “Implementing IGMP Snooping on Cisco ASR 9000 Series Router” module in the *Cisco ASR 9000 Series Routers Multicast Configuration Guide* for more information about the GMI.

The maximum response time is advertised in general queries issued by the internal querier.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures a maximum response time for the internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier max-response-time 5
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.

internal-querier query-interval

To configure the time between general queries issued by the internal querier, use the **internal-querier query-interval** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier query-interval *seconds*

no internal-querier query-interval

Syntax Description

<i>seconds</i>	Configures the number of seconds between general queries for membership reports issued by the internal querier. Valid values are from 1 to 18000 (seconds).

Command Default

60 (seconds). This is a nonstandard default value.

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the internal querier is the active querier in the domain, it solicits membership reports by sending IGMP general queries at the interval specified by this command on every active port in the bridge domain.



Note

Cisco IOS and Cisco IOS XR software use the non-standard default value of 60 for query interval.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example sets a query interval for the internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier query-interval 125
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.

internal-querier robustness-variable

To configure the robustness variable for the internal querier, use the **internal-querier robustness-variable** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier robustness-variable *number*

no internal-querier robustness-variable

Syntax Description	<i>number</i>	Valid values are from 1 to 7.

Command Default	2

Command Modes	IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to set the internal querier's robustness variable to a value other than the default configuration value. If the internal querier is running IGMPv3, it advertises the robustness variable in its general queries.

In addition, the robustness variable is used in the calculation of the Group Management Interval (GMI). GMI controls when IGMP snooping expires stale group membership states. See the "Implementing IGMP Snooping on Cisco ASR 9000 Series Routers" module in the *Cisco ASR 9000 Series Routers Multicast Configuration Guide* for more information about GMI.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example configures the robustness variable for an internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier robustness-variable  
3
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.

internal-querier tcn query count

To configure the number of queries the internal querier sends after receiving a group leave from IGMP snooping, use the **internal-querier tcn query count** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier tcn query count *number*

no internal-querier tcn query count

Syntax Description

<i>number</i>	Configures the number of queries the internal querier sends after receiving a group leave from IGMP snooping. Valid values are from 0 to 3. The time between queries is controlled by the internal-querier tcn query interval command.

Command Default

2

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

IGMP snooping reacts to Spanning Tree Protocol (STP) topology change notifications (TCNs) by flooding all multicast traffic and sending group leaves to expedite relearning. When the internal querier receives a group leave, it sends queries to solicit membership reports. This command configures the number of queries to send. The time between queries is controlled by the **internal-querier tcn query interval** command.

If you set **internal-querier tcn query count** to 0, the internal querier does not respond to group leaves.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures the tcn query count for an internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier tcn query count 3
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.
internal-querier tcn query interval, on page 307	Configures the interval between queries the internal querier sends after receiving a group leave from IGMP snooping.

internal-querier tcn query interval

To configure the time between queries that the internal querier sends after receiving a group leave from IGMP snooping, use the **internal-querier tcn query interval** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier tcn query interval *seconds*

no internal-querier tcn query interval

Syntax Description	<i>seconds</i>	Configures the time between queries. Valid values are from 1 to 18000.

Command Default	10

Command Modes	IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

IGMP snooping reacts to STP topology change notifications by flooding all multicast traffic and sending group leaves to expedite relearning. When the internal querier receives the group leave, it sends queries to solicit membership reports. This command configures the time between queries.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example configures the tcn query interval for an internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier tcn query interval  
100
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.
internal-querier tcn query count, on page 305	Configures the number of queries the internal querier sends after receiving a group leave from IGMP snooping.

internal-querier timer expiry

To configure the time IGMP snooping waits to receive messages from an external querier before making the internal querier the active querier, use the **internal-querier timer expiry** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier timer expiry *seconds*

no internal-querier timer expiry

Syntax Description

<i>seconds</i>	The time IGMP snooping waits to receive messages from an external querier before making the internal querier the active querier. Valid values are from 60 to 300 (seconds).

Command Default

125 (seconds), as defined in RFC-3376, Section 8.5:

$(robustness-variable * query-interval) + \frac{1}{2}(max-response-time)$

Using the default values for all components:

$(2 * 60) + \frac{1}{2}(10) = 125$

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A bridge domain can have only one active querier at a time. If the internal querier receives queries from another querier in a bridge domain, it performs querier election. The lowest IP address wins. If the internal querier is the election loser, IGMP snooping sets a timer to the **internal-querier timer expiry** value. If this timer expires before another query is received from the election winner, the internal querier becomes the active querier.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures the timer expiry value for an internal querier, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier timer expiry 100
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.

internal-querier version

To configure the IGMP version of the internal querier, use the **internal-querier version** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

internal-querier version *version*

no internal-querier version

Syntax Description

version	Controls whether the internal querier sends IGMPv2 or IGMPv3 queries. Valid values are 2 or 3, representing IGMPv2 or IGMPv3.

Command Default

3

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The internal querier sends IGMP queries on the bridge domain. This command sets the internal querier to run as either an IGMPv2 or IGMPv3 querier.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures the internal querier to send IGMPv2 queries, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# internal-querier version 2
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Enables an internal querier in the bridge domain.

last-member-query count

To configure the number of group-specific queries IGMP snooping sends in response to a leave message, use the **last-member-query count** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

last-member-query count *number*

no last-member-query count

Syntax Description

<i>number</i>	Specifies the number of queries IGMP snooping sends in response to a leave message. Valid values are from 1 to 7.

Command Default

2

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Last member query is the default group leave processing method used by IGMP snooping. With last member query processing, IGMP snooping processes leave messages as follows:

- IGMP snooping sends group-specific queries on the port that receives the leave message to determine if any other devices connected to that interface are interested in traffic for the specified multicast group. Using the following two configuration commands, you can control the latency between the request for a leave and the actual leave:
 - **last-member-query-count** command—Controls the number of group-specific queries IGMP snooping sends in response to a leave message.
 - **last-member-query-interval** command—Controls the amount of time between group-specific queries.
- If IGMP snooping does not receive an IGMP Join message in response to group-specific queries, it assumes that no other devices connected to the port are interested in receiving traffic for this multicast group, and it removes the port from its Layer-2 forwarding table entry for that multicast group.

- If the leave message was from the only remaining port, IGMP snooping removes the group entry and generates an IGMP leave to the multicast routers.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures the number of queries that IGMP snooping sends in response to a leave, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# last-member-query count 1
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
last-member-query interval, on page 315	Configures the time between queries sent in response to an IGMP leave.

last-member-query interval

To configure the amount of time between group-specific queries, use the **last-member-query interval** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

last-member-query interval *milliseconds*

no last-member-query interval

Syntax Description

<i>milliseconds</i>	Specifies the time between queries that IGMP snooping sends in response to a leave message. Valid values are from 100 to 5000 (milliseconds).

Command Default

1000 (milliseconds)

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Last member query is the default group leave processing method used by IGMP snooping. With last member query processing, IGMP snooping processes leave messages as follows:

- IGMP snooping sends group-specific queries on the port that receives the leave message to determine if any other devices connected to that interface are interested in traffic for the specified multicast group. Using the following two configuration commands, you can control the latency between the request for a leave and the actual leave:
 - **last-member-query-count** command—Controls the number of group-specific queries IGMP snooping sends in response to a leave message.
 - **last-member-query-interval** command—Controls the amount of time between group-specific queries.
- If IGMP snooping does not receive an IGMP Join message in response to group-specific queries, it assumes that no other devices connected to the port are interested in receiving traffic for this multicast group, and it removes the port from its Layer-2 forwarding table entry for that multicast group.

- If the leave message was from the only remaining port, IGMP snooping removes the group entry and generates an IGMP leave to the multicast routers.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures the interval between queries that IGMP snooping sends in response to a leave, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# last-member-query interval 2000
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
last-member-query count, on page 313	Configures the number of queries sent in response to an IGMP leave.

minimum-version

To change the IGMP versions supported by IGMP snooping, use the **minimum-version** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

minimum-version *number*

no minimum-version

Syntax Description

<i>number</i>	Specifies the minimum IGMP version supported by IGMP snooping. Supported values are: • 2—Snoops messages from IGMPv2 and IGMPv3. • 3—Only IGMPv3 messages are snooped. All IGMPv2 messages are ignored by IGMP snooping.

Command Default

2 (supporting IGMPv2 and IGMPv3)

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **minimum-version** command controls which IGMP versions are supported by IGMP snooping in the bridge domain.

- When **minimum-version** is 2, IGMP snooping intercepts IGMPv2 and IGMPv3 messages. This is the default value.
- When **minimum-version** is 3, IGMP snooping intercepts only IGMPv3 messages and drops all IGMPv2 messages.

The scope for this configuration option is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example configures IGMP snooping to support only IGMPv3 and to ignore IGMPv2 reports and queries:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# minimum-version 3
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

mrouter

To statically configure a port to receive query packets, use the **mrouter** command in IGMP snooping profile configuration mode. To remove the configuration, use the **no** form of this command.

mrouter

no mrouter

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can statically configure a port as an mrouter port with the **mrouter** command.

You can use the **router-guard** and the **mrouter** commands on the same port to configure a guarded port as a static mrouter. For example:

- In situations where there are a large number of downstream host ports, you may want to block dynamic mrouter discovery and configure static mrouters. In this case, configure the router guard feature at the domain level. By default, it will be applied to all ports, including the (typically) large number of downstream host ports. Then use another profile without router guard configured for the relatively few upstream ports on which you want to permit dynamic mrouter discovery or configure static mrouters.
- In situations when incompatibilities with non-Cisco equipment prevents correct dynamic discovery, you can disable all attempts for dynamic discovery using the router guard feature, and statically configure the mrouter.
If you are using the router guard feature because there is an incompatible IGMP router on the port, you should also configure the **mrouter** command on the port to ensure that the router receives IGMP reports and multicast flows.

The scope of this command is port level. If you use this command in a profile attached to a bridge domain, you are configuring all ports as mrouter ports.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add static mrouter configuration to a profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# mrouter
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Sets a port to send query packets to bridge domain ports.
router-guard, on page 331	Blocks query packets on the port.

querier query-interval

To configure the query interval for processing IGMPv2 membership states, use the **querier query-interval** command in IGMP snooping profile configuration mode. To return to the default setting, use the **no** form of this command.

querier query-interval *seconds*

no querier query-interval

Syntax Description

<i>seconds</i>	Specifies the integer to use as the query interval in calculations performed by IGMP snooping when processing IGMPv2 messages.
Note	IGMPv3 messages convey the query interval from the querier.
	Valid values are integers from 1 to 18000 (seconds). The default is 60.

Command Default

60 (seconds). This is a nonstandard default value.

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Query interval is the interval between general queries and is used in the calculated group management interval (GMI). GMI controls when IGMP snooping expires stale group membership states. For more information about GMI, see the “Implementing IGMP Snooping on Cisco ASR 9000 Series Routers” module in the *Cisco ASR 9000 Series Routers Multicast Configuration Guide*.

If the querier is running IGMPv2, IGMP snooping uses the IGMP snooping configured values for robustness variable and query interval. These parameter values must match the configured values for the querier. In most cases, if you are interacting with other Cisco routers, you should not need to explicitly configure these values—the default values for IGMP snooping should match the default values of the querier. If they do not, use the **querier robustness-variable** and **querier query-interval** commands to configure matching values.



Note

Cisco IOS and Cisco IOS XR software use the nonstandard default value of 60 for query interval.

**Note**

IGMPv3 general queries convey values for robustness variable and query interval (QRV and QQI, respectively). IGMP snooping uses the values from the query, making the IGMP snooping GMI exactly match that of the querier.

The scope for this command is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add the command to a profile that configures the query interval:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# querier query-interval 1500
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier robustness-variable, on page 303	Configures a robustness variable for an internal querier.
internal-querier query-interval, on page 301	Configures the query interval for an internal querier.
querier robustness-variable, on page 323	Configures the robustness variable required for processing IGMPv2 membership reports.

querier robustness-variable

To configure the robustness variable for processing IGMPv2 membership states, use the **querier robustness-variable** command in IGMP snooping profile configuration mode. To return to the default setting, use the **no** form of this command.

querier robustness-variable *robustness-number*

no querier robustness-variable

Syntax Description

<i>robustness-number</i>	Specifies the integer to use as the robustness variable in calculations performed by IGMP snooping when processing IGMPv2 messages. Note IGMPv3 messages convey the robustness variable from the querier. Valid values are integers from 1 to 7. The default is 2.

Command Default

2

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Robustness variable is an integer used to influence the calculated GMI. GMI controls when IGMP snooping expires stale group membership states. For more information about GMI, see the “Implementing IGMP Snooping on Cisco ASR 9000 Series Routers” module in the *Cisco ASR 9000 Series Routers Multicast Configuration Guide*.

If the querier is running IGMPv2, IGMP snooping uses the IGMP snooping configured values for robustness variable and query interval. These parameter values must match the configured values for the querier. In most cases, if you are interacting with other Cisco routers, you should not need to explicitly configure these values—the default values for IGMP snooping should match the default values of the querier. If they do not, use the **querier robustness-variable** and **querier query-interval** commands to configure matching values.

**Note**

IGMPv3 general queries convey values for robustness variable and query interval (QRV and QQI, respectively). IGMP snooping uses the values from the query, making the IGMP snooping GMI exactly match that of the querier.

The scope for this command is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add the command to a profile that configures the robustness variable:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# querier robustness-variable 1
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier robustness-variable, on page 303	Configures a robustness variable for an internal querier.
internal-querier query-interval, on page 301	Configures the query interval for an internal querier.
querier query-interval, on page 321	Configures the query interval required for processing IGMPv2 membership reports.

redundancy iccp-group report-standby-state disable

To enable IGMP Snooping for generating unsolicited state-change reports only when the port transitions from standby to active, use the **redundancy iccp-group report-standby-state disable** command in IGMP snooping profile configuration mode. To use the default behavior, use the **no** form of this command.

redundancy iccp-group report-standby-state disable

no redundancy iccp-group report-standby-state disable

**Note**

By default, IGMP Snooping generates state-change and current-state reports to all multicast routers to reflect state that exists on standby MC-LAG ports only. This causes the upstream sources to forward multicast streams to the router, where they will be dropped (on egress side).

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

IGMP snooping profile configuration (config-igmp-snooping-profile)

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Note**

This command is applicable only when MC-LAG is configured.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to use the **redundancy iccp-group report-standby-state disable** command:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# redundancy iccp-group  
report-standby-state disable
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

report-suppression disable

To disable IGMPv2 report suppression or IGMPv3 proxy reporting, use the **report-suppression disable** command in IGMP snooping profile configuration mode. To enable report suppression or proxy reporting functionality, use the **no** form of this command.

report-suppression disable

no report-suppression disable

Syntax Description

This command has no arguments or keywords.

Command Default

Report suppression and proxy reporting, whichever is appropriate, are enabled by default

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to disable report suppression for IGMPv2 queriers and proxy reporting for IGMPv3 queriers.

Both features are enabled by default, with the following results:

- IGMPv2 report suppression—For IGMPv2 bridge domain queriers, IGMP snooping suppresses reports from a host if the report was previously forwarded from another host. IGMP snooping sends only the first join and last leave to mrouter ports.
- IGMPv3 proxy reporting—For IGMPv3 bridge domain queriers, IGMP snooping acts as a proxy, generating state change reports from a proxy reporting IP address. You can configure that IP address using the **system-ip-address** command. The default is 0.0.0.0.

These features are enabled and disabled per bridge domain. This command is ignored if it appears in a profile attached to a port.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add the command to a profile to turn off report suppression and proxy reporting:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# report-suppression disable
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
system-ip-address, on page 383	Configures an IP address used by IGMP snooping.

router-alert-check disable

To disable the IGMP snooping check for the presence of the router alert option in the IP packet header, use the **router-alert-check disable** command in IGMP snooping profile configuration mode. To enable this functionality after a disable, use the **no** form of this command.

router-alert-check disable

no router-alert-check disable

Syntax Description This command has no arguments or keywords.

Command Default The router alert check feature is enabled by default.

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, IGMP snooping checks for the presence of the router alert option in the IP packet header of the IGMP message and drops packets that do not include this option. If your network performs this validation elsewhere, you can disable this IGMP snooping validation.

You can disable this check using the **router-alert-check disable** command, in which case IGMP snooping does perform the validation before processing the message.

The scope for this configuration option is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to add the command to a profile that turns off the router alert check:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# router-alert-check disable
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

router-guard

To block a port from receiving query packets, use the **router-guard** command in IGMP snooping profile configuration mode. To remove the restriction, use the **no** form of this command.

router-guard

no router-guard

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Router guard is a security feature that prevents malicious users from making a host port into an mrouter port. (This undesirable behavior is known as spoofing.) When a port is protected with the **router-guard** command, it cannot be dynamically discovered as an mrouter. When router guard is on a port, IGMP snooping filters protocol packets sent to the port and discards any that are multicast router control packets.



Caution

If you add the **router-guard** command in a bridge domain profile, you disable dynamic discovery of all mrouters in that bridge domain.

You can use the **router-guard** and the **mrouter** commands on the same port to configure a guarded port as a static mrouter. For example:

- In situations where there are a large number of downstream host ports, you may want to block dynamic mrouter discovery and configure static mrouters. In this case, configure the router guard feature at the domain level. By default, it will be applied to all ports, including the (typically) large number of downstream host ports. Then use another profile without router guard configured for the relatively few upstream ports on which you want to permit dynamic mrouter discovery or configure static mrouters.
- In situations when incompatibilities with non-Cisco equipment prevents correct dynamic discovery, you can disable all attempts for dynamic discovery using the router guard feature, and statically configure the mrouter.

If you are using the router guard feature because there is an incompatible IGMP router on the port, you should also configure the **mrouter** command on the port to ensure that the router receives IGMP reports and multicast flows.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add the command to a profile that prevents a port from being dynamically discovered as an mrouter:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# router-guard
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
internal-querier, on page 296	Sets a port to send query packets to bridge domain ports.
mrouter, on page 319	Sets a port to receive query packets.

show igmp snooping bridge-domain

To display IGMP snooping configuration information and traffic statistics for bridge domains, use the **show igmp snooping bridge-domain** command in EXEC mode.

show igmp snooping bridge-domain [*bridge-domain-name*] [**detail** [**statistics** [**include-zeroes**]]]

Syntax Description

<i>bridge-domain-name</i>	(Optional) Displays information only for the specified bridge domain.
detail	(Optional) Includes more details, including configuration information about the bridge domain querier.
statistics	(Optional) Includes traffic counters and statistics.
include-zeroes	(Optional) Includes all statistics, even if they are zero. Without this keyword, many statistics are omitted from the display when their values are zero.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Bridge domain counters for access group permits, access group denials, and group limits exceeded fields were added to the detail statistics display output.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays IGMP snooping information by bridge domain. Use the command without any keywords to display summary information about all bridge domains, in a single line per bridge domain.

Use optional keywords to request additional details and traffic statistics per bridge domain. You can also limit the display to a single bridge domain.

The **statistics** keyword displays IGMP traffic information, including IGMP queries, reports, and leaves. The three columns in the statistics section of the display are:

- Received—Number of packets received.

show igmp snooping bridge-domain

- Reinjected—Number of packets received, processed, and reinjected back into the forwarding path.
- Generated—Number of packets generated by the IGMP snooping application and injected into the forwarding path.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows the basic command without any keywords.

```
RP/0/RSP0/CPU0:router# show igmp snooping bridge-domain
```

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
-----	-----	---	---	-----	-----	-----	-----
Group1:BD-1	profile1	Y	v2	8	2	5	0
Group1:BD-2		N	--	0	0	0	0
Group1:BD-3	profile1	Y	v3	6	3	2	2
Group1:BD-4		N	--	0	0	0	0
Group1:BD-5	profile1	Y	v3	2	1	1	0

The following example shows the summary line for a named bridge domain.

```
RP/0/RSP0/CPU0:router# show igmp snooping bridge-domain Group1:BD-1
```

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
-----	-----	---	---	-----	-----	-----	-----
Group1:BD-1	profile1	Y	v2	8	2	5	0

The following example shows detailed information about all bridge domains:

```
RP/0/RSP0/CPU0:router# show igmp snooping bridge-domain detail
```

Bridge Domains:	5
IGMP Snooping Bridge Domains:	3

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
-----	-----	---	---	-----	-----	-----	-----
Group1:BD-1	profile1	Y	v2	8	2	5	0

Profile Configured Attributes:

```

System IP Address:      0.0.0.0
Minimum Version:        2
Report Suppression:     Enabled
TCN Query Solicit:     Disabled
TCN Membership Sync:    Disabled
TCN Flood:              Enabled
TCN Flood Query Count:  2
ICCP Group Report Standby State: Disabled
Router Alert Check:     Enabled
TTL Check:              Enabled
Internal Querier Support: Disabled
Querier Query Interval: 60 (seconds)
Querier LMQ Interval:   1000 (milliseconds)
Querier LMQ Count:      2
Querier Robustness:      2
Startup Query Interval: 15 seconds
Startup Query Count:     2
Startup Query Max Response Time: 10.0 seconds
Querier:
  IP Address:           192.1.1.10

```

```

Port: GigabitEthernet0/2/0/10.1
Version: v2
Query Interval: 60 seconds
Robustness: 2
Max Resp Time: 1.0 seconds
Time since last G-Query: 8 seconds
Mrouter Ports: 2
  Dynamic: GigabitEthernet0/2/0/10.1
  Static: GigabitEthernet0/2/0/10.2
STP Forwarding Ports: 0
ICCP Group Ports: 0
Groups: 5
  Member Ports: 9
V3 Source Groups: 0
  Static/Include/Exclude: 0/0/0
  Member Ports (Include/Exclude): 0/0

```

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
Group1:BD-2		N	--	0	0	0	0

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
Group1:BD-3	profile1	Y	v3	6	3	2	2

Profile Configured Attributes:

```

System IP Address: 0.0.0.0
Minimum Version: 2
Report Suppression: Enabled
TCN Query Solicit: Disabled
TCN Flood Query Count: 2
Router Alert Check: Enabled
TTL Check: Enabled
Internal Querier Support: Disabled
Querier Query Interval: 60 (seconds)
Querier LMQ Interval: 1000 (milliseconds)
Querier LMQ Count: 2
Querier Robustness: 2
Querier:
  IP Address: 192.1.1.10
  Port: GigabitEthernet0/2/0/10.11
  Version: v3
  Query Interval: 60 seconds
  Robustness: 2
  Max Resp Time: 10.0 seconds
  Time since last G-Query: 7 seconds
Mrouter Ports: 3
  Dynamic: GigabitEthernet0/2/0/10.11
  Dynamic: GigabitEthernet0/2/0/10.10
  Dynamic: GigabitEthernet0/2/0/10.9
STP Forwarding Ports: 0
Groups: 2
  Member Ports: 7
V3 Source Groups: 2
  Static/Include/Exclude: 0/1/1
  Member Ports (Include/Exclude): 5/6

```

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
Group1:BD-4		N	--	0	0	0	0

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
Group1:BD-5	profile1	Y	v3	2	1	1	0

Profile Configured Attributes:

```

System IP Address: 0.0.0.0
Minimum Version: 2
Report Suppression: Enabled
TCN Query Solicit: Disabled
TCN Flood Query Count: 2

```

show igmp snooping bridge-domain

```

Router Alert Check:      Enabled
TTL Check:              Enabled
Internal Querier Support: Disabled
Querier Query Interval: 60 (seconds)
Querier LMQ Interval:   1000 (milliseconds)
Querier LMQ Count:      2
Querier Robustness:     2
Querier:
  IP Address:            192.1.1.10
  Port:                  GigabitEthernet0/2/0/10.15
  Version:               v3
  Query Interval:        60 seconds
  Robustness:            2
  Max Resp Time:         10.0 seconds
  Time since last G-Query: 6 seconds
Mrouter Ports:          1
  Dynamic:               GigabitEthernet0/2/0/10.15
STP Forwarding Ports:   0
Groups:                 1
  Member Ports:          2
V3 Source Groups:       0
  Static/Include/Exclude: 0/0/0
  Member Ports (Include/Exclude): 0/0

```

The following example displays traffic statistics with detailed information. The display omits many statistics whose values are zero.

RP/0/RSP0/CPU0:router# **show igmp snooping bridge-domain Group1:BD-1 detail statistics**

Bridge Domain	Profile	Act	Ver	#Ports	#Mrtrs	#Grps	#SGs
-----	-----	---	---	-----	-----	-----	-----
Group1:BD-1	profile1	Y	v2	8	2	5	0

Profile Configured Attributes:

```

System IP Address:      0.0.0.0
Minimum Version:        2
Report Suppression:     Enabled
TCN Query Solicit:      Disabled
TCN Flood:              Enabled
TCN Flood Query Count:  2
TCN Membership Sync:    Disabled
ICCP Group Report Standby State: Disabled
Router Alert Check:     Enabled
TTL Check:              Enabled
Unsolicited Report Interval: 1000 (milliseconds)
Internal Querier Support: Disabled
Querier Query Interval: 60 (seconds)
Querier LMQ Interval:   1000 (milliseconds)
Querier LMQ Count:      2
Querier Robustness:     2
Startup Query Interval: 15 seconds
Startup Query Count:    2
Startup Query Max Response Time: 10.0 seconds

```

Querier:

```

IP Address:            192.1.1.10
Port:                  GigabitEthernet0/2/0/10.1
Version:               v2
Query Interval:        60 seconds
Robustness:            2
Max Resp Time:         1.0 seconds
Time since last G-Query: 3 seconds
Mrouter Ports:          2
  Dynamic:               GigabitEthernet0/2/0/10.1
  Static:                GigabitEthernet0/2/0/10.2
STP Forwarding Ports:   0
Groups:                 5
  Member Ports:          9
V3 Source Groups:       0
  Static/Include/Exclude: 0/0/0
  Member Ports (Include/Exclude): 0/0

```

```

Traffic Statistics (elapsed time since last cleared 00:32:04):
      Received  Reinjected  Generated
Messages:      473      236      236
  IGMP General Queries:      237      0      0
  IGMP Group Specific Queries:      0      0      0
  IGMP G&S Specific Queries:      0      0      0
  IGMP V2 Reports:      236      236      236
  IGMP V3 Reports:      0      0      0
  IGMP V2 Leaves:      0      0      0
  IGMP Global Leaves:      0      -      0
  PIM Hellos:      0      0      -
Rx Packet Treatment:
  Packets Flooded:      0
  Packets Forwarded To Members:      0
  Packets Forwarded To M routers:      236
  Packets Consumed:      237
Rx Errors:
  None
Tx Errors:
  None
Startup Query Sync Statistics:
  None
ICCP Group Port Statistics (elapsed time since last cleared 01:21:27):
  Port Created Standby:      6
  Port Created Active:      1
  Port Goes Standby:      6
  Port Goes Active:      7
ICCP Traffic Statistics (elapsed time since last cleared 01:21:27):
Rx Messages:
  App State TLVs:      24006
  App State start of sync:      6
  App State end of sync:      6
  Request Sync TLVs:      2
  Port Membership TLVs:      24002
  Port Membership adds:      23966
  Port Membership removes:      8000
  Querier Info TLVs:      2
Rx Errors:
  App State sync TLVs ignored:      2
Tx Messages:
  App State replay attempts:      2
  Request Sync TLVs:      6
  Port Membership TLVs:      16651
  Port Membership adds:      16123
  Port Membership removes:      5543
Tx Errors:
  None

```

The following example shows details for all statistics regardless of whether their values are zero.

```
RP/0/RSP0/CPU0:router# show igmp snooping bridge-domain Group1:BD-1 detail statistics
include-zeroes
```

Bridge Domain	Profile	Act	Ver	#Ports	#Mtrrs	#Grps	#SGs
-----	-----	---	---	-----	-----	-----	-----
Group1:BD-1	profile1	Y	v2	8	2	5	0

```

Profile Configured Attributes:
  System IP Address:      0.0.0.0
  Minimum Version:      2
  Report Suppression:      Enabled
  TCN Query Solicit:      Disabled
  TCN Flood:      Enabled
  TCN Flood Query Count:      2
  TCN Membership Sync:      Disabled
  ICCP Group Report Standby State:      Disabled
  Router Alert Check:      Enabled
  TTL Check:      Enabled
  Internal Querier Support:      Disabled
  Querier Query Interval:      60 (seconds)
  Querier LMQ Interval:      1000 (milliseconds)
  Querier LMQ Count:      2

```

show igmp snooping bridge-domain

```

Querier Robustness:                2
Querier:
  IP Address:                      192.1.1.10
  Port:                           GigabitEthernet0/2/0/10.1
  Version:                         v2
  Query Interval:                  60 seconds
  Robustness:                      2
  Max Resp Time:                   1.0 seconds
  Time since last G-Query:         3 seconds
Mrouter Ports:                    2
  Dynamic:                        GigabitEthernet0/2/0/10.1
  Static:                         GigabitEthernet0/2/0/10.2
STP Forwarding Ports:             0
Groups:                           5
  Member Ports:                   9
V3 Source Groups:                 0
  Static/Include/Exclude:         0/0/0
  Member Ports (Include/Exclude): 0/0
Traffic Statistics (elapsed time since last cleared 00:32:52):
      Received  Reinjected  Generated
Messages:
  IGMP General Queries:           486      243      242
  IGMP Group Specific Queries:    243      0        0
  IGMP G&S Specific Queries:      0        0        0
  IGMP V2 Reports:                243      243      242
  IGMP V3 Reports:                0        0        0
  IGMP V2 Leaves:                 0        0        0
  IGMP Global Leaves:             0        -        0
  PIM Hellos:                     0        0        -
Rx Packet Treatment:
  Packets Flooded:                0
  Packets Forwarded To Members:    0
  Packets Forwarded To Mrouters:   243
  Packets Consumed:               243
Reports Suppressed:               0
IGMP Blocks Ignored in V2 Compat Mode: 0
IGMP EX S-lists Ignored in V2 Compat Mode: 0
Rx Errors:
  Packets On Inactive Bridge Domain: 0
  Packets On Inactive Port:         0
  Packets Martian:                  0
  Packets Bad Protocol:             0
  Packets DA Not Multicast:         0
  Packets Missing Router Alert:     0
  Packets Missing Router Alert Drop: 0
  Packets Bad IGMP Checksum:        0
  Packets TTL Not One:              0
  Packets TTL Not One Drop:         0
  Queries Too Short:                0
  V1 Reports Too Short:             0
  V2 Reports Too Short:             0
  V3 Reports Too Short:             0
  V2 Leaves Too Short:             0
  IGMP Messages Unknown:            0
  IGMP Messages GT Max Ver:         0
  IGMP Messages LT Min Ver:         0
  Queries Bad Source:              0
  Queries Dropped by S/W Router Guard: 0
  General Queries DA Not All Nodes: 0
  GS-Queries Invalid Group:         0
  GS-Queries DA Not Group:          0
  GS-Queries Not From Querier:      0
  GS-Queries Unknown Group:         0
  Reports Invalid Group:            0
  Reports Link-Local Group:         0
  Reports DA Not Group:             0
  Reports No Querier:               0
  Leaves Invalid Group:             0
  Leaves DA Not All Routers:        0
  Leaves No Querier:               0
  Leaves Non-Member:               0
  Leaves Non-Dynamic Member:        0
  Leaves Non-V2 Member:            0

```

```

V3 Reports Invalid Group: 0
V3 Reports Link-Local Group: 0
V3 Reports DA Not All V3 Routers: 0
V3 Reports No Querier: 0
V3 Reports Older Version Querier: 0
V3 Reports Invalid Group Record Type: 0
V3 Reports No Sources: 0
V3 Leaves Non-Member: 0
PIM Msgs Dropped by S/W Router Guard: 0
Tx Errors:
  V3 Sources Not Reported: 0
Startup Query Sync Statistics:
  None
ICCP Group Port Statistics (elapsed time since last cleared 01:21:27):
  Port Created Standby: 6
  Port Created Active: 1
  Port Goes Standby: 6
  Port Goes Active: 7
ICCP Traffic Statistics (elapsed time since last cleared 01:21:27):
  Rx Messages:
    App State TLVs: 24006
    App State start of sync: 6
    App State end of sync: 6
    Request Sync TLVs: 2
    Port Membership TLVs: 24002
    Port Membership adds: 23966
    Port Membership removes: 8000
    Querier Info TLVs: 2
  Rx Errors:
    App State sync TLVs ignored: 2
  Tx Messages:
    App State replay attempts: 2
    Request Sync TLVs: 6
    Port Membership TLVs: 16651
    Port Membership adds: 16123
    Port Membership removes: 5543
  Tx Errors:
    None

```

The detail statistics display shows the following new bridge-domain counters:

```

RP/0/RSP0/CPU0:router# show igmp snooping bridge-domain Group1:BD-1 detail statistics
#Access Group Permits
#Access Group Denials
#Group Limits Exceeded

```

Related Commands

Command	Description
clear igmp snooping bridge-domain, on page 277	Clears traffic counters at the bridge domain level.

show igmp snooping group

To display IGMP group membership information, use the **show igmp snooping group** command in EXEC mode.

```
{show igmp snooping group [summary [ group-address ] [bridge-domain bridge-domain-name] port
{interface-name| neighbor ipaddr pw-id id}]] [[ group-address ] [bridge-domain bridge-domain-name|
port {interface-name| neighbor ipaddr pw-id id}] [source source-address] [detail]]}
```

Syntax Description

summary	(Optional) Provides per group summary information.
<i>group-address</i>	(Optional) Provides IP group address information for the specified group in <i>A.B.C.D</i> format.
bridge-domain <i>bridge-domain-name</i>	(Optional) Provides group membership information for the specified bridge domain.
port <i>interface-name</i>	(Optional) Provides group membership information for the specified AC port.
port neighbor <i>ipaddr pw-id id</i>	(Optional) Provides group membership information for the specified PW port.
source <i>source-address</i>	(Optional) Provides group membership information for groups indicating interest in a specified source address.
detail	(Optional) Provides detailed information in a multiline display per group.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to display information about group membership in the Layer -2 forwarding tables. The display includes indicators identifying whether the group information was obtained dynamically (for example, snooped) or statically configured.

The command offers the following levels of detail:

- The basic command with no keywords displays group membership information as one line per port within group.
- The **summary** keyword summarizes the port statistics into one line per group. The **summary** keyword is mutually exclusive with the **port-view**, **source**, and **detail** keywords.
- The **detail** keyword includes traffic statistics and counters.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows group membership information by groups within bridge domains.

```
RP/0/RSP0/CPU0:router# show igmp snooping group
```

Key: GM=Group Filter Mode, PM=Port Filter Mode

Flags Key: S=Static, D=Dynamic, E=Explicit Tracking, R=Replicated

Bridge Domain Group1:BD-1

Group	Ver	GM	Source	PM	Port	Exp	Flg
225.1.1.1	V2	-	-	-	GigabitEthernet0/2/0/10.1	never	S
238.1.1.1	V2	-	-	-	GigabitEthernet0/2/0/10.1	71	D
238.1.1.1	V2	-	-	-	GigabitEthernet0/2/0/10.5	103	D
238.1.1.2	V2	-	-	-	GigabitEthernet0/2/0/10.2	79	D
238.1.1.2	V2	-	-	-	GigabitEthernet0/2/0/10.6	111	D
238.1.1.3	V2	-	-	-	GigabitEthernet0/2/0/10.3	87	D
238.1.1.3	V2	-	-	-	GigabitEthernet0/2/0/10.7	119	D
238.1.1.4	V2	-	-	-	GigabitEthernet0/2/0/10.4	95	D
238.1.1.4	V2	-	-	-	GigabitEthernet0/2/0/10.8	63	D

Bridge Domain Group1:BD-3

Group	Ver	GM	Source	PM	Port	Exp	Flg
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.10	-	D
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.11	-	D
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.12	-	D
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.13	-	D
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.14	-	D
227.1.1.1	V3	EX	10.1.1.1	EX	GigabitEthernet0/2/0/10.9	-	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.10	123	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.11	83	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.12	91	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.13	99	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.14	107	D
227.1.1.1	V3	EX	*	EX	GigabitEthernet0/2/0/10.9	115	D
227.1.1.2	V3	EX	10.2.3.4	IN	GigabitEthernet0/2/0/10.10	121	D
227.1.1.2	V3	EX	10.2.3.4	IN	GigabitEthernet0/2/0/10.11	129	D
227.1.1.2	V3	EX	10.2.3.4	IN	GigabitEthernet0/2/0/10.12	89	D
227.1.1.2	V3	EX	10.2.3.4	IN	GigabitEthernet0/2/0/10.13	97	D
227.1.1.2	V3	EX	10.2.3.4	IN	GigabitEthernet0/2/0/10.14	105	D
227.1.1.2	V3	EX	*	EX	GigabitEthernet0/2/0/10.9	124	D

show igmp snooping group

```

                                Bridge Domain Group1:BD-5
Group      Ver  GM  Source      PM  Port      Exp  Flg
----
227.1.1.1  V3  EX  *          EX  GigabitEthernet0/2/0/10.15  114  D
227.1.1.1  V3  EX  *          EX  GigabitEthernet0/2/0/10.16  122  D

```

The following example shows group membership information by group within a specific bridge domain.

```
RP/0/RSP0/CPU0:router# show igmp snooping group bridge-domain Group1:BD-1
```

Key: GM=Group Filter Mode, PM=Port Filter Mode

Flags Key: S=Static, D=Dynamic, E=Explicit Tracking, R=Replicated

```

                                Bridge Domain Group1:BD-1
Group      Ver  GM  Source      PM  Port      Exp  Flg
----
225.1.1.1  V2  -  -          -  GigabitEthernet0/2/0/10.1  never  S
238.1.1.1  V2  -  -          -  GigabitEthernet0/2/0/10.1  84    D
238.1.1.1  V2  -  -          -  GigabitEthernet0/2/0/10.5  116   D
238.1.1.2  V2  -  -          -  GigabitEthernet0/2/0/10.2  92    D
238.1.1.2  V2  -  -          -  GigabitEthernet0/2/0/10.6  60    D
238.1.1.3  V2  -  -          -  GigabitEthernet0/2/0/10.3  100   D
238.1.1.3  V2  -  -          -  GigabitEthernet0/2/0/10.7  68    D
238.1.1.4  V2  -  -          -  GigabitEthernet0/2/0/10.4  108   D
238.1.1.4  V2  -  -          -  GigabitEthernet0/2/0/10.8  76    D

```

The following example shows group membership information by groups within a specific port.

```
RP/0/RSP0/CPU0:router# show igmp snooping group port GigabitEthernet 0/2/0/10.10
```

Key: GM=Group Filter Mode, PM=Port Filter Mode

Flags Key: S=Static, D=Dynamic, E=Explicit Tracking, R=Replicated

```

                                Bridge Domain Group1:BD-3
Group      Ver  GM  Source      PM  Port      Exp  Flg
----
227.1.1.1  V3  EX  10.1.1.1    EX  GigabitEthernet0/2/0/10.10  -     D
227.1.1.1  V3  EX  *           EX  GigabitEthernet0/2/0/10.10  111   D
227.1.1.2  V3  EX  10.2.3.4    IN  GigabitEthernet0/2/0/10.10  109   D

```

The following example summarizes each group's membership information into a single line.

```
RP/0/RSP0/CPU0:router# show igmp snooping group summary
```

```

                                Bridge Domain Group1:BD-1
Group      Source      Ver  GM  #Mem #Inc #Exc
----
225.1.1.1  -          V2  -   1    -    -
238.1.1.1  -          V2  -   2    -    -
238.1.1.2  -          V2  -   2    -    -
238.1.1.3  -          V2  -   2    -    -
238.1.1.4  -          V2  -   2    -    -

```

```

                                Bridge Domain Group1:BD-3
Group      Source      Ver  GM  #Mem #Inc #Exc
----
227.1.1.1  10.1.1.1    V3  EX   -    0    6
227.1.1.1  *           V3  EX   6    -    -
227.1.1.1  *           V3  EX   6    -    -
227.1.1.2  10.2.3.4    V3  EX   -    5    0
227.1.1.2  *           V3  EX   1    -    -
227.1.1.2  *           V3  EX   1    -    -

```

```

                                Bridge Domain Group1:BD-5
Group      Source      Ver  GM  #Mem #Inc #Exc
----

```

```

-----
227.1.1.1      *          --- -- -----
                V3  EX  2  -    -

```

The following example shows detail information about each group.

```
RP/0/RSP0/CPU0:router# show igmp snooping group detail
```

```
Bridge Domain Group1:BD-1
```

```

Group Address:                225.1.1.1
  Version:                    V2
  Uptime:                     00:42:13
  Port Count:                  1
    GigabitEthernet0/2/0/10.1:
      Uptime:                   00:42:13
      Persistence:              static
      Expires:                  never
Group Address:                238.1.1.1
  Version:                    V2
  Uptime:                     00:41:38
  Port Count:                  2
    GigabitEthernet0/2/0/10.1:
      Uptime:                   00:41:38
      Persistence:              dynamic
      Expires:                  119
    GigabitEthernet0/2/0/10.5:
      Uptime:                   00:41:06
      Persistence:              dynamic
      Expires:                  87
Group Address:                238.1.1.2
  Version:                    V2
  Uptime:                     00:41:30
  Port Count:                  2
    GigabitEthernet0/2/0/10.2:
      Uptime:                   00:41:30
      Persistence:              dynamic
      Expires:                  63
    GigabitEthernet0/2/0/10.6:
      Uptime:                   00:40:58
      Persistence:              dynamic
      Expires:                  95
Group Address:                238.1.1.3
  Version:                    V2
  Uptime:                     00:41:22
  Port Count:                  2
    GigabitEthernet0/2/0/10.3:
      Uptime:                   00:41:22
      Persistence:              dynamic
      Expires:                  71
    GigabitEthernet0/2/0/10.7:
      Uptime:                   00:40:50
      Persistence:              dynamic
      Expires:                  103
Group Address:                238.1.1.4
  Version:                    V2
  Uptime:                     00:41:14
  Port Count:                  2
    GigabitEthernet0/2/0/10.4:
      Uptime:                   00:41:14
      Persistence:              dynamic
      Expires:                  79
    GigabitEthernet0/2/0/10.8:
      Uptime:                   00:40:42
      Persistence:              dynamic
      Expires:                  111
      Bridge Domain bg1:bg1_bd1

Group Address:                225.0.0.1
  Version:                    V3
  Uptime:                     01:47:00
  Group Filter Mode:          Exclude
  Source:                     {}
  Exclude Port Count:         1

```

show igmp snooping group

```

Bundle-Ether10
  ICCP Group: 1
  Redundancy State: Active
  Uptime: 01:47:00
  Persistence: dynamic
  Expires: 197

                                Bridge Domain Group1:BD-3

Group Address: 227.1.1.1
  Version: V3
  Uptime: 00:41:35
  Group Filter Mode: Exclude
  Source Count: 1
  Static/Include/Exclude Source Count: 0/0/1
  Source: 10.1.1.1
    Static/Include/Exclude Port Count: 0/0/6
    Exclude Port Count: 6
    GigabitEthernet0/2/0/10.10:
      Uptime: 00:41:27
      Persistence: dynamic
      Expires: -
    GigabitEthernet0/2/0/10.11:
      Uptime: 00:41:19
      Persistence: dynamic
      Expires: -
    GigabitEthernet0/2/0/10.12:
      Uptime: 00:41:11
      Persistence: dynamic
      Expires: -
    GigabitEthernet0/2/0/10.13:
      Uptime: 00:41:03
      Persistence: dynamic
      Expires: -
    GigabitEthernet0/2/0/10.14:
      Uptime: 00:40:55
      Persistence: dynamic
      Expires: -
    GigabitEthernet0/2/0/10.9:
      Uptime: 00:41:35
      Persistence: dynamic
      Expires: -
  Source: *
    Exclude Port Count: 6
    GigabitEthernet0/2/0/10.10
      Uptime: 00:41:27
      Persistence: dynamic
      Expires: 91
    GigabitEthernet0/2/0/10.11
      Uptime: 00:41:19
      Persistence: dynamic
      Expires: 99
    GigabitEthernet0/2/0/10.12
      Uptime: 00:41:11
      Persistence: dynamic
      Expires: 107
    GigabitEthernet0/2/0/10.13
      Uptime: 00:41:03
      Persistence: dynamic
      Expires: 115
    GigabitEthernet0/2/0/10.14
      Uptime: 00:40:55
      Persistence: dynamic
      Expires: 123
    GigabitEthernet0/2/0/10.9
      Uptime: 00:41:35
      Persistence: dynamic
      Expires: 83
Group Address: 227.1.1.2
  Version: V3
  Uptime: 00:41:37
  Group Filter Mode: Exclude
  Source Count: 1

```

```

Static/Include/Exclude Source Count: 0/1/0
Source: 10.2.3.4
Static/Include/Exclude Port Count: 0/5/0
Include Port Count: 5
GigabitEthernet0/2/0/10.10:
  Uptime: 00:41:29
  Persistence: dynamic
  Expires: 89
GigabitEthernet0/2/0/10.11:
  Uptime: 00:41:21
  Persistence: dynamic
  Expires: 97
GigabitEthernet0/2/0/10.12:
  Uptime: 00:41:13
  Persistence: dynamic
  Expires: 105
GigabitEthernet0/2/0/10.13:
  Uptime: 00:41:05
  Persistence: dynamic
  Expires: 113
GigabitEthernet0/2/0/10.14:
  Uptime: 00:40:57
  Persistence: dynamic
  Expires: 121
Source: *
Exclude Port Count: 1
GigabitEthernet0/2/0/10.9
  Uptime: 00:41:34
  Persistence: dynamic
  Expires: 124

```

Bridge Domain Group1:BD-5

```

Group Address: 227.1.1.1
Version: V3
Uptime: 00:41:36
Group Filter Mode: Exclude
Source: *
Exclude Port Count: 2
GigabitEthernet0/2/0/10.15
  Uptime: 00:41:36
  Persistence: dynamic
  Expires: 114
GigabitEthernet0/2/0/10.16
  Uptime: 00:41:28
  Persistence: dynamic
  Expires: 122

```

If a group limit is configured on an output port, the detail display shows the group weight value associated with each group or source group on that port:

RP/0/RSP0/CPU0:router1# **show igmp snooping port group detail**

Bridge Domain bg1:bg1_bd1

```

Group Address: 225.0.0.1
Version: V3
Uptime: 01:43:25
Group Filter Mode: Exclude
Source: {}
Exclude Port Count: 1
Bundle-Ether10
  ICCP Group: 1
  Redundancy State: Active
  Uptime: 01:43:25
  Persistence: dynamic
  Expires: 249

```

RP/0/RSP0/CPU0:router2# **show igmp snooping group detail**

Bridge Domain bg1:bg1_bd1

show igmp snooping group

```
Group Address:                225.0.0.1
Version:                      V3
Uptime:                       01:43:25
Group Filter Mode:            Exclude
Source:                       {}
Exclude Port Count:           1
  Bundle-Ether10
    ICCP Group:                1
  Redundancy State:           Standby
  Uptime:                     01:43:25
  Persistence:                dynamic
  Expires:                    249
```

Related Commands

Command	Description
clear igmp snooping group, on page 279	Clears group states.

show igmp snooping port

To display IGMP snooping configuration information and traffic counters by router interface port, use the **show igmp snooping port** command in EXEC mode.

show igmp snooping port*interface-name* | **neighbor ipaddr pw-id id** | **bridge-domain bridge-domain-name****detail** [**statistics** [**include-zeroes**]]**group** [*group-address*] [**source** *source-address*] [**detail**]

Syntax Description

<i>interface-name</i>	(Optional) Displays information only for the specified AC port.
neighbor ipaddr pw-id id	(Optional) Displays information only for the specified PW port.
bridge-domain <i>bridge-domain-name</i>	(Optional) Displays information for ports in the specified bridge domain.
detail	(Optional) Includes port details, rather than a single line summary.
statistics	(Optional) Includes IGMP traffic counters and statistics in the detail display.
include-zeroes	(Optional) Includes all statistics, even if they are zero. Without this keyword, many statistics are omitted from the display when their values are zero.
group	(Optional) Provides group membership information in its entirety as received at each port. The display is organized by port, showing groups within ports.
<i>group-address</i>	(Optional) Displays information only for the specified group address, organized by port.
source <i>source-address</i>	(Optional) Displays information only for the specified source address, organized by port.
detail	(Optional) Includes group details.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Release	Modification
Release 3.9.0	The total group weight accumulated by all groups and source groups on the port, the configured limit, access group permits, access group denials, and group limits exceeded fields were added to the detail display output.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays IGMP snooping information organized by IGMP snooping port. Use the command without any keywords to display summary information about all ports, in a single line per port.

Use optional arguments and keywords to request the following:

- Limit the display to a specified port.
- Limit the display to ports under a specified bridge.
- Request details and traffic statistics per port.



Note The **statistics** keyword cannot be used in the same command with the **group** keyword.

- Organize the display by group within ports. Use the **group** keyword with or without a specified interface or bridge domain.
- Limit the group information to specific groups or source addresses.

The **statistics** keyword displays IGMP traffic information, including IGMP queries, reports, and leaves. The three columns in the statistics section of the display are:

- Received—Number of packets received.
- Rejected—Number of packets received, processed, and rejected back into the forwarding path.
- Generated—Number of packets generated by the IGMP snooping application and injected into the forwarding path.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows summary information per port:

```
RP/0/RSP0/CPU0:router# show igmp snooping port
Bridge Domain bgl:bgl_bd1
State
```


Port	Oper	STP	Red	#Grps	#SGs
Bundle-Ether10	Up	-	S 1	0	
Neighbor 40.40.40.40 pw-id 1	Up	-	-	4	0

The following example shows summary information for a specific port.

```
RP/0/RSP0/CPU0:router# show igmp snooping port GigabitEthernet 0/1/0/3.215
```

Bridge Domain 215:215		Oper	STP	Red	#Grps	#SGs
Port	State	---	---	---	---	---
GigabitEthernet0/1/0/3.215	Up	-	-	-	1	0

The following example shows detail information about a specified port.

```
RP/0/RSP0/CPU0:router# show igmp snooping port Bundle-Ether10 detail
```

```
Bundle-Ether10 is Up
  Bridge Domain:      bg1:bg1_bd1
  ICCP Group:         1
  Redundancy State:    Active since Thu Aug 26 12:52:37 2010
  IGMP Snoop Profile:  profile2
  Dynamic Mrouter Port: Querier(192.1.1.10)
  Expires:             116 seconds
  IGMP Groups:         2
  Static/Dynamic:      1/1
  IGMP Source Groups:  0
  Static/Include/Exclude: 0/0/0
  Admitted Weight      1/(no limit)
```

The following example shows detail information that includes the total group weight accumulated by all groups and source groups on the port and the configured limit—Admitted Weight: 12/16:

```
RP/0/RSP0/CPU0:router# show igmp snooping port gigabitEthernet 0/2/0/10.2 detail
GigabitEthernet0/2/0/10.2 is Up
```

Bridge Domain: bg1:bd1

IGMP Groups: 4

Static/Dynamic: 0/4

IGMP Source Groups: 0

Static/Include/Exclude: 0/0/0

Admitted Weight: 33/36

The following example shows detail, including statistics, for a specified port.

```
RP/0/RSP0/CPU0:router# show igmp snooping port GigabitEthernet 0/2/0/10.1 detail statistics
```

```
GigabitEthernet0/2/0/10.1 is Up
  Bridge Domain:      Group1:BD-1
  IGMP Snoop Profile:  profile2
  Dynamic Mrouter Port: Querier(192.1.1.10)
  Expires:             117 seconds
  IGMP Groups:         2
  Static/Dynamic:      1/1
  IGMP Source Groups:  0
  Static/Include/Exclude: 0/0/0
```

```
Access Group Permits
Access Group Denials
Group Limits Exceeded
```

show igmp snooping port

```

Traffic Statistics (elapsed time since last cleared 01:19:32):
      Received  Reinjected  Generated
Messages:      668         75         0
  IGMP General Queries:      593         0         0
  IGMP Group Specific Queries:  0         0         0
  IGMP G&S Specific Queries:  0         0         0
  IGMP V2 Reports:           75        75         0
  IGMP V3 Reports:           0         0         0
  IGMP V2 Leaves:            0         0         0
  IGMP Global Leaves:        0         -         0
  PIM Hellos:                0         0         -
Rx Packet Treatment:
  Packets Flooded:           0
  Packets Forwarded To Members: 0
  Packets Forwarded To Mrouters: 75
  Packets Consumed:          593
Rx Errors:
  None
Tx Errors:
  None

```

The following example shows all statistics, even those with zero values, for a specified port.

```

RP/0/RSP0/CPU0:router# show igmp snooping port GigabitEthernet 0/2/0/10.1 detail statistics
include-zeroes

```

```

GigabitEthernet0/2/0/10.1 is Up
  Bridge Domain:      Group1:BD-1
  IGMP Snoop Profile:  profile2
  Dynamic Mrouter Port: Querier(192.1.1.10)
    Expires:          120 seconds
  IGMP Groups:        2
    Static/Dynamic:    1/1
  IGMP Source Groups: 0
    Static/Include/Exclude: 0/0/0
Traffic Statistics (elapsed time since last cleared 01:20:42):
      Received  Reinjected  Generated
Messages:      678         76         0
  IGMP General Queries:      602         0         0
  IGMP Group Specific Queries:  0         0         0
  IGMP G&S Specific Queries:  0         0         0
  IGMP V2 Reports:           76        76         0
  IGMP V3 Reports:           0         0         0
  IGMP V2 Leaves:            0         0         0
  IGMP Global Leaves:        0         -         0
  PIM Hellos:                0         0         -
Rx Packet Treatment:
  Packets Flooded:           0
  Packets Forwarded To Members: 0
  Packets Forwarded To Mrouters: 76
  Packets Consumed:          602
Reports Suppressed:          0
IGMP Blocks Ignored in V2 Compat Mode: 0
IGMP EX S-lists Ignored in V2 Compat Mode: 0
Rx Errors:
  Packets On Inactive Bridge Domain: 0
  Packets On Inactive Port:          0
  Packets Martian:                   0
  Packets Bad Protocol:               0
  Packets DA Not Multicast:           0
  Packets Missing Router Alert:        0
  Packets Missing Router Alert Drop:   0
  Packets Bad IGMP Checksum:          0
  Packets TTL Not One:                 0
  Packets TTL Not One Drop:           0
  Queries Too Short:                  0
  V1 Reports Too Short:                0
  V2 Reports Too Short:                0
  V3 Reports Too Short:                0
  V2 Leaves Too Short:                 0
  IGMP Messages Unknown:              0
  IGMP Messages GT Max Ver:           0
  IGMP Messages LT Min Ver:           0

```

```

Queries Bad Source: 0
Queries Dropped by S/W Router Guard: 0
General Queries DA Not All Nodes: 0
GS-Queries Invalid Group: 0
GS-Queries DA Not Group: 0
GS-Queries Not From Querier: 0
GS-Queries Unknown Group: 0
Reports Invalid Group: 0
Reports Link-Local Group: 0
Reports DA Not Group: 0
Reports No Querier: 0
Leaves Invalid Group: 0
Leaves DA Not All Routers: 0
Leaves No Querier: 0
Leaves Non-Member: 0
Leaves Non-Dynamic Member: 0
Leaves Non-V2 Member: 0
V3 Reports Invalid Group: 0
V3 Reports Link-Local Group: 0
V3 Reports DA Not All V3 Routers: 0
V3 Reports No Querier: 0
V3 Reports Older Version Querier: 0
V3 Reports Invalid Group Record Type: 0
V3 Reports No Sources: 0
V3 Leaves Non-Member: 0
PIM Msgs Dropped by S/W Router Guard: 0
Tx Errors:
  V3 Sources Not Reported: 0

```

The following information shows summary information for all port groups under a specific bridge domain.

```
RP/0/RSP0/CPU0:router# show igmp snooping port bridge-domain Group1:BD-1 group
```

Key: GM=Group Filter Mode, PM=Port Filter Mode

Flags Key: S=Static, D=Dynamic, E=Explicit Tracking, R=Replicated

Bridge Domain Group1:BD-1

Port	PM	Group	Ver	GM	Source	Exp	Flg
GigabitEthernet0/2/0/10.1	-	225.1.1.1	V2	-	-	never	S
GigabitEthernet0/2/0/10.1	-	238.1.1.1	V2	-	-	77	D
GigabitEthernet0/2/0/10.2	-	238.1.1.2	V2	-	-	85	D
GigabitEthernet0/2/0/10.3	-	238.1.1.3	V2	-	-	93	D
GigabitEthernet0/2/0/10.4	-	238.1.1.4	V2	-	-	101	D
GigabitEthernet0/2/0/10.5	-	238.1.1.1	V2	-	-	109	D
GigabitEthernet0/2/0/10.6	-	238.1.1.2	V2	-	-	117	D
GigabitEthernet0/2/0/10.7	-	238.1.1.3	V2	-	-	61	D
GigabitEthernet0/2/0/10.8	-	238.1.1.4	V2	-	-	69	D

The following information shows detail information for all port groups under a specific bridge domain.

```
RP/0/RSP0/CPU0:router# show igmp snooping port bridge-domain Group1:BD-1 group detail
```

Bridge Domain Group1:BD-1

```

Port: GigabitEthernet0/2/0/10.1
  Group Address: 225.1.1.1
  Version: V2
  Uptime: 01:27:20
  Persistence: static
  Expires: never
  Group Address: 238.1.1.1
  Version: V2
  Uptime: 01:26:45
  Persistence: dynamic
  Expires: 100
Port: GigabitEthernet0/2/0/10.2
  Group Address: 238.1.1.2
  Version: V2
  Uptime: 01:26:37
  Persistence: dynamic
  Expires: 108

```

show igmp snooping port

```

Port: GigabitEthernet0/2/0/10.3
  Group Address: 238.1.1.3
  Version: V2
  Uptime: 01:26:29
  Persistence: dynamic
  Expires: 116
Port: GigabitEthernet0/2/0/10.4
  Group Address: 238.1.1.4
  Version: V2
  Uptime: 01:26:21
  Persistence: dynamic
  Expires: 60
Port: GigabitEthernet0/2/0/10.5
  Group Address: 238.1.1.1
  Version: V2
  Uptime: 01:26:13
  Persistence: dynamic
  Expires: 68
Port: GigabitEthernet0/2/0/10.6
  Group Address: 238.1.1.2
  Version: V2
  Uptime: 01:26:05
  Persistence: dynamic
  Expires: 76
Port: GigabitEthernet0/2/0/10.7
  Group Address: 238.1.1.3
  Version: V2
  Uptime: 01:25:57
  Persistence: dynamic
  Expires: 84
Port: GigabitEthernet0/2/0/10.8
  Group Address: 238.1.1.4
  Version: V2
  Uptime: 01:25:49
  Persistence: dynamic
  Expires: 92

```

Related Commands

Command	Description
clear igmp snooping port, on page 281	Clears traffic counters at the port level.

show igmp snooping profile

To display IGMP snooping profile information, use the **show igmp snooping profile** command in EXEC mode.

```
{show igmp snooping profile [summary] [ profile-name ] [detail [include-defaults]] [references  
[bridge-domain [ bridge-domain-name ]]] port [interface-name| neighbor ipaddr pw-id id]]}
```

Syntax Description

summary	(Optional) Displays a summary of profile instances, bridge domain references, and port references.
<i>profile-name</i>	(Optional) Displays information only for the named profile.
detail	(Optional) Displays the contents of profiles.
include-defaults	(Optional) Displays all default configurations with the profile contents. Without this keyword, only configured profile information is displayed.
references	(Optional) Shows which bridge domains and bridge ports reference each profile.
bridge-domain [<i>bridge-domain-name</i>]	(Optional) Provides a bridge domain filter for the references keyword. Without <i>bridge-domain-name</i> , the display shows profiles attached to all bridge domains. With <i>bridge-domain-name</i> , the display shows only the profile attached to the specified bridge domain.
port [<i>interface-name</i>] or port [neighbor <i>ipaddr</i> pw-id <i>id</i>]	(Optional) Provides a port filter for the references keyword. - With <i>interface-name</i> or neighbor specified, the display shows the profile attached to the named AC or PW. - Using the port keyword alone shows profiles attached to all ports.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	New fields were added to the detail display to show access-group, group limit, and TCN flood parameters.

Release	Modification
Release 4.0.0	New fields were added to the detail display to show ICCP Group statistics, and Startup Query parameters.

Usage Guidelines

Use this command to display the contents of profiles and to see associations of profiles with bridge-domains and ports.

The **summary** keyword lists profile names and summarizes their usage on bridge domains and ports. No other keywords can be used with **summary**.

Use the **details** keyword with a profile name to show the contents of a specific profile. Without a profile name, the **detail** keyword shows the contents of all profiles.

Use the **references** keyword to list the relationships between profiles and bridge domains or profiles and ports. You have the following options:

- Use the **references** keyword without any other keywords to show all profiles and the ports and bridge domains they are attached to.
- Use the **references** keyword with the **name** keyword to show a specific profile and where it is attached.
- Use the **port** keyword to list all ports and the profiles attached to them.
- Use the **port** keyword with a specific AC interface or PW to see the profile attached to the named port.
- Use the **bridge-domain** keyword to list all bridge domains and the profiles attached to them.
- Use the **bridge-domain** keyword with a specific bridge domain name to see the profile attached to a specific bridge domain.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example lists profile names and shows summary level profile usage.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile
```

Profile	Bridge Domain	Port
-----	-----	----
profile1	3	0
profile2	0	1
profile3	0	1

The following example shows summary level profile usage for a named profile.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile profile1
```

Profile	Bridge Domain	Port
-----	-----	----
profile1	3	0

The following example shows the contents of each profile.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile detail
```

```
IGMP Snoop Profile profile1:
```

```
    Bridge Domain References:      3
    Port References:               0
```

```
IGMP Snoop Profile profile2:
```

```
    Static Groups:                225.1.1.1
    Bridge Domain References:      0
    Port References:               1
```

```
IGMP Snoop Profile profile3:
```

```
    Static Mrouter:               Enabled
    Bridge Domain References:      0
    Port References:               1
```

The following example shows output reflecting the **access-group** , **group limit** , and **tcn flood disable** parameters:

```
RP/0/RSP0/CPU0:router# show igmp snooping profile detail
```

```
IGMP Snoop Profile profile:
```

```
    Querier LMQ Count:            2
    Access Group ACL:             iptv-white-list
    Group Policy:                  iptv-group-weights
    Group Limit:                  16
    Immediate Leave:              Enabled
    TCN Flood:                    Disabled
```

```
    Bridge Domain References:      1
    Port References:               0
```

The following example shows the contents of a named profile. In this example, the profile is empty.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile profile1 detail
```

```
IGMP Snoop Profile profile1:
```

```
    Bridge Domain References:      3
    Port References:               0
```

The following example shows the contents of a named profile and the implied default configurations:

```
RP/0/RSP0/CPU0:router# show igmp snooping profile profile1 detail include-defaults
```

```
IGMP Snoop Profile profile p1:
```

```
    System IP Address:            10.144.144.144
    Minimum Version:              2
    Report Suppression:           Enabled
    Unsolicited Report Interval:  1000 (milliseconds)
    TCN Query Solicit:            Enabled
    TCN Membership Sync:          Disabled
    TCN Flood:                    Enabled
    TCN Flood Query Count:        2
    Router Alert Check:           Disabled
    TTL Check:                    Disabled

    Internal Querier Support:      Enabled
    Internal Querier Version:      3
    Internal Querier Timeout:      0 (seconds)
```

show igmp snooping profile

```

Internal Querier Interval:          60 (seconds)
Internal Querier Max Response Time: 10 (seconds)
Internal Querier TCN Query Interval: 10 (seconds)
Internal Querier TCN Query Count:   2
Internal Querier TCN Query MRT:     0
Internal Querier Robustness:        2

Querier Query Interval:            60 (seconds)
Querier LMQ Interval:              1000 (milliseconds)
Querier LMQ Count:                 2
Querier Robustness:                2

Immediate Leave:                   Disabled
Explicit Tracking:                  Disabled
Static Mrouter:                    Disabled
Router Guard:                      Disabled

Access Group ACL:                   (empty)

Group Policy:
Group Limit:                        -1

ICCP Group Report Standby State:    Enabled

Startup Query Interval:            15 (seconds)
Startup Query Count:               2
Startup Query Max Response Time:   10 (seconds)
Startup Query on Port Up:          Enabled
Startup Query on IG Port Active:    Disabled
Startup Query on Topology Change:   Disabled
Startup Query on Process Start:     Disabled

Bridge Domain References:          1
Port References:                   0

```

The following command shows a summary of profile usage, by profile name.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile summary
```

```

Number of profiles:          3
Number of bridge domain references: 3
Number of port references:    2

```

The following command lists all IGMP snooping profiles and shows which bridge domains and ports are configured to use each profile.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile references
```

```

Profile:      profile1
  Bridge Domains:  Group1:BD-5
                  Group1:BD-3
                  Group1:BD-1
  No Port References

Profile:      profile2
  No Bridge Domain References
  Ports:      GigabitEthernet0/2/0/10.1

Profile:      profile3
  No Bridge Domain References
  Ports:      GigabitEthernet0/2/0/10.2

```

The following command lists all bridges or ports that are configured to use the profile named profile1.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile profile1 references
```

```

Profile:      profile1
  Bridge Domains:  None
  Ports:          GigabitEthernet 0/1/0/0
                  GigabitEthernet 0/1/0/1
                  GigabitEthernet 0/1/0/2
                  GigabitEthernet 0/1/0/3

```



```
GigabitEthernet 0/1/0/4
GigabitEthernet 0/1/0/5
(... missing lines)
GigabitEthernet 0/3/3/1109
GigabitEthernet 0/3/3/1110
GigabitEthernet 0/3/3/1111
```

The following example shows the profile attached to a specific bridge domain.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile references bridge-domain Group1:BD-1
```

```
Profile:                profile1
Bridge Domains:        Group1:BD-1
```

The following example shows the profile attached to a specific port.

```
RP/0/RSP0/CPU0:router# show igmp snooping profile references port GigabitEthernet 0/2/0/10.1
```

```
Profile:                profile2
Ports:                  GigabitEthernet0/2/0/10.1
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile.
show l2vpn forwarding bridge-domain mroute, on page 367	Shows profile names associated with the bridge domain and its ports.

show igmp snooping redundancy

To display IGMP snooping redundancy information, use the **show igmp snooping redundancy** command in EXEC mode.

```
{show igmp snooping redundancy iccp| [ profile-name ] [detail [include-defaults]] [references  
[bridge-domain [ bridge-domain-name ]]| port [interface-name| neighbor ipaddr pw-id id]]}
```

Syntax Description

iccp	Displays ICCP redundancy information.
<i>profile-name</i>	(Optional) Displays information only for the named profile.
detail	(Optional) Displays the contents of profiles.
include-defaults	(Optional) Displays all default configurations with the profile contents. Without this keyword, only configured profile information is displayed.
references	(Optional) Shows which bridge domains and bridge ports reference each profile.
bridge-domain [<i>bridge-domain-name</i>]	(Optional) Provides a bridge domain filter for the references keyword. Without <i>bridge-domain-name</i> , the display shows profiles attached to all bridge domains. With <i>bridge-domain-name</i> , the display shows only the profile attached to the specified bridge domain.
port [<i>interface-name</i>] or port [neighbor <i>ipaddr</i> pw-id <i>id</i>]	(Optional) Provides a port filter for the references keyword. - With <i>interface-name</i> or neighbor specified, the display shows the profile attached to the named AC or PW. - Using the port keyword alone shows profiles attached to all ports.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to display the contents of profiles and to see associations of profiles with bridge-domains and ports.

The **summary** keyword lists profile names and summarizes their usage on bridge domains and ports. No other keywords can be used with **summary**.

Use the **details** keyword with a profile name to show the contents of a specific profile. Without a profile name, the **detail** keyword shows the contents of all profiles.

Use the **references** keyword to list the relationships between profiles and bridge domains or profiles and ports. You have the following options:

- Use the **references** keyword without any other keywords to show all profiles and the ports and bridge domains they are attached to.
- Use the **references** keyword with the **name** keyword to show a specific profile and where it is attached.
- Use the **port** keyword to list all ports and the profiles attached to them.
- Use the **port** keyword with a specific AC interface or PW to see the profile attached to the named port.
- Use the **bridge-domain** keyword to list all bridge domains and the profiles attached to them.
- Use the **bridge-domain** keyword with a specific bridge domain name to see the profile attached to a specific bridge domain.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example lists profile names and shows summary level profile usage.

```
RP/0/RSP0/CPU0:router# show igmp snooping redundancy
```

Profile	Bridge Domain	Port
-----	-----	----
profile1	3	0
profile2	0	1
profile3	0	1

show igmp snooping summary

To display summary information about IGMP snooping configuration and traffic statistics for the router, use the **show igmp snooping summary** command in EXEC mode.

show igmp snooping summary [**statistics** [**include-zeroes**]]

Syntax Description

statistics	(Optional) Displays IGMP traffic counters and statistics.
include-zeroes	(Optional) Displays all statistics, even if they are zero. Without this keyword, many statistics are omitted from the display when their values are zero.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Three new fields were added to the output for the statistics display.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command summarizes the number of bridge domains, mrouter ports, host ports, groups, and sources configured on the router.

The **statistics** keyword displays IGMP traffic information, including IGMP queries, reports, and leaves. The three columns in the statistics section of the display are:

- Received—Number of packets received.
- Reinject—Number of packets received, processed, and reinjected back into the forwarding path.
- Generated—Number of packets generated by the IGMP snooping application and injected into the forwarding path.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example summarizes IGMP snooping configuration on the router:

```
RP/0/RSP0/CPU0:router# show igmp snooping summary
Bridge Domains: 5
  IGMP Snooping Bridge Domains: 3
  Ports: 16
  IGMP Snooping Ports: 16
  Mrouters: 6
  STP Forwarding Ports: 0
  IGMP Groups: 8
    Member Ports: 18
  IGMP Source Groups: 2
    Static/Include/Exclude: 0/1/1
    Member Ports (Include/Exclude): 5/6
```

The following example summarizes IGMP snooping configuration on the router and includes non-zero traffic statistics:

```
RP/0/RSP0/CPU0:router# show igmp snooping summary statistics
Bridge Domains: 5
  IGMP Snooping Bridge Domains: 3
  Ports: 16
  IGMP Snooping Ports: 16
  Mrouters: 6
  STP Forwarding Ports: 0
  ICCP Group Ports: 2
  IGMP Groups: 8
    Member Ports: 18
  IGMP Source Groups: 2
    Static/Include/Exclude: 0/1/1
    Member Ports (Include/Exclude): 5/6
```

```
Access Group Permits
Access Group Denials
Group Limits Exceeded
```

```
Traffic Statistics (elapsed time since last cleared 02:08:21):
      Received  Reinjected  Generated
Messages:      7150      894      2381
  IGMP General Queries:      2682         0         0
  IGMP Group Specific Queries:      0         0         0
  IGMP G&S Specific Queries:      0         0         0
  IGMP V2 Reports:      1787      894      893
  IGMP V3 Reports:      2681         0     1488
  IGMP V2 Leaves:      0         0         0
  IGMP Global Leaves:      0         -         0
  PIM Hellos:      0         0         -
Rx Packet Treatment:
  Packets Flooded:         0
  Packets Forwarded To Members:      0
  Packets Forwarded To Mrouters:      894
  Packets Consumed:      6256
Rx Errors:
  None
Tx Errors:
  None
Startup Query Sync Statistics:
  Stale Port Groups deleted:      1
  Stale Port SGs deleted:      1
ICCP Statistics:
  ICCP Up      1
  ICCP Down    1
  Congestion Detected      1
```

show igmp snooping summary

```

Congestion Cleared          1
Peer Up                     1
Peer Down                   1

ICCP Group Port Statistics:
Port Goes Active:           1
Port Goes Standby:          1

ICCP Traffic Statistics (elapsed time since last cleared 01:01:01):
RX Messages:
App Data messages:          1
App Data NAKs:               1
App Data TLVs:               1
App State TLVs:              1
Request Sync TLVs:           1
Port Membership TLVs:         1
Querier Info TLVs:           1
Dynamic Mrouter TLVs:        1
RX Errors:
None

TX Messages:
Request Sync TLVs:           1
Port Membership TLVs:         1
Querier Info TLVs:           1
Dynamic Mrouter TLVs:        1
TX Errors:
None

```

The following example shows all summary statistics, including those whose value is zero.

RP/0/RSP0/CPU0:router# **show igmp snooping summary statistics include-zeroes**

```

Bridge Domains:              5
IGMP Snooping Bridge Domains: 3
Ports:                       16
IGMP Snooping Ports:         16
Mrouters:                    6
STP Forwarding Ports:         0
IGMP Groups:                  8
Member Ports:                 18
IGMP Source Groups:           2
Static/Include/Exclude:      0/1/1
Member Ports (Include/Exclude): 5/6
Traffic Statistics (elapsed time since last cleared 02:08:56):
Received  Reinjectd  Generated
Messages: 7185      898      2395
IGMP General Queries: 2695      0        0
IGMP Group Specific Queries: 0        0        0
IGMP G&S Specific Queries: 0        0        0
IGMP V2 Reports:      1796     898      898
IGMP V3 Reports:      2694      0     1497
IGMP V2 Leaves:        0        0        0
IGMP Global Leaves:    0        -        0
PIM Hellos:            0        0        -
Rx Packet Treatment:
Packets Flooded:        0
Packets Forwarded To Members: 0
Packets Forwarded To Mrouters: 898
Packets Consumed:       6287
Reports Suppressed:      0
IGMP Blocks Ignored in V2 Compat Mode: 0
IGMP EX S-lists Ignored in V2 Compat Mode: 0
Rx Errors:
Packets On Inactive Bridge Domain: 0
Packets On Inactive Port: 0
Packets Martian: 0
Packets Bad Protocol: 0
Packets DA Not Multicast: 0
Packets Missing Router Alert: 0
Packets Missing Router Alert Drop: 0
Packets Bad IGMP Checksum: 0
Packets TTL Not One: 0

```

```

Packets TTL Not One Drop: 0
Queries Too Short: 0
V1 Reports Too Short: 0
V2 Reports Too Short: 0
V3 Reports Too Short: 0
V2 Leaves Too Short: 0
IGMP Messages Unknown: 0
IGMP Messages GT Max Ver: 0
IGMP Messages LT Min Ver: 0
Queries Bad Source: 0
Queries Dropped by S/W Router Guard: 0
General Queries DA Not All Nodes: 0
GS-Queries Invalid Group: 0
GS-Queries DA Not Group: 0
GS-Queries Not From Querier: 0
GS-Queries Unknown Group: 0
Reports Invalid Group: 0
Reports Link-Local Group: 0
Reports DA Not Group: 0
Reports No Querier: 0
Leaves Invalid Group: 0
Leaves DA Not All Routers: 0
Leaves No Querier: 0
Leaves Non-Member: 0
Leaves Non-Dynamic Member: 0
Leaves Non-V2 Member: 0
V3 Reports Invalid Group: 0
V3 Reports Link-Local Group: 0
V3 Reports DA Not All V3 Routers: 0
V3 Reports No Querier: 0
V3 Reports Older Version Querier: 0
V3 Reports Invalid Group Record Type: 0
V3 Reports No Sources: 0
V3 Leaves Non-Member: 0
PIM Msgs Dropped by S/W Router Guard: 0
Tx Errors:
  V3 Sources Not Reported: 0
ICCP Statistics (elapsed time since last cleared 10:56:58):
ICCP Up: 3
ICCP Down: 3
Congestion Detected: 0
Congestion Cleared: 0
Peer Up: 5
Peer Down: 1
ICCP Group Connect attempts: 4
ICCP Group Connect failures: 0
ICCP Group Disconnect attempts: 3
ICCP Group Disconnect failures: 0
ICCP Group Port Statistics (elapsed time since last cleared 10:56:58):
Port Created Down: 0
Port Created Standby: 4
Port Created Active: 0
Port Goes Down: 0
Port Goes Standby: 1
Port Goes Active: 2
ICCP Traffic Statistics (elapsed time since last cleared 10:56:58):
Rx Messages:
App Data messages: 21
App Data NAKs: 3
App Data TLVs: 21
App State TLVs: 20
App State start of sync: 6
App State end of sync: 6
Global Request Sync TLVs: 0
Request Sync TLVs: 1
Port Membership TLVs: 16
Port Membership adds: 10
Port Membership removes: 2
Querier Info TLVs: 0
Querier Info delete TLVs: 0
Dynamic Mrouter TLVs: 0
Dynamic Mrouter delete TLVs: 0
Rx Errors:

```

show igmp snooping summary

```

App State sync TLVs ignored: 4
App State TLVs ignored: 0
App Data unknown ICCP Group: 0
App Data unknown ICCP Group Port: 0
App Data wrong ICCP Group: 0
App Data BD inactive: 0
App Data BD port inactive: 0
App Data ICCP Group port not standby: 0
App Data ICCP Group port not active: 0
App Data unsupported global TLV type: 0
App Data truncated: 0
App Data length error: 0
App Data unsupported TLV type: 0
Port Membership TLV ignored, No Querier: 0
Port Membership TLV error: 0
Port Membership TLV too long: 0
Querier Info TLV error: 0
Dynamic Mrouter TLV error: 0
ICCP Rx buffer parse failures: 0
Tx Messages:
ICCP Tx buffer send count: 11
App State replay attempts: 2
Request Sync TLVs: 7
Port Membership TLVs: 4
Port Membership adds: 4
Port Membership removes: 2
Querier Info TLVs: 0
Querier Info delete TLVs: 0
Dynamic Mrouter TLVs: 0
Dynamic Mrouter delete TLVs: 0
Tx Errors:
Request to send App State refused: 0
App State replay failures: 0
Request Sync TLV Tx failures: 0
Port Membership TLV Tx failures: 0
Querier Info TLV Tx failures: 0
Querier Info delete TLV Tx failures: 0
Dynamic Mrouter TLV Tx failures: 0
Dynamic Mrouter delete TLV Tx failures: 0
ICCP Get Tx buffer parse failures: 0
ICCP Get Tx buffer send failures: 0

```


show igmp snooping trace

To display IGMP snooping process activity, use the **show igmp snooping trace** command in EXEC mode.

show igmp snooping trace [**all**| **error**| **packet-error**]

Syntax Description

all	(Optional) Displays all IGMP snooping process activity.
error	(Optional) Displays only error tracepoints.
packet-error	(Optional) Displays packet error tracepoints.

Command Default

The **all** keyword is the default when no keywords are used.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to research IGMP snooping process activity.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows IGMP snooping process status during a restart and a new profile configuration.

```
RP/0/RSP0/CPU0:router# show igmp snooping summary trace all
51 wrapping entries (1024 possible, 0 filtered, 51 total)
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP001:
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP002: ***** IGMP SNOOP PROCESS RESTART
*****
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP001:
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP286: initialize profile wavl tree
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP185: initialize bd wavl tree
Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1  TP230: initialize port wavl tree
```

show igmp snooping trace

```

Feb  2 14:30:24.902 igmpsn/all 0/5/CPU0 t1 TP019: entered init_chkpt
Feb  2 14:30:24.934 igmpsn/all 0/5/CPU0 t1 TP165: igmpsn_init_l2fib entered
Feb  2 14:30:24.934 igmpsn/all 0/5/CPU0 t1 TP611: l2fib_restart_timer_init
Feb  2 14:30:24.935 igmpsn/all 0/5/CPU0 t1 TP680: igmpsn_pd_mgid_api_init entered
Feb  2 14:30:24.937 igmpsn/all 0/5/CPU0 t1 TP681: failed to open
libl2mc_snoop_mgid_client_pd.dll
Feb  2 14:30:24.937 igmpsn/all 0/5/CPU0 t1 TP683: l2mc_snoop_pd_mgid funcs are stubbed
Feb  2 14:30:25.037 igmpsn/all 0/5/CPU0 t1 TP080: socket open succeeded
Feb  2 14:30:25.037 igmpsn/all 0/5/CPU0 t1 TP031: connection open for socket
Feb  2 14:30:25.037 igmpsn/all 0/5/CPU0 t1 TP614: igmpsn_l2fib_restart_timer_start, 300
secs
Feb  2 14:30:25.038 igmpsn/all 0/5/CPU0 t1 TP555: IGMP SNOOP PROCESS READY
Feb  2 14:30:25.038 igmpsn/all 0/5/CPU0 t1 TP017: entered event loop
Feb  2 14:30:25.038 igmpsn/all 0/5/CPU0 t1 TP112: sysdb register verification
Feb  2 14:30:25.038 igmpsn/all 0/5/CPU0 t1 TP286: initialize profile wavl tree
Feb  2 14:30:25.040 igmpsn/all 0/5/CPU0 t1 TP110: sysdb event verify func (CREATE & SET,
profile/profile1/enter)
Feb  2 14:30:25.040 igmpsn/all 0/5/CPU0 t1 TP287: create profile profile1
Feb  2 14:30:25.040 igmpsn/all 0/5/CPU0 t1 TP534: profile profile1 (0x4826b838): initialized
static_group tree
(... missing lines)

```

show l2vpn forwarding bridge-domain mroute

To display multicast routes in the forwarding tables, use the **show l2vpn forwarding bridge-domain mroute** command in EXEC mode.

show l2vpn forwarding bridge-domain [*bridge-group-name* : *bridge-domain-name*] **mroute** [**ipv4**] **location** *rack/slot/module*

Syntax Description

<i>bridge-group-name</i> <i>bridge-domain-name</i>	(Optional) Displays information for a specific bridge domain. The colon that separates the two arguments is required.
ipv4	This keyword is required.
location <i>rack/slot/module</i>	Displays route information for a specific rack/slot/module.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays multicast routes as they are converted into the forwarding plane forwarding tables. The source for the conversion is the multicast routes configured in the control plane with IGMP snooping configuration commands. If the routes displayed by this command are not as expected, check the control plane configuration and correct the corresponding IGMP snooping profiles.

Use optional arguments to limit the display to a specific bridge domain.

Task ID

Task ID	Operations
l2vpn	read

Examples

This example displays high-level statistics about routes for one bridge domain:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge-domain bg:bd mroute ipv4 location
0/0/CPU0
Bridge-Domain Name: bg:bd
Prefix: (0.0.0.0,224.0.0.0/4)
IRB platform data: {0x0, 0x0, 0x0, 0x0}, len: 0
  Ingress
    Forwarded (Packets/Bytes): 55020/75120640
    Received (Packets/Bytes): 0/0
    Punted (Packets/Bytes): 0/0
    Dropped (Packets/Bytes): 0/0
Bridge Port:
  Neighbor 2.2.2.2, pw-id 1

Bridge-Domain Name: bg:bd
Prefix: (0.0.0.0,225.0.0.1/32)
IRB platform data: {0x0, 0x0, 0x0, 0x0}, len: 0
  Ingress
    Forwarded (Packets/Bytes): 0/0
    Received (Packets/Bytes): 0/0
    Punted (Packets/Bytes): 0/0
    Dropped (Packets/Bytes): 0/0
Bridge Port:
  GigabitEthernet0/2/0/9
  Neighbor 2.2.2.2, pw-id 1

Bridge-Domain Name: bg:bd
Prefix: (0.0.0.0,225.0.0.2/32)
IRB platform data: {0x0, 0x0, 0x0, 0x0}, len: 0
  Ingress
    Forwarded (Packets/Bytes): 0/0
    Received (Packets/Bytes): 0/0
    Punted (Packets/Bytes): 0/0
    Dropped (Packets/Bytes): 0/0
Bridge Port:
  GigabitEthernet0/2/0/9
  Neighbor 2.2.2.2, pw-id 1
```

startup query count

To configure the number of startup G-queries that are to be sent to the recipient routers, use the **startup query count** command in IGMP snooping profile configuration mode. To restore the default startup query count to be the Querier's Robustness Value (QRV), use the **no** form of this command.

startup query count *number*

no startup query count

Syntax Description	<i>number</i>	Indicates the number of startup queries sent. The range is from 0-7.

Command Default	2

Command Modes	IGMP snooping profile configuration (config-igmp-snooping-profile)

Command History	Release	Modification
	Release 4.0.0	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following examples show how to configure the startup query count into an IGMP snooping profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query count
```

Related Commands	Command	Description
	igmp snooping profile , on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

startup query iccp-group

To enable the generation of startup G-query on a port, when an MC-LAG transitions from standby state to active state, use the **startup query iccp-group** command in IGMP snooping profile configuration mode. IGMP Snooping performs a mark and sweep synchronization of the IGMP snooping state over the startup query period.

To disable the startup query generation on this event, use the **no** form of this command.

startup query iccp-group port-active

no startup query iccp-group

Syntax Description

port-active	(Optional) Issues startup queries when iccp-group goes active. This parameter is specific to IGMP Snooping over MC-LAG.

Command Default

None

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If configured in a bridge-domain profile, the **startup query iccp-group** command applies to all ports in that bridge-domain. If configured in a profile attached to a specific port, this command applies to that port only.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples show how to enable the startup G-query configuration:

```
RP/0/RSP0/CPU0:router (config-igmp-snooping-profile) # startup query iccp-group
```

Related Commands

Command	Description
igmp snooping profile , on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

startup query interval

To configure the time between successive startup G-queries, use the **startup query interval** command in IGMP snooping profile configuration mode. To restore the default startup query interval of 1/4 querier's query-interval (up to a max of 32 secs), use the **no** form of this command.

startup query interval *number*

no startup query interval

Syntax Description

<i>number</i>	Interval, in seconds. The range is from 1 to 18000.

Command Default

15 seconds

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples show how to configure the startup query interval into an IGMP snooping profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query interval
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

startup query max-response-time

To configure the maximum response time (MRT) transmitted in the startup G-queries in seconds, use the **startup query max-response-time** command in IGMP snooping profile configuration mode. To restore the default startup query max-response-time to be the querier's max-response-time (MRT), use the **no** form of this command.

startup query max-response-time *number*

no startup query max-response-time

Syntax Description

<i>number</i>	Enter an interval between 1 to 25 seconds.

Command Default

10 seconds

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples show how to configure the MRT in an IGMP snooping profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query max-reponse-time
```

Related Commands

Command	Description
igmp snooping profile , on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

`startup query max-response-time`

startup query port-up disable

To disable the sending of startup G-queries on port-up, use the **startup query port-up disable** command in IGMP snooping profile configuration mode. To restore the default behavior that sends G-queries on port-up, use the **no** form of this command.

startup query port-up disable

no startup query port-up disable

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 4.0.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If configured in a bridge-domain profile, this command applies to all ports in the bridge-domain. If configured in a profile attached to a specific port, this command applies to only the specific port.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following examples show how to use the **startup query port-up disable** command:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query port-up disable
```

Related Commands	Command	Description
	igmp snooping profile , on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

startup query port-up disable

startup query process start

To enable the startup G-query generation on all ports in the bridge domain when the IGMP Snooping (IGMPSN) process restarts, use the **startup query process start** command in IGMP snooping profile configuration mode. To disable the startup query generation of this event, use the **no** form of this command. This command must be included in the bridge-domain profile.

startup query process start [sync]

no startup query process start

Syntax Description

sync	(Optional) Removes the unrefreshed membership state. This parameter instructs the IGMPSN to perform a mark and sweep synchronization of the IGMP snooping state over the startup query period.

Command Default

None

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples show how to use the **startup query process start** command into an IGMP snooping profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query process start
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

startup query topology-change

To enable startup G-query generation on all ports in the bridge domain when a topology change is indicated and the bridge is the root, use the **startup query topology-change** command in IGMP snooping profile configuration mode.

To disable the startup query generation on this event, use the **no** form of this command.

startup query topology-change [**sync**|**always**]

no startup query topology-change

Syntax Description

sync	(Optional) Removes the unrefreshed membership state. Instructs the IGMP Snooping profile to perform a mark and sweep synchronization of the IGMP snooping state over the startup query period.
always	(Optional) Instructs the IGMP Snooping profile to generate startup G-queries regardless of whether the bridge is the root.

Command Default

None

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to use the **startup query topology-change** command into an IGMP snooping profile in the Command Line Interface:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# startup query topology-change
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

static group

To configure static group membership entries in the Layer-2 forwarding tables, use the **static group** command in IGMP snooping profile configuration mode. To remove a static group entry from the forwarding tables, use the **no** form of this command.

static group *group-addr* [**source** *source-addr*]

no static group *group-addr* [**source** *source-addr*]

Syntax Description

<i>group-addr</i>	IP multicast group address.
source	(Optional) Statically forwards an (S, G) channel out of the port.
<i>source-addr</i>	IP multicast source address.

Command Default

None

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

IGMP snooping learns Layer-2 multicast groups dynamically. You can also statically configure Layer-2 multicast groups.

You can use the **static group** command in profiles intended for bridge domains or ports. If you configure this option in a profile attached to a bridge domain, it applies to all ports under the bridge.

A profile can contain multiple static groups. You can define different source addresses for the same group address. Using the **source** keyword, you can configure IGMPv3 source groups.

Static group membership supersedes any dynamic manipulation by IGMP snooping. Multicast group membership lists can contain both static and dynamic group definitions.

When you configure a static group or source group on a port, IGMP snooping adds the port as an outgoing port to the corresponding <S/*,G> forwarding entry and sends an IGMPv2 join or IGMPv3 report to all mrouter ports. IGMP snooping continues to send the membership report in response to general queries for as long as the static group remains configured on the port.

The scope of this command can be either bridge domain level or port level. If you use this command in a profile attached to a bridge domain, the static group membership applies to all ports under the bridge. If you use the command in a profile attached to a port, the static group membership applies only to that port.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples show how to add static group membership configuration into an IGMP snooping profile:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# static group 10.1.1.1
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# static group 10.1.1.1 source 10.1.12.0
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

system-ip-address

To configure an IP address for the internal querier, use the **system-ip-address** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

system-ip-address *ip-address*

no system-ip-address

Syntax Description	<i>ip-address</i>	Assigns an IP address for IGMP use.
Command Default	0.0.0.0	
Command Modes	IGMP snooping profile configuration	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **system-ip-address** command configures an IP address for IGMP snooping use. If not explicitly configured, the default address is 0.0.0.0. The default is adequate except in the following circumstances:

- If you are configuring an internal querier. The internal querier cannot use 0.0.0.0.
- If the bridge needs to communicate with a non-Cisco IGMP router that does not accept the 0.0.0.0 address.

IGMP snooping uses the value set by the **system-ip-address** command in the following ways:

- The internal-querier sends queries from the system IP address. An address other than the default 0.0.0.0 must be configured.
- IGMPv3 sends proxy reports from the system IP address. The default address 0.0.0.0 is preferred but may not be acceptable to some IGMP routers.
- In response to topology change notifications (TCNs) in the bridge domain, IGMP snooping sends global-leaves from the system IP address. The default address 0.0.0.0 is preferred but may not be acceptable to some IGMP routers.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example assigns a system IP address, overriding the default value:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# system-ip-address 10.1.1.1
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

tcn flood disable

To disable Spanning Tree Protocol (STP) port flooding during a topology change, use the **tcn flood disable** command in IGMP snooping profile configuration mode. To reenabel STP port flooding, use the **no** form of this command.

tcn flood disable

no tcn flood disable

Syntax Description This command has no arguments or keywords.

Command Default TCN flooding is enabled by default.

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples This example illustrates how to disable TCN flooding:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# tcn flood disable
```

Related Commands	Command	Description
	show igmp snooping profile, on page 353	Displays the contents of profiles and to see associations of profiles with bridge-domains and ports, including access group, group limit, and TCN flood parameters.

Command	Description
tcn flood query count, on page 387	Configures the number of general queries that must be sent before IGMP snooping stops flooding all routes in response to STP topology changes
tcn query solicit, on page 389	Enables global leave messaging on non-root bridges in response to STP topology changes.

tcn flood query count

To configure how long IGMP snooping floods all routes in response to topology changes, use the **tcn flood query count** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

tcn flood query count *number*

no tcn flood query count

Syntax Description

<i>number</i>	Specifies the number of general queries that must occur after a TCN before IGMP snooping stops multicast flooding to all ports and resumes restricted forwarding. Valid values are integers from 1 to 10.

Command Default

2

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In a Spanning Tree Protocol (STP) topology, a topology change notification (TCN) indicates that an STP topology change has occurred. As a result of a topology change, mrouter and hosts reporting group membership may migrate to other STP ports under the bridge domain. Mrouter and membership states must be relearned after a TCN.

IGMP snooping reacts to TCNs in the following way:

- 1 IGMP snooping temporarily extends the flood set for all known multicast routes to include all ports participating in STP that are in forwarding state. The short term flooding ensures that multicast delivery continues to all mrouter and all member hosts in the bridge domain while mrouter and membership states are relearned.
- 2 The STP root bridge issues a global leave (leave for group 0.0.0.0) on all ports. This action triggers mrouter to send general queries, expediting the relearning process.

**Note**

Sending global leaves for query solicitation is a Cisco-specific implementation.

- 1 When the TCN refresh period ends, IGMP snooping withdraws the non-mrouter and non-member STP ports from the multicast route flood sets. You can control the amount of time that flooding occurs with the **tcn flood query count** command. This command sets the number of IGMP general queries for which the multicast traffic is flooded following a TCN, thus influencing the refresh period.

IGMP snooping default behavior is that the STP root bridge always issues a global leave in response to a TCN, and the non-root bridges do not issue global leaves.

With the **tcn query solicit** command, you can enable a bridge to always issue a global leave in response to TCNs, even when it is not the root bridge. In that case, the root bridge and the non-root bridge would issue the global leave and both would solicit general queries in response to a TCN. Use the **no** form of the command to turn off soliciting when the bridge is not the root.

The root bridge always issues a global leave in response to a TCN. This behavior can not be disabled.

The internal querier has its own set of configuration options that control its reactions to TCNs.

The scope for this configuration option is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the tcn flood query count in an IGMP snooping profile, overriding the default:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# tcn flood query count 5
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
tcn query solicit, on page 389	Enables global leave messaging on non-root bridges in response to STP topology changes.

tcn query solicit

To enable global leave messaging on non-root bridges in response to STP topology changes, use the **tcn query solicit** command in IGMP snooping profile configuration mode. To disable this functionality (on non-root bridges), use the **no** form of this command.

tcn query solicit

no tcn query solicit

Syntax Description This command has no arguments or keywords.

Command Default It is disabled by default.

Command Modes IGMP snooping profile configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In a Spanning Tree Protocol (STP) topology, a topology change notification (TCN) indicates that an STP topology change has occurred. As a result of a topology change, mrouter and hosts reporting group membership may migrate to other STP ports under the bridge domain. Mrouter and membership states must be relearned after a TCN.

IGMP snooping reacts to TCNs in the following way:

- 1 IGMP snooping temporarily extends the flood set for all known multicast routes to include all ports participating in STP that are in forwarding state. The short term flooding ensures that multicast delivery continues to all mrouter and all member hosts in the bridge domain while mrouter and membership states are relearned.
- 2 The STP root bridge issues a global leave (leave for group 0.0.0.0) on all ports. This action triggers mrouter to send general queries, expediting the relearning process.



Note

Sending global leaves for query solicitation is a Cisco-specific implementation.

- 1 When the TCN refresh period ends, IGMP snooping withdraws the non-mrouter and non-member STP ports from the multicast route flood sets. You can control the amount of time that flooding occurs with

the **tcn flood query count** command. This command sets the number of IGMP general queries for which the multicast traffic is flooded following a TCN, thus influencing the refresh period.

IGMP snooping default behavior is that the STP root bridge always issues a global leave in response to a TCN, and the non-root bridges do not issue global leaves.

With the **tcn query solicit** command, you can enable a bridge to always issue a global leave in response to TCNs, even when it is not the root bridge. In that case, the root bridge and the non-root bridge would issue the global leave and both would solicit general queries in response to a TCN. Use the **no** form of the command to turn off soliciting when the bridge is not the root.

The root bridge always issues a global leave in response to a TCN. This behavior can not be disabled.

The internal querier has its own set of configuration options that control its reactions to TCNs.

The scope for this configuration option is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to ensure that a bridge will always issue a global leave in response to a TCN, even when it is not the STP root bridge:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# tcn query solicit
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.
tcn flood query count, on page 387	Configures how many general queries must be sent before IGMP snooping stops flooding all routes in response to STP topology changes

ttl-check disable

To disable the IGMP snooping check on the time-to-live (TTL) field in the IGMP header, use the **ttl-check disable** command in IGMP snooping profile configuration mode. To enable this functionality after a disable, use the **no** form of this command.

ttl-check disable

no ttl-check disable

Syntax Description This command has no arguments or keywords.

Command Default It is enabled by default.

Command Modes IGMP snooping profile configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, IGMP snooping examines the time-to-live (TTL) field in the IGMP header and processes packets as follows:

- If the TTL field is 1, IGMP snooping processes the packet. The TTL field is always set to 1 in the headers of IGMP reports and queries.
- If the TTL field is not 1, IGMP snooping drops the packet

When the IGMP snooping TTL check feature is disabled, IGMP snooping processes all packets without examining the TTL field in the IGMP header.

The scope for this configuration option is per bridge domain. If the command appears in profiles attached to ports, it has no effect.

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to turn off the check on the ttl field:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# ttl-check disable5
```

Related Commands

Command	Description
igmp snooping profile, on page 291	Creates or edits a profile, and attaches a profile to a bridge domain or port.

unsolicited-report-interval

To set the length of time that IGMP snooping has to send state change reports for IGMPv3 queriers when proxy reporting is enabled, use the **unsolicited-report-interval** command in IGMP snooping profile configuration mode. To return to the default value, use the **no** form of this command.

unsolicited-report-interval *timer-value*

no unsolicited-report-interval

Syntax Description

<i>timer-value</i>	Specifies the length of time that IGMP snooping can take to send state change reports for IGMPv3 queriers. Valid values are integers from 100 to 5000 (milliseconds).

Command Default

1000 (milliseconds)

Command Modes

IGMP snooping profile configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If a bridge domain querier is running IGMPv3 and proxy reporting is enabled, IGMP snooping acts as a proxy, generating reports from the proxy reporting address. As insurance against lost reports, IGMP snooping generates and forwards state change reports *robustness-variable* times, where the *robustness-variable* is the QRV value in the querier's general query. IGMP snooping forwards the reports at random intervals within the timeframe configured with the **unsolicited-report-timer** command.

Proxy reporting is enabled by default. To disable proxy reporting, use the **report-suppression disable** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the unsolicited report interval:

```
RP/0/RSP0/CPU0:router(config-igmp-snooping-profile)# unsolicited-report-interval 2000
```

Related Commands

Command	Description
report-suppression disable, on page 327	Disables IGMPv2 report suppression and IGMPv3 proxy reporting.
system-ip-address, on page 383	Configures the proxy reporting address.



Multicast PIM Commands on the Cisco ASR 9000 Series Router

This chapter describes the commands used to configure and monitor Protocol Independent Multicast (PIM). For detailed information about multicast routing concepts, configuration tasks, and examples, refer to *Cisco ASR 9000 Series Aggregation Services Router Multicast Configuration Guide*.

- [accept-register, page 398](#)
- [auto-rp candidate-rp, page 400](#)
- [bsr-border, page 403](#)
- [bsr candidate-bsr, page 405](#)
- [bsr candidate-rp, page 407](#)
- [clear pim counters, page 409](#)
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- [show pim tunnel info](#), page 503
- [show pim vrf vrf_name mdt cache](#), page 505
- [show pim vrf vrf_name rpf](#), page 506
- [show pim vrf vrf_name topology](#), page 507
- [spt-threshold infinity](#), page 508

- [ssm, page 509](#)

accept-register

To configure a rendezvous point (RP) router to filter Protocol Independent Multicast (PIM) register messages, use the **accept-register** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

accept-register *access-list-name*

no accept-register

Syntax Description	<i>access-list-name</i>	Access list number or name.

Command Default	No default behavior or values

Command Modes	PIM configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. The accept-register command prevents unauthorized sources from registering with the rendezvous point. If an unauthorized source sends a register message to the rendezvous point, the rendezvous point immediately sends back a register-stop message.

Task ID	Task ID	Operations
	multicast	read, write

Examples	The following example shows how to restrict the rendezvous point. Sources in the Source Specific Multicast (SSM) range of addresses are not allowed to register with the rendezvous point. These statements need to be configured only on the rendezvous point.

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# accept-register no-ssm-range
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# exit
RP/0/RSP0/CPU0:router(config)# ipv4 access-list no-ssm-range
```

```
RP/0/RSP0/CPU0:router(config-ipv4-acl)# deny ipv4 any 232.0.0.0 0.255.255.255  
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit any
```

auto-rp candidate-rp

To configure a router as a Protocol Independent Multicast (PIM) rendezvous point (RP) candidate that sends messages to the well-known CISCO-RP-ANNOUNCE multicast group (224.0.1.39), use the **auto-rp candidate-rp** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

auto-rp candidate-rp *type interface-path-id* **scope** *ttl-value* [**group-list** *access-list-name*] [**interval** *seconds*]

no auto-rp candidate-rp *type interface-path-id* **scope** *ttl-value* [**group-list** *access-list-name*] [**interval** *seconds*]

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
scope <i>ttl-value</i>	Specifies a time-to-live (TTL) value (in router hops) that limits the scope of the auto-rendezvous point (Auto-RP) announce messages that are sent out of that interface. Range is 1 to 255.
group-list <i>access-list-name</i>	(Optional) Specifies an access list that describes the group ranges for which this router is the rendezvous point.
interval <i>seconds</i>	(Optional) Specifies the time between rendezvous point announcements. Range is 1 to 600.

Command Default

A router is not configured as a PIM rendezvous point candidate by default.
seconds : 60

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **auto-rp candidate-rp** command is used by the rendezvous point for a multicast group range. The router sends an Auto-RP announcement message to the well-known group CISCO-RP-ANNOUNCE (224.0.1.39). This message announces the router as a candidate rendezvous point for the groups in the range described by the access list.

When the **interval** keyword is specified, the interval between Auto-RP announcements is set to number of *seconds* with the total hold time of the announcements automatically set to three times the interval time. The recommended interval time range is from 1 to 180 seconds.

The hold time of the Auto-RP announcement is the time for which the announcement is valid. After the designated hold time, the announcement expires and the entry is purged from the mapping cache until there is another announcement.

If the optional **group-list** keyword is omitted, the group range advertised is 224.0.0.0/4. This range corresponds to all IP multicast group addresses, which indicates that the router is willing to serve as the rendezvous point for all groups.

A router may be configured to serve as a candidate rendezvous point for more than one group range by a carefully crafted access list in the router configuration.

**Note**

The **auto-rp candidate-rp** command is available for IPv4 address prefixes only.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to send rendezvous point announcements from all PIM-enabled interfaces for a maximum of 31 hops. The IP address by which the router wants to be identified as a rendezvous point is the IP address associated with GigabitEthernet interface 0/1/0/1. Access list 5 designates the groups that this router serves as the rendezvous point.

```
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 5
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any 224.0.0.0 15.255.255.255
RP/0/RSP0/CPU0:router(config-ipv4-acl)# exit
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# auto-rp candidate-rp GigE 0/1/0/1 scope 31
group-list 5
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# end
```

The router identified in the following example advertises itself as the candidate rendezvous point and is associated with loopback interface 0 for the group ranges 239.254.0.0 to 239.255.255.255 and 224.0.0.0 to 231.255.255.255:

```
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 10
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any 239.254.0.0 0.0.255.255
RP/0/RSP0/CPU0:router(config-ipv4-acl)# exit
```

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# auto-rp candidate-rp loopback 0 scope 16  
group-list 10  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# end
```

bsr-border

To stop the forwarding of bootstrap router (BSR) messages on a Protocol Independent Multicast (PIM) router interface, use the **bsr-border** command in PIM interface configuration mode. To return to the default behavior, use the **no** form of this command.

bsr-border

no bsr-border

Command Default BSR messages are forwarded on the PIM router interface.

Command Modes PIM interface configuration

Command History	Release	Modification
	Release 3.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you configure the **bsr-border** command, no PIM Version 2 BSR messages are sent or received through the interface. You should configure an interface bordering another PIM domain with this command to avoid BSR messages from being exchanged between the two domains. BSR messages should not be exchanged between different domains, because routers in one domain may elect rendezvous points (RPs) in the other domain, resulting in protocol malfunction or loss of isolation between the domains.



Note This command is used for the purpose of setting up a PIM domain BSR message border, and not for multicast boundaries.

Task ID	Task ID	Operations
	multicast	read, write

Examples The following example shows how to configure the Packet-over-SONET/SDH (POS) 0/1/0/0 interface to be the PIM domain border:

```
RP/0/RSP0/CPU0:router(config)# router pim
```

```
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# interface pos 0/1/0/0  
RP/0/RSP0/CPU0:router(config-pim-ipv4-if)# bsr-border
```


bsr candidate-bsr

To configure the router to announce its candidacy as a bootstrap router (BSR), use the **bsr candidate-bsr** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

bsr candidate-bsr *ip-address* [**hash-mask-len** *length*] [**priority** *value*]

no bsr candidate-bsr

Syntax Description

<i>ip-address</i>	IP address of the BSR router for the domain. For IPv4, this is an IP address in four-part dotted-decimal notation. For IPv6, the IP address is specified in hexadecimal format using 16-bit values between colons.
hash-mask-len <i>length</i>	(Optional) Specifies the length of a mask that is to be used in the hash function. • All groups with the same seed hash (correspond) to the same rendezvous point (RP). For example, if this value is 24, only the first 24 bits of the group addresses matter. This fact allows you to get one RP for multiple groups. • For IPv4 addresses, we recommend a value of 30. The range is 0 to 32. • For IPv6 addresses, we recommend a value of 126. The range is 0 to 128.
priority <i>value</i>	(Optional) Specifies the priority of the candidate BSR. Range is 1 to 255. We recommend the BSR with the higher priority. If the priority values are the same, the router with the higher IP address is the BSR.

Command Default

value : 1

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **bsr candidate-bsr** command causes the router to send bootstrap messages to all its Protocol Independent Multicast (PIM) neighbors, with the address of the designated interface as the BSR address. Each neighbor compares the BSR address with the address it had from previous bootstrap messages (not necessarily received

on the same interface). If the current address is the same or higher address, the PIM neighbor caches the current address and forwards the bootstrap message. Otherwise, the bootstrap message is dropped.

This router continues to be the BSR until it receives a bootstrap message from another candidate BSR saying that it has a higher priority (or if the same priority, a higher IP address).



Note

Use the **bsr candidate-bsr** command only in backbone routers with good connectivity to all parts of the PIM domain. A subrouter that relies on an on-demand dial-up link to connect to the rest of the PIM domain is not a good candidate BSR.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router as a candidate BSR with a hash mask length of 30:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# bsr candidate-bsr 10.0.0.1 hash-mask-len 30
```

bsr candidate-rp

To configure the router to advertise itself as a Protocol Independent Multicast (PIM) Version 2 candidate rendezvous point (RP) to the bootstrap router (BSR), use the **bsr candidate-rp** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

bsr candidate-rp *ip-address* [**group-list** *access-list*] [**interval** *seconds*] [**priority** *value*]

no bsr candidate-rp *ip-address*

Syntax Description

<i>ip-address</i>	IP address of the router that is advertised as a candidate rendezvous point address.
group-list <i>access-list</i>	(Optional) Specifies the IP access list number or name that defines the group prefixes that are advertised in association with the rendezvous point address. The access list name cannot contain a space or quotation mark, and must begin with an alphabetic character to avoid confusion with numbered access lists.
interval <i>seconds</i>	(Optional) Specifies the candidate rendezvous point advertisement interval in seconds. Range is 30 to 600.
priority <i>value</i>	(Optional) Indicates the rendezvous point priority value. Range is 1 to 255.

Command Default

value : 1

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **bsr candidate-rp** command causes the router to send a PIM Version 2 message advertising itself as a candidate rendezvous point to the BSR. The addresses allowed by the access list, together with the router identified by the IP address, constitute the rendezvous point and its range of addresses for which it is responsible.

**Note**

Use the **bsr candidate-rp** command only in backbone routers that have good connectivity to all parts of the PIM domain. That is, a stub router that relies on an on-demand dial-up link to connect to the rest of the PIM domain is not a good candidate rendezvous point.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router to advertise itself as a candidate rendezvous point to the BSR in its PIM domain. Access list number 4 specifies the group prefix associated with the candidate rendezvous point address 172.16.0.0. This rendezvous point is responsible for the groups with the prefix 239.

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# bsr candidate-rp 172.16.0.0 group-list 4
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# exit
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 4
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any 239.0.0.0 0.255.255.255
RP/0/RSP0/CPU0:router(config-ipv4-acl)# end
```

Related Commands

Command	Description
bsr candidate-bsr, on page 405	Configures the router to announce its candidacy as a bootstrap router (BSR).

clear pim counters

To clear Protocol Independent Multicast (PIM) counters and statistics, use the **clear pim counters** command in EXEC mode.

clear pim [**vrf** *vrf-name*] [**ipv4**] **counters**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you do not explicitly specify a particular VRF, the default VRF is used.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows sample output before and after clearing PIM counters and statistics:

```
RP/0/RSP0/CPU0:router# show pim traffic
PIM Traffic Counters
Elapsed time since counters cleared: 1d01h
```

	Received	Sent
Valid PIM Packets	15759217	15214426
Hello	9207	12336
Join-Prune	1076805	531981

clear pim counters

```

Data Register      14673205      0
Null Register      73205        0
Register Stop      0            14673205
Assert             0            0
Batched Assert     0            0
Bidir DF Election  0            0
BSR Message        0            0
Candidate-RP Adv.  0            0

Join groups sent   0
Prune groups sent  0
Output JP bytes    0
Output hello bytes 4104

Errors:
Malformed Packets  0
Bad Checksums      0
Socket Errors      0
Subnet Errors      0
Packets dropped since send queue was full 0
Packets dropped due to invalid socket      0
Packets which couldn't be accessed        0
Packets sent on Loopback Errors           6
Packets received on PIM-disabled Interface 0
Packets received with Unknown PIM Version 0

```

This table describes the significant fields shown in the display.

Table 29: show pim traffic Field Descriptions

Field	Description
Elapsed time since counters cleared	Time (in days and hours) that had elapsed since the counters were cleared with the clear pim counters command.
Valid PIM Packets	Total PIM packets that were received and sent.
HelloJoin-PruneRegisterRegister StopAssert Bidir DF Election	Specific type of PIM packets that were received and sent.
Malformed Packets	Invalid packets due to format errors that were received and sent.
Bad Checksums	Packets received or sent due to invalid checksums.
Socket Errors	Packets received or sent due to errors from the router's IP host stack sockets.
Packets dropped due to invalid socket	Packets received or sent due to invalid sockets in the router's IP host stack.
Packets which couldn't be accessed	Packets received or sent due to errors when accessing packet memory.
Packets sent on Loopback Errors	Packets received or sent due to use of loopback interfaces.

Field	Description
Packets received on PIM-disabled Interface	Packets received or sent due to use of interfaces not enabled for PIM.
Packets received with Unknown PIM Version	Packets received or sent due to invalid PIM version numbers in the packet header.

```
RP/0/RSP0/CPU0:router# clear pim counters
RP/0/RSP0/CPU0:router# show pim traffic
```

```
PIM Traffic Counters
Elapsed time since counters cleared: 00:00:04
```

```
BSR Message                0    0
Candidate-RP Adv.          0    0

Join groups sent            0
Prune groups sent           0
Output JP bytes             0
Output hello bytes          0

Errors:
Malformed Packets           0
Bad Checksums               0
Socket Errors               0
Subnet Errors               0
Packets dropped since send queue was full  0
Packets dropped due to invalid socket      0
Packets which couldn't be accessed        0
Packets sent on Loopback Errors           0
Packets received on PIM-disabled Interface 0
Packets received with Unknown PIM Version 0
```

Related Commands

Command	Description
show pim traffic , on page 500	Displays Protocol Independent Multicast (PIM) traffic counter information.

clear pim topology

To clear group entries from the Protocol Independent Multicast (PIM) topology table and reset the Multicast Routing Information Base (MRIB) connection, use the **clear pim topology** command in EXEC mode.

```
clear pim [vrf vrf-name] [ipv4] topology [ip-address-name] reset
```

Syntax Description

vrf vrf-name	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
ip-address-name	(Optional) Can be either one of the following: - Name of the multicast group, as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 or domain IPv6 host command. - IP address of the multicast group, in IPv4 or IPv6 format according to the specified address family.
reset	(Optional) Deletes all entries from the topology table and resets the MRIB connection.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear pim topology** command clears existing PIM routes from the PIM topology table. Information obtained from the MRIB table, such as Internet Group Management Protocol (IGMP) local membership, is retained. If a multicast group is specified, only those group entries are cleared.

When the command is used with no arguments, all group entries located in the PIM topology table are cleared of PIM protocol information.

If the **reset** keyword is specified, all information from the topology table is cleared and the MRIB connections are automatically reset. This form of the command can be used to synchronize state between the PIM topology

table and the MRIB database. The **reset** keyword should be strictly reserved to force synchronized PIM and MRIB entries when communication between the two components is malfunctioning.

If you do not explicitly specify a particular VRF, the default VRF is used.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to clear the PIM topology table:

```
RP/0/RSP0/CPU0:router# clear pim topology
```

dr-priority

To configure the designated router (DR) priority on a Protocol Independent Multicast (PIM) router, use the **dr-priority** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

dr-priority *value*
no dr-priority

Syntax Description	<i>value</i>	An integer value to represent DR priority. Range is from 0 to 4294967295.

Command Default	If this command is not specified in interface configuration mode, the interface adopts the DR priority value specified in PIM configuration mode. If this command is not specified in PIM configuration mode, the DR priority value is 1.	

Command Modes	PIM interface configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	
	If all the routers on the LAN support the DR priority option in the PIM Version 2 (PIMv2) hello message that they send, you can force the DR election by use of the dr-priority command so that a specific router on the subnet is elected as DR. The router with the highest DR priority becomes the DR.	
	When PIMv2 routers receive a hello message without the DR priority option (or when the message has priority of 0), the receiver knows that the sender of the hello message does not support DR priority and that DR election on the LAN segment should be based on IP address alone.	



Note

If this command is configured in PIM configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces from PIM interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the router to use DR priority 4 for Packet-over-SONET/SDH (POS) interface 0/1/0/0, but other interfaces will inherit DR priority 2:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# dr-priority 2  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# interface pos 0/1/0/0  
RP/0/RSP0/CPU0:router(config-pim-ipv4-if)# dr-priority 4
```

global maximum

To configure the global maximum limit states that are allowed by Protocol Independent Multicast (PIM) for all VRFs, use the **global maximum** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

global maximum [**register states**| **route-interfaces**| **routes** *number*]

no global maximum [**register states**| **route-interfaces**| **routes**]

Syntax Description

register states	(Optional) Specifies the PIM source register states for all VRFs. Range is 0 to 75000.
route-interfaces	(Optional) Specifies the total number of PIM interfaces on routes for all VRFs. Range is 1 to 600000.
routes	(Optional) Specifies the PIM routes for all VRFs. Range is 1 to 200000.

Command Default

No default value.

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **global maximum** command is used to set an upper limit for register states, route interfaces, and routes on all VRFs. When the limit is reached, PIM discontinues route interface creation for its topology table.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set the upper limit for PIM route interfaces on all VRFs to 200000:

```
RP/0/RSP0/CPU0:router# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# global maximum route-interfaces 200000
```

hello-interval (PIM)

To configure the frequency of Protocol Independent Multicast (PIM) hello messages, use the **hello-interval** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

hello-interval *seconds*
no hello-interval

Syntax Description	<i>seconds</i> Interval at which PIM hello messages are sent. Range is 1 to 3600.

Command Default	Default is 30 seconds.

Command Modes	PIM interface configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Routers configured for IP multicast send PIM hello messages to establish PIM neighbor adjacencies and to determine which router is the designated router (DR) for each LAN segment (subnet).

To establish these adjacencies, at every hello period, a PIM multicast router multicasts a PIM router-query message to the All-PIM-Routers (224.0.0.13) multicast address on each of its multicast-enabled interfaces.

PIM hello messages contain a hold-time value that tells the receiver when the neighbor adjacency associated with the sender should expire if no further PIM hello messages are received. Typically the value of the hold-time field is 3.5 times the interval time value, or 120 seconds if the interval time is 30 seconds.

Use the **show pim neighbor** command to display PIM neighbor adjacencies and elected DRs.



Note If you configure the **hello-interval** command in PIM configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces from PIM interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure the PIM hello message interval to 45 seconds. This setting is adopted by all interfaces excluding the 60 second interval time set for Packet-over-SONET/SDH (POS) interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# hello-interval 45  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# interface pos 0/1/0/0  
RP/0/RSP0/CPU0:router(config-pim-ipv4-if)# hello-interval 60
```

Related Commands

Command	Description
dr-priority, on page 414	Configures the designated router (DR) priority on a Protocol Independent Multicast (PIM) router.
show pim neighbor, on page 463	Displays the Protocol Independent Multicast (PIM) neighbors discovered by means of PIM hello messages.

interface (PIM)

To configure Protocol Independent Multicast (PIM) interface properties, use the **interface** command in PIM configuration mode. To disable multicast routing on an interface, use the **no** form of this command.

```
interface type interface-path-id
no interface type interface-path-id
```

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to configure PIM routing properties for specific interfaces. Specifically, this command can be used to override the global settings for the following commands:

- dr-priority
- hello-interval
- join-prune-interval

Use the **interface** command also to enter PIM interface configuration mode.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enter interface configuration mode to configure PIM routing properties for specific interfaces:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# interface pos 0/1/0/0  
RP/0/RSP0/CPU0:router  
/CPU0:router(config-pim-ipv4-if)#
```

Related Commands

Command	Description
dr-priority, on page 414	Configures the designated router (DR) priority on a Protocol Independent Multicast (PIM) router.
hello-interval (PIM), on page 418	Configures the frequency of Protocol Independent Multicast (PIM) hello messages.
join-prune-interval, on page 422	Configures the join and prune interval time for Protocol Independent Multicast (PIM) protocol traffic.

join-prune-interval

To configure the join and prune interval time for Protocol Independent Multicast (PIM) protocol traffic, use the **join-prune-interval** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

join-prune-interval *seconds*
no join-prune-interval

Syntax Description	<i>seconds</i>	Interval, in seconds, at which PIM multicast traffic can join or be removed from the shortest path tree (SPT) or rendezvous point tree (RPT). Range is 10 to 600.

Command Default	If this command is not specified in PIM interface configuration mode, the interface adopts the join and prune interval parameter specified in PIM configuration mode. If this command is not specified in PIM configuration mode, the join and prune interval is 60 seconds.	

Command Modes	PIM interface configuration PIM configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.	



Note

If this command is configured in PIM configuration mode, parameters are inherited by all new and existing interfaces. You can override these parameters on individual interfaces from PIM interface configuration mode.

The **join-prune-interval** command is used to configure the frequency at which a PIM sparse-mode router sends periodic join and prune messages.

Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to change the join and prune interval time to 90 seconds on Packet-over-SONET/SDH (POS) interface 0/1/0/0:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# interface pos 0/1/0/0  
RP/0/RSP0/CPU0:router(config-pim-ipv4-if)# join-prune-interval 90
```

maximum register-states

To configure the maximum number of sparse-mode source register states that is allowed by Protocol Independent Multicast (PIM), use the **maximum register-states** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

maximum register-states *number*

no maximum register-states

Syntax Description	<i>number</i>	Maximum number of PIM sparse-mode source register states. Range is 0 to 75000.

Command Default	<i>number</i> : 20000

Command Modes	PIM configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **maximum register-states** command is used to set an upper limit for PIM register states. When the limit is reached, PIM discontinues route creation from PIM register messages.

Task ID	Task ID	Operations
	multicast	read, write

Examples	The following example shows how to set the upper limit for PIM register states to 10000:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# maximum register-states 10000
```

Related Commands

Command	Description
show pim summary , on page 480	Displays configured Protocol Independent Multicast (PIM) out-of-resource (OOR) limits and current counts.

maximum route-interfaces

To configure the maximum number of route interface states that is allowed by Protocol Independent Multicast (PIM), use the **maximum route-interfaces** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

maximum route-interfaces *number*

no maximum route-interfaces

Syntax Description	<i>number</i> Maximum number of PIM route interface states. Range is 1 to 600000.	
Command Default	<i>number</i> : 30000	
Command Modes	PIM configuration	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. The maximum route-interfaces command is used to set an upper limit for route interface states. When the limit is reached, PIM discontinues route interface creation for its topology table.	
Task ID	Task ID	Operations
	multicast	read, write

Examples

The following example shows how to set the upper limit for PIM route interface states to 200000:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# maximum route-interfaces 200000
```

Related Commands

Command	Description
show pim summary , on page 480	Displays configured Protocol Independent Multicast (PIM) out-of-resource (OOR) limits and current counts.

maximum routes

To configure the maximum number of routes that is allowed by Protocol Independent Multicast (PIM), use the **maximum routes** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

maximum routes *number*

no maximum routes

Syntax Description	<i>number</i>	Maximum number of PIM routes. Range is 1 to 200000.

Command Default	<i>number</i> : 100000

Command Modes	PIM configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. The maximum routes command is used to set an upper limit for PIM routes. When the limit is reached, PIM discontinues route creation for its topology table.

Task ID	Task ID	Operations
	multicast	read, write

Examples	The following example shows how to set the upper limit for PIM routes to 200000:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# maximum routes 200000
```


Related Commands

Command	Description
show pim summary, on page 480	Displays configured Protocol Independent Multicast (PIM) out-of-resource (OOR) limits and current counts.

mofrr

To perform a fast convergence (multicast-only fast reroute, or MoFRR) of specified routes/flows when a failure is detected on one of multiple equal-cost paths between the router and the source, use the **mofrr** command under PIM address-family IPv4 configuration submenu

```
mofrr acl_name
no mofrr acl_name
```

Syntax Description	acl_name	Specifies the flows (S, G) s to be enabled by MoFRR.

Command Default	MoFRR is not enabled by default. If no VRF is specified, the default VRF is operational.

Command Modes	PIM vrf configuration PIM address-family IPv4 configuration

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

MoFRR is a mechanism in which two copies of the same multicast stream flow through disjoint paths in the network. At the point in the network (usually the PE closer to the receivers) where the two streams merge, one of the streams is accepted and forwarded on the downstream links, while the other stream is discarded. When a failure is detected in the primary stream due to a link or node failure in the network, MoFRR instructs the forwarding plane to start accepting packets from the backup stream (which now becomes the primary stream) .

MoFRR is triggered when the hardware detects traffic loss on the primary path of a given flow or route. Traffic loss is defined as no data packet having been received for 30 ms. When MoFRR is triggered, the primary and secondary reverse-path forwarding (RPF) interfaces are exposed to the forwarding plane and switchover occurs entirely at the hardware level.



Note MoFRR supports all ECMP hashing algorithms except the source-only hash algorithm. The secondary path is chosen by running the same algorithm on the set of paths that does not include the primary path.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure MoFRR:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim)# mofrr rib acl-green

RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim)# address-family ipv4
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# mofrr acl-green
```

Related Commands

Command	Description
show mfib counter	Displays Multicast Forwarding Information Base (MFIB) counter statistics for packets that have dropped.
show mfib route	Displays route entries in the MFIB.
show mrrib route	Displays all entries in the Multicast Routing Information Base (MRIB).
show pim rpf hash, on page 472	Displays MoFRR hashing information for Routing Information Base (RIB) lookups used to predict RPF next-hop paths for routing tables in PIM.
show pim rpf summary, on page 478	Displays summary information about the interaction of PIM with the RIB.
show pim topology detail, on page 489	Displays detailed PIM routing topology information that includes references to the tables in which reverse path forwarding (RPF) lookups occurred for specific topology route entries.
show pim topology, on page 482	Displays PIM routing topology table information for a specific group or all groups.

neighbor-check-on-recv enable

To block the receipt of join and prune messages from non-Protocol Independent Multicast (PIM) neighbors, use the **neighbor-check-on-recv enable** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

neighbor-check-on-recv enable

no neighbor-check-on-recv enable

Syntax Description

This command has no keywords or arguments.

Command Default

Join and prune messages that are sent from non-PIM neighbors are received and not rejected.

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable PIM neighbor checking on received join and prune messages:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# neighbor-check-on-recv enable
```

Related Commands

Command	Description
neighbor-check-on-send enable , on page 433	Enables Protocol Independent Multicast (PIM) neighbor checking when sending join and prune messages.

neighbor-check-on-send enable

To enable Protocol Independent Multicast (PIM) neighbor checking when sending join and prune messages, use the **neighbor-check-on-send enable** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

neighbor-check-on-send enable

no neighbor-check-on-send enable

Syntax Description This command has no keywords or arguments.

Command Default Join and prune messages are sent to non-PIM neighbors.

Command Modes PIM configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Operations
multicast	read, write

Examples The following example shows how to enable PIM neighbor checking when sending join and prune messages:

```
RP/0/RSP0/CPU0:router# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# neighbor-check-on-send enable
```

Command	Description
neighbor-check-on-recv enable , on page 432	Blocks the receipt of join and prune messages from non-Protocol Independent Multicast (PIM) neighbors.

neighbor-filter

To filter Protocol Independent Multicast (PIM) neighbor messages from specific IP addresses, use the **neighbor-filter** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

neighbor-filter *access-list*

no neighbor-filter

Syntax Description

<i>access-list</i>	Number or name of a standard IP access list that denies PIM packets from a source.

Command Default

PIM neighbor messages are not filtered.

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **neighbor-filter** command is used to prevent unauthorized routers on the LAN from becoming PIM neighbors. Hello messages from addresses specified in the command are ignored.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure PIM to ignore all hello messages from IP address 10.0.0.1:

```
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# neighbor-filter 1
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# exit
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 1
RP/0/RSP0/CPU0:router(config-ipv4-acl)# deny ipv4 any 10.0.0.1/24
```

nsf lifetime (PIM)

To configure the nonstop forwarding (NSF) timeout value for the Protocol Independent Multicast (PIM) process, use the **nsf lifetime** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

nsf lifetime *seconds*

no nsf lifetime

Syntax Description

<i>seconds</i>	Maximum time for NSF mode in seconds. Range is 10 to 600.

Command Default

seconds : 120

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

While in PIM NSF mode, PIM is recovering multicast routing topology from the network and updating the Multicast Routing Information Base (MRIB). After the PIM NSF timeout value is reached, PIM signals the MRIB and resumes normal operation.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following command shows how to set the PIM NSF timeout value to 30 seconds:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# nsf lifetime 30
```

Related Commands

Command	Description
nsf (multicast)	Turns on NSF capability for the multicast routing system.
show igmp nsf	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.
show mrrib nsf	Displays the state of NSF operation in the MRIB.
show pim nsf , on page 466	Displays the state of NSF operation for PIM.

old-register-checksum

To configure a Cisco IOS XR designated router (DRs) in a network where the rendezvous point is running an older version of Cisco IOS software, use the **old-register-checksum** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

old-register-checksum

no old-register-checksum

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes PIM configuration

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Cisco IOS XR software accepts register messages with checksum on the Protocol Independent Multicast (PIM) header and the next 4 bytes only. This differs from the Cisco IOS method that accepts register messages with the entire PIM message for all PIM message types. The **old-register-checksum** command generates and accepts registers compatible with Cisco IOS software. This command is provided entirely for backward compatibility with Cisco IOS implementations.



Note To allow interoperability with Cisco IOS rendezvous points running older software, run this command on all DRs in your network running Cisco IOS XR software. Cisco IOS XR register messages are incompatible with Cisco IOS software.

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set a source designated router (DR) to generate a register compatible with an earlier version of Cisco IOS XR PIM rendezvous point:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# old-register-checksum
```

router pim

To enter Protocol Independent Multicast (PIM) configuration mode, use the **router pim** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

router pim [address family {ipv4| ipv6}]

no router pim [address family {ipv4| ipv6}]

Syntax Description

address-family	(Optional) Specifies which address prefixes to use.
ipv4	(Optional) Specifies IPv4 address prefixes.
ipv6	(Optional) Specifies IPv6 address prefixes.

Command Default

The default is IPv4 address prefixes.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.2.0	The ipv6 keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

From PIM configuration mode, you can configure the address of a rendezvous point (RP) for a particular group, configure the nonstop forwarding (NSF) timeout value for the PIM process, and so on.

Task ID

Task ID	Operations
multicast	read, write

Examples

This example shows how to enter PIM configuration mode for IPv4 address prefixes:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)#
```

This example shows how to enter PIM configuration mode for IPv4 address prefixes and specify the **address-family ipv6** keywords:

```
RP/0/RSP0/CPU0:router(config)# router pim address-family ipv4  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)#  
  
RP/0/RSP0/CPU0:router(config)# pim address-family ipv6  
RP/0/RSP0/CPU0:router(config-pim-default-ipv6)#
```

rp-address

To statically configure the address of a Protocol Independent Multicast (PIM) rendezvous point (RP) for a particular group, use the **rp-address** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

rp-address *ip-address* [*group-access-list*] [**override**]

no rp-address *ip-address* [*group-access-list*] [**override**]

Syntax Description

<i>ip-address</i>	IP address of a router to be a PIM rendezvous point. This address is a unicast IP address in four-part dotted-decimal notation.
<i>group-access-list</i>	(Optional) Name of an access list that defines for which multicast groups the rendezvous point should be used. This list is a standard IP access list.
override	(Optional) Indicates that if there is a conflict, the rendezvous point configured with this command prevails over the rendezvous point learned through the auto rendezvous point (Auto-RP) or BSR mechanism.

Command Default

No PIM rendezvous points are preconfigured.

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All routers within a common PIM sparse mode (PIM-SM) require the knowledge of the well-known PIM rendezvous point address. The address is learned through Auto-RP, BSR, or is statically configured using this command.

If the optional *group-access-list-number* argument is not specified, the rendezvous point for the group is applied to the entire IP multicast group range (224.0.0.0/4).

You can configure a single rendezvous point to serve more than one group. The group range specified in the access list determines the PIM rendezvous point group mapping. If no access list is specified, the rendezvous point default maps to 224/4.

If the rendezvous point for a group is learned through a dynamic mechanism, such as Auto-RP, this command might not be required. If there is a conflict between the rendezvous point configured with this command and one learned by Auto-RP, the Auto-RP information is used unless the **override** keyword is specified.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to set the PIM rendezvous point address to 10.0.0.1 for all multicast groups:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# rp-address 10.0.0.1
The following example shows how to set the PIM rendezvous point address to 172.16.6.21 for groups 225.2.2.0 - 225.2.2.255:
```

```
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 1
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any 225.2.2.0 0.0.0.255
RP/0/RSP0/CPU0:router(config-ipv4-acl)# exit
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-ipv4)# rp-address 172.16.6.21
RP/0/RSP0/CPU0:router(config-pim-ipv4)#
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# rp-address 172.16.6.21
```

Related Commands

Command	Description
ipv4 access-list	Defines a standard IP access list. For more information, see <i>Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference</i>

rpf topology route-policy

To assign a route policy in PIM to select a reverse-path forwarding (RPF) topology, use the **rpf topology route-policy** command in PIM command mode. To disable this configuration, use the **no** form of this command.

rpf topology route-policy *policy-name*

no rpf topology route-policy *policy-name*

Syntax Description

<i>policy-name</i>	(Required) Name of the specific route policy that you want PIM to associate with a reverse-path forwarding topology.

Command Default

No default behavior or values

Command Modes

PIM configuration
PIM address-family configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For information about routing policy commands and how to create a routing policy, see *Cisco ASR 9000 Series Aggregation Services Router Routing Command Reference* and *Cisco ASR 9000 Series Aggregation Services Router Routing Configuration Guide*.

To assign a route policy using an IPv6 address family prefix, you must enter the command as shown in the Examples section.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following examples show how to associate a specific routing policy in PIM with a RPF topology table for IPv4 address family prefixes:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# rpf topology route-policy mypolicy  
RP/0/RSP0/CPU0:router(config)# router pim address-family ipv6  
RP/0/RSP0/CPU0:router(config-pim-default-ipv6)# rpf topology route-policy mypolicy
```


rpf-vector

To enable Reverse Path Forwarding (RPF) vector signaling for Protocol Independent Multicast (PIM), use the **rpf-vector** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

rpf-vector

no rpf-vector

Syntax Description

This command has no keywords or arguments.

Command Default

By default, RPF vector signaling is disabled.

Command Modes

PIM configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

RPF vector is a PIM proxy that lets core routers without RPF information forward join and prune messages for external sources (for example, a Multiprotocol Label Switching [MPLS]-based BGP-free core, where the MPLS core router is without external routes learned from Border Gateway Protocol [BGP]).

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enable RPF vector:

```
RP/0/RSP0/CPU0:router(config)# router pim  
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# rpf-vector
```

rp-static-deny

To configure the deny range of the static Protocol Independent Multicast (PIM) rendezvous point (RP), use the **rp-static-deny** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

rp-static-deny *access-list*

no rp-static-deny

Syntax Description	
<i>access-list</i>	Name of an access list. This list is a standard IP access list.

Command Default	No default behavior or values

Command Modes	PIM configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read, write

Examples	The following example shows how to configure the PIM RP deny range:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# rp-static-deny listA
```

Related Commands	Command	Description
	ipv4 access-list	Defines a standard IP access list.

show auto-rp candidate-rp

To display the group ranges that this router represents (advertises) as a candidate rendezvous point (RP), use the **show auto-rp candidate-rp** command in EXEC mode.

show auto-rp [ipv4] candidate-rp

Syntax Description	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default	IPv4 addressing is the default.

Command Modes	EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show auto-rp candidate-rp** command displays all the candidate rendezvous points configured on this router.

Information that is displayed is the time-to-live (TTL) value; the interval from which the rendezvous point announcements were sent; and the mode, such as Protocol Independent Multicast (PIM) sparse mode (SM), to which the rendezvous point belongs.

Task ID	Task ID	Operations
	multicast	read

Examples

The following is sample output from the **show auto-rp candidate-rp** command:

```
RP/0/RSP0/CPU0:router# show auto-rp candidate-rp
```

Group	Range	Mode	Candidate RP	ttl	interval
224.0.0.0/4		SM	10.0.0.6	30	30

This table describes the significant fields shown in the display.

Table 30: show auto-rp candidate-rp Field Descriptions

Field	Description
Group Range	Multicast group address and prefix for which this router is advertised as a rendezvous point.
Mode	PIM protocol mode for which this router is advertised as a rendezvous point , either PIM-SM or bidirectional PIM (bidir).
Candidate RP	Address of the interface serving as a rendezvous point for the range.
ttl	TTL scope value (in router hops) for Auto-RP candidate announcement messages sent out from this candidate rendezvous point interface.
interval	Time between candidate rendezvous point announcement messages for this candidate rendezvous point interface.

show pim context

To show the reverse path forwarding (RPF) table information configured for a VRF context, use the **show pim context** command in EXEC mode.

show pim [**vrf** *vrf-name*] [**ipv4**] **context**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following example illustrates output from use of the **show pim context** command:

```
RP/0/RSP0/CPU0:router# show pim context

VRF ID: 0x60000000
Table ID: 0xe0000000
Remote Table ID: 0xe0800000
MDT Default Group : 0.0.0.0
MDT handle: 0x0
Context Active, ITAL Active
Routing Enabled
Registered with MRIB
Not owner of MDT Interface
Raw socket req: T, act: T, LPTS filter req: T, act: T
UDP socket req: T, act: T, UDP vbind req: T, act: T
```

show pim context

```

Reg Inj socket req: F, act: F, Reg Inj LPTS filter req: F, act: F
Mhost Default Interface : Null (publish pending: F)
Remote MDT Default Group : 0.0.0.0
Neighbor-filter: -

```

The following table gives the field descriptions for the **show pim context** command output:

Table 31: show pim context Field Descriptions

Field	Description
VRF ID	VPN routing and forwarding instance identification.
Table ID	Identification of unicast default table as of VRF context activation.
Remote Table ID	Identifies the table ID of the opposite address family. For example, the remote table ID for the VRF context of the
MDT Default Group	Identifies the multicast distribution tree (MDT) group configured as the default for use by the VRF.
MDT handle	Identifies the handle for multicast packets to be passed through the MDT interface.
Context Active	Identifies whether or not the VRF context was activated.
ITAL Active	Identifies whether or not the VRF is registered with ITAL. If it is, this signifies that the VRF is configured globally.
Routing Enabled	Identifies whether or not PIM is enabled in the VRF.
Registered with MRIB	Identifies whether or not the VRF is registered with Multicast Routing Information Base (MRIB).
Not owner of MDT interface	Identifies a process as not being the owner of the MDT interface. The owner is either the PIM or the PIM IPv6 process.
Owner of MDT interface	Identifies the owner of the MDT interface. The owner is either the PIM or the PIM IPv6 process.
Raw socket req:	Raw socket operations requested.
act:	Action: Indicates whether or not the operations were performed.

Field	Description
T; F	True; False
LPTS filter req	Identifies whether or not the VRF was requested to be added to the socket.
UDP socket req	Identifies whether or not a UDP socket was requested.
UDP vbind req	Identifies whether or not the VRF was added to the UDP socket.
Reg Inj socket req	This Boolean indicates whether or not the register inject socket, used for PIM register messages, was requested.
Reg Inj LPTS filter req	Indicates whether or not the VRF was added to the register inject socket.
Mhost Default Interface	Identifies the default interface to be used for multicast host (Mhost).
Remote MDT Default Group	Identifies the MDT transiting this VRF or address family in use by the remote address family.
Neighbor-filter	Name of the neighbor filter used to filter joins or prunes from neighbors. If there is no neighbor filter, the output reads: "-".

show pim context table

To display a summary list of all tables currently configured for a VRF context, use the **show pim context table** command in EXEC mode.

show pim [vrf vrf-name] [ipv4] context table

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read

Examples The following example illustrates the output for PIM table contexts for a VRF default after using the **show pim context table** command:

RP/0/ RSP0 /CPU0:router# **show pim ipv4 context table**

```
PIM Table contexts for VRF default

Table                               TableID      Status
IPv4-Unicast-default                0xe0000000  Active
IPv4-Multicast-default               0xe0100000  Active
IPv4-Multicast-t201                  0xe010000b  Active
IPv4-Multicast-t202                  0xe010000c  Active
IPv4-Multicast-t203                  0xe010000d  Active
IPv4-Multicast-t204                  0xe010000e  Active
```



```

IPv4-Multicast-t205      0xe010000f    Active
IPv4-Multicast-t206      0xe0100010    Active
IPv4-Multicast-t207      0xe0100011    Active
IPv4-Multicast-t208      0x00000000    Inactive
IPv4-Multicast-t209      0x00000000    Inactive
IPv4-Multicast-t210      0x00000000    Inactive

```

Table 32: show pim ipv4 context table Field Descriptions

Field	Description
Table	Context table name.
Table ID	RSI table ID for the table.
Status	Identifies whether or not the context table is active or inactive. The table displays “Active” if it was globally configured under a given VRF, and if RSI considers it to be active. The table displays “Inactive” if the opposite is true.

show pim group-map

To display group-to-PIM mode mapping, use the **show pim group-map** command in EXEC mode.

show pim [*vrf vrf-name*] [**ipv4**] **group-map** [*ip-address-name*] [**info-source**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>ip-address-name</i>	(Optional) IP address name as defined in the Domain Name System (DNS) hosts table or with the domain ipv4 host in the format <i>A.B.C.D</i> .
info-source	(Optional) Displays the group range information source.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim group-map** command displays all group protocol address mappings for the rendezvous point. Mappings are learned from different clients or through the auto rendezvous point (Auto-RP) mechanism.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim group-map** command:

```
RP/0/RSP0/CPU0:router# show pim group-map

IP PIM Group Mapping Table
(* indicates group mappings being used)
```

(+ indicates BSR group mappings active in MRIB)

Group Range	Proto	Client	Groups	RP address	Info
224.0.1.39/32*	DM	perm	1	0.0.0.0	
224.0.1.40/32*	DM	perm	1	0.0.0.0	
224.0.0.0/24*	NO	perm	0	0.0.0.0	
232.0.0.0/8*	SSM	config	0	0.0.0.0	
224.0.0.0/4*	SM	autorp	1	10.10.2.2	RPF: POS01/0/3,10.10.3.2
224.0.0.0/4	SM	static	0	0.0.0.0	RPF: Null,0.0.0.0

In lines 1 and 2, Auto-RP group ranges are specifically denied from the sparse mode group range.

In line 3, link-local multicast groups (224.0.0.0 to 224.0.0.255 as defined by 224.0.0.0/24) are also denied from the sparse mode group range.

In line 4, the Protocol Independent Multicast (PIM) Source Specific Multicast (PIM-SSM) group range is mapped to 232.0.0.0/8.

Line 5 shows that all the remaining groups are in sparse mode mapped to rendezvous point 10.10.3.2.

This table describes the significant fields shown in the display.

Table 33: show pim group-map Field Descriptions

Field	Description
Group Range	Multicast group range that is mapped.
Proto	Multicast forwarding mode.
Client	States how the client was learned.
Groups	Number of groups from the PIM topology table.
RP address	Rendezvous point address.
Info	RPF interface used and the PIM-SM Reverse Path Forwarding (RPF) information toward the rendezvous point.

Related Commands

Command	Description
domain ipv4 host	Defines a static hostname-to-address mapping in the host cache using IPv4. For more information, see <i>Cisco ASR 9000 Series Aggregation Services Router IP Addresses and Services Command Reference</i>
rp-address, on page 441	Configures the address of a PIM rendezvous point for a particular group.
show pim range-list, on page 468	Displays the range-list information for PIM.

show pim interface

To display information about interfaces configured for Protocol Independent Multicast (PIM), use the **show pim interface** command in EXEC mode.

```
show pim [vrf vrf-name] [ipv4] interface [type interface-path-id] state-on| state-off] [detail]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
state-on	(Optional) Displays only interfaces from which PIM is enabled and active.
state-off	(Optional) Displays only interfaces from which PIM is disabled or inactive.
detail	(Optional) Displays detailed address information.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim interface** command displays neighboring information on all PIM-enabled interfaces, such as designated router (DR) priority and DR election winner.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim interface** command:

```
RP/0/RSP0/CPU0:router# show pim interface
```

Address	Interface	PIM	Nbr Count	Hello Intvl	DR Prior	DR
172.29.52.127	MgmtEth0/0/CPU0/0	off	0	30	1	not elected
10.6.6.6	Loopback0	off	0	30	1	not elected
0.0.0.0	Loopback60	off	0	30	1	not elected
0.0.0.0	Loopback61	off	0	30	1	not elected
10.46.4.6	ATM0/2/0/0.1	off	0	30	1	not elected
10.46.5.6	ATM0/2/0/0.2	off	0	30	1	not elected
10.46.6.6	ATM0/2/0/0.3	off	0	30	1	not elected
10.46.7.6	ATM0/2/0/0.4	off	0	30	1	not elected
10.46.8.6	ATM0/2/0/3.1	off	0	30	1	not elected
10.46.9.6	ATM0/2/0/3.2	off	0	30	1	not elected
10.56.16.6	Serial0/3/2/1	off	0	30	1	not elected
10.56.4.2	Serial0/3/0/0/0:0	off	0	30	1	not elected
10.56.4.6	Serial0/3/0/0/1:0	off	0	30	1	not elected
10.56.4.10	Serial0/3/0/0/2:0	off	0	30	1	not elected
10.56.4.14	Serial0/3/0/0/2:1	off	0	30	1	not elected
10.56.4.18	Serial0/3/0/0/3:0	off	0	30	1	not elected
10.56.4.22	Serial0/3/0/0/3:1	off	0	30	1	not elected
10.56.4.26	Serial0/3/0/0/3:2	off	0	30	1	not elected
10.56.4.30	Serial0/3/0/0/3:3	off	0	30	1	not elected
10.56.8.2	Serial0/3/0/1/0:0	off	0	30	1	not elected
10.56.12.6	Serial0/3/2/0.1	off	0	30	1	not elected
10.56.13.6	Serial0/3/2/0.2	off	0	30	1	not elected
10.56.14.6	Serial0/3/2/0.3	off	0	30	1	not elected
10.56.15.6	Serial0/3/2/0.4	off	0	30	1	not elected
10.67.4.6	POS0/4/1/0	off	0	30	1	not elected
10.67.8.6	POS0/4/1/1	off	0	30	1	not elected

This table describes the significant fields shown in the display.

Table 34: show pim interface Field Descriptions

Field	Description
Address	IP address of the interface.
Interface	Interface type and number that is configured to run PIM.
PIM	PIM is turned off or turned on this interface.
Nbr Count	Number of PIM neighbors in the neighbor table for the interface.
Hello Intvl	Frequency, in seconds, of PIM hello messages, as set by the ip pim hello-interval command in interface configuration mode.

show pim interface

Field	Description
DR Priority	Designated router priority is advertised by the neighbor in its hello messages.
DR	IP address of the DR on the LAN. Note that serial lines do not have DRs, so the IP address is shown as 0.0.0.0. If the interface on this router is the DR, “this system” is indicated; otherwise, the IP address of the external neighbor is given.

Related Commands

Command	Description
show pim neighbor, on page 463	Displays the Protocol Independent Multicast (PIM) neighbors discovered by means of PIM hello messages.

show pim join-prune statistic

To display Protocol Independent Multicast (PIM) join and prune aggregation statistics, use the **show pim join-prune statistics** command in EXEC mode.

show pim [**vrf** *vrf-name*] [**ipv4**] **join-prune statistic** [*type interface-path-id*]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

IP addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim join-prune statistics** command displays the average PIM join and prune groups for the most recent packets (in increments of 1000/10000/50000) that either were sent out or received from each PIM interface. If fewer than 1000/10000/50000 join and prune group messages are received since PIM was started or the statistics were cleared, the join-prune aggregation shown in the command display is zero (0).

Because each PIM join and prune packet can contain multiple groups, this command can provide a snapshot view of the average pace based on the number of join and prune packets, and on the consideration of the aggregation factor of each join and prune packet.

show pim join-prune statistic

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim join-prune statistics** command with all router interfaces specified:

```
RP/0/RSP0/CPU0:router# show pim join-prune statistics

PIM Average Join/Prune Aggregation for last (100/1K/10K) packets
Interface      MTU      Transmitted    Received
Loopback0      1514     0 / 0 / 0      0 / 0 / 0
Encapstunnel0  0        0 / 0 / 0      0 / 0 / 0
Decapstunnel0  0        0 / 0 / 0      0 / 0 / 0
Loopback1      1514     0 / 0 / 0      0 / 0 / 0
POS0/3/0/0     4470     0 / 0 / 0      0 / 0 / 0
POS0/3/0/3     4470     0 / 0 / 0      0 / 0 / 0
```

This table describes the significant fields shown in the display.

Table 35: show pim join-prune statistics Field Descriptions

Field	Description
Interface	Interface from which statistics were collected.
MTU	Maximum transmission unit (MTU) in bytes for the interface.
Transmitted	Number of join and prune states aggregated into transmitted messages in the last 1000/10000/50000 transmitted join and prune messages.
Received	Number of join and prune states aggregated into received messages in the last 1000/10000/50000 received join and prune messages.

show pim mstatic

To display multicast static routing information, use the **show pim mstatic** command in EXEC mode.

show pim [ipv4] mstatic [ipv4]

Syntax Description	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default	IPv4 addressing is the default.

Command Modes	EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim mstatic** command is used to view all the multicast static routes. Multicast static routes are defined by the **static-rpf** command.

Task ID	Task ID	Operations
	multicast	read

Examples

The following is sample output from the **show pim mstatic** command that shows how to reach IP address 10.0.0.1:

```
RP/0/RSP0/CPU0:router# show pim mstatic
```

```
IP Multicast Static Routes Information
* 10.0.0.1/32 via pos0/1/0/1 with nexthop 172.16.0.1 and distance 0
This table describes the significant fields shown in the display.
```

Table 36: show pim mstatic Field Descriptions

Field	Description
10.0.0.1	Destination IP address.
pos0/1/0/1	Interface that is entered to reach destination IP address 10.0.0.1
172.16.0.1	Next-hop IP address to enter to reach destination address 10.0.0.1.
0	Distance of this mstatic route.

Related Commands

Command	Description
static-rpf	Configures a static Reverse Path Forwarding (RPF) rule for a specified prefix mask.

show pim neighbor

To display the Protocol Independent Multicast (PIM) neighbors discovered by means of PIM hello messages, use the **show pim neighbor** command in EXEC mode.

show pim [**vrf** *vrf-name*] [**ipv4**] **neighbor** [*type interface-path-id*] [**count**|**detail**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
count	(Optional) Number of neighbors present on the specified interface, or on all interfaces if one is not specified. The interface on this router counts as one neighbor in the total count.
detail	(Optional) Displays detailed information.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

show pim neighbor**Task ID**

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim neighbor** command:

```
RP/0/RSP0/CPU0:router# show pim neighbor
```

```
Neighbor Address   Interface          Uptime    Expires DR pri Bidir
172.17.1.2*        Loopback1          03:41:22  00:01:43 1 (DR) B
172.17.2.2*        Loopback2          03:41:20  00:01:31 1 (DR) B
172.17.3.2*        Loopback3          03:41:18  00:01:28 1 (DR) B
10.10.1.1          POS0/2/0/0         03:40:36  00:01:41 1      B
10.10.1.2*        POS0/2/0/0         03:41:28  00:01:32 1 (DR) B
10.10.2.2*        POS0/2/0/2         03:41:26  00:01:36 1      B
10.10.2.3          POS0/2/0/2         03:41:25  00:01:29 1 (DR) B
PIM neighbors in VRF default
```

```
Neighbor Address   Interface          Uptime    Expires DR pri
Flags
10.6.6.6*          Loopback0          4w1d      00:01:24 1 (DR) B
10.16.8.1          GigabitEthernet0/4/0/2 3w2d      00:01:24 1      B
10.16.8.6*        GigabitEthernet0/4/0/2 3w2d      00:01:28 1 (DR) B
192.168.66.6*     GigabitEthernet0/4/0/0.7 4w1d      00:01:28 1 (DR)
B P
192.168.67.6*     GigabitEthernet0/4/0/0.8 4w1d      00:01:40 1 (DR)
B P
192.168.68.6*     GigabitEthernet0/4/0/0.9 4w1d      00:01:24 1 (DR)
B P
```

PIM neighbors in VRF default

```
Neighbor Address   Interface          Uptime    Expires DR pri Flags
28.28.9.2*        GigabitEthernet0/2/0/9 00:39:34  00:01:40 1 (DR) B A
10.1.1.1          GigabitEthernet0/2/0/19 00:49:30  00:01:42 1      B A
10.1.1.2*        GigabitEthernet0/2/0/19 00:50:01  00:01:41 1 (DR) B A
2.2.2.2*          Loopback0          00:50:01  00:01:42 1 (DR) B A
```

The following is sample output from the **show pim neighbor** command with the **count** option:

```
RP/0/RSP0/CPU0:router# show pim neighbor count
```

```
Interface  Nbr count
POS0/3/0/0 1
Loopback1 1
Total Nbrs 2
```

This table describes the significant fields shown in the display.

Table 37: show pim neighbor Field Descriptions

Field	Description
Neighbor Address	IP address of the PIM neighbor.
Interface	Interface type and number on which the neighbor is reachable.

Field	Description
Uptime	Time the entry has been in the PIM neighbor table.
Expires	Time until the entry is removed from the IP multicast routing table.
DR pri	DR priority sent by the neighbor in its hello messages. If this neighbor is elected as the DR on the interface, it is annotated with “(DR)” in the command display.
Nbr count	Number of PIM neighbors in the neighbor table for all interfaces on this router.

Related Commands

Command	Description
show pim interface, on page 456	Displays information about interfaces configured for Protocol Independent Multicast (PIM).

show pim nsf

To display the state of nonstop forwarding (NSF) operation for Protocol Independent Multicast (PIM), use the **show pim nsf** command in EXEC mode.

show pim [ipv4] nsf

Syntax Description	ipv4 (Optional) Specifies IPv4 address prefixes.

Command Default	IPv4 addressing is the default.

Command Modes	EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim nsf** command displays the current multicast NSF state for PIM. For multicast NSF, the state may be normal or activated for nonstop forwarding. The latter state indicates that recovery is in progress due to a failure in the Multicast Routing Information Base (MRIB) or PIM. The total NSF timeout and time remaining are displayed until NSF expiration.

Task ID	Task ID	Operations
	multicast	read

Examples

The following is sample output from the **show pim nsf** command:

```
RP/0/RSP0/CPU0:router# show pim nsf

IP PIM Non-Stop Forwarding Status:
Multicast routing state: Non-Stop Forwarding Activated
NSF Lifetime: 00:02:00
NSF Time Remaining: 00:01:56
This table describes the significant fields shown in the display.
```

Table 38: show pim nsf Field Descriptions

Field	Description
Multicast routing state	PIM state is in NSF recovery mode (Normal or Non-Stop Forwarding Activated).
NSF Lifetime	Total NSF lifetime (seconds, hours, and minutes) configured for PIM.
NSF Time Remaining	Time remaining in NSF recovery for PIM if NSF recovery is activated.

show pim range-list

To display range-list information for Protocol Independent Multicast (PIM), use the **show pim range-list** command in EXEC mode.

show pim [*vrf vrf-name*] [**ipv4**] **range-list** [**config**] [*ip-address-name*]

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
	ipv4	(Optional) Specifies IPv4 address prefixes.
	config	(Optional) Displays PIM command-line interface (CLI) range list information.
	<i>ip-address-name</i>	(Optional) IP address of the rendezvous point.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim range-list** command is used to determine the multicast forwarding mode to group mapping. The output also indicates the rendezvous point (RP) address for the range, if applicable. The **config** keyword means that the particular range is statically configured.

Task ID	Task ID	Operations
	multicast	read

Examples The following is sample output from the **show pim range-list** command:

```
RP/0/RSP0/CPU0:router# show pim range-list
```



```

config SSM Exp: never Src: 0.0.0.0
  230.0.0.0/8 Up: 03:47:09
config BD RP: 172.16.1.3 Exp: never Src: 0.0.0.0
  239.0.0.0/8 Up: 03:47:16
config SM RP: 172.18.2.6 Exp: never Src: 0.0.0.0
  235.0.0.0/8 Up: 03:47:09

```

This table describes the significant fields shown in the display.

Table 39: show pim range-list Field Descriptions

Field	Description
config	Group range was learned by means of configuration.
SSM	PIM mode is operating in Source Specific Multicast (SSM) mode. Other modes are Sparse-Mode (SM) and bidirectional (BD) mode.
Exp: never	Expiration time for the range is “never”.
Src: 0.0.0.0	Advertising source of the range.
230.0.0.0/8	Group range: address and prefix.
Up: 03:47:09	Total time that the range has existed in the PIM group range table. In other words, the uptime in hours, minutes, and seconds.

Related Commands

Command	Description
show pim group-map , on page 454	Displays group-to-PIM mode mapping.

show pim rpf

To display information about reverse-path forwarding (RPF) in one or more routing tables within Protocol Independent Multicast (PIM), use the **show pim rpf** command in EXEC mode.

```
show pim [vrf vrf-name] [ipv4] {multicast| safi-all| unicast} [topology {tablename| all}] rpf
[ip-address/name]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
multicast	(Optional) Specifies a multicast secondary address family (SAFI).
safi-all	(Optional) Specifies a secondary address family (SAFI) wildcard.
unicast	(Optional) Specifies a unicast secondary address family (SAFI).
topology	(Optional) Specifies the display of multitopology routing table information.
<i>table-name</i>	Name of the specific multitopology table to show.
all	Specifies that detailed information be displayed for all multitopology routing tables in PIM.
<i>ip-address/name</i>	(Optional) IP address or name, or both, for the default or selected route policy with the domain IPv4 host in the format <i>A.B.C.D</i> . Note The <i>ip-address</i> argument can also be a Protocol Independent Multicast (PIM) rendezvous point (RP) address.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following example shows output from the **show pim rpf** command:

```
RP/0/RSP0/CPU0:router# show pim rpf
```

```
Table: IPv4-Unicast-default
* 61.61.1.10/32 [90/181760]
  via GigabitEthernet0/1/0/1.201 with rpf neighbor 11.21.0.20
  via GigabitEthernet0/1/0/1.202 with rpf neighbor 11.22.0.20
  via GigabitEthernet0/1/0/1.203 with rpf neighbor 11.23.0.20
* 61.61.1.91/32 [90/181760]
  via GigabitEthernet0/1/0/1.201 with rpf neighbor 11.21.0.20
  via GigabitEthernet0/1/0/1.202 with rpf neighbor 11.22.0.20
  via GigabitEthernet0/1/0/1.203 with rpf neighbor 11.23.0.20
* 61.61.1.92/32 [90/181760]
  via GigabitEthernet0/1/0/1.201 with rpf neighbor 11.21.0.20
  via GigabitEthernet0/1/0/1.202 with rpf neighbor 11.22.0.20
  via GigabitEthernet0/1/0/1.203 with rpf neighbor 11.23.0.20
* 61.61.1.93/32 [90/181760]
  via GigabitEthernet0/1/0/1.201 with rpf neighbor 11.21.0.20
  via GigabitEthernet0/1/0/1.202 with rpf neighbor 11.22.0.20
  via GigabitEthernet0/1/0/1.203 with rpf neighbor 11.23.0.20
```

show pim rpf hash

To display information for Routing Information Base (RIB) lookups used to predict RPF next-hop paths for routing tables in Protocol Independent Multicast (PIM), use the **show pim rpf hash** command in EXEC mode.

show pim [*vrf vrf-name*] [*ipv4*] [*multicast| safi-all| unicast*] [*topology {table-name| all}*] **rpf hash** *root/group ip-address/name* [*hash-mask-length bit-length*] **mofrr**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
multicast	(Optional) Specifies a multicast secondary address family (SAFI).
safi-all	(Optional) Specifies a secondary address family (SAFI) wildcard.
unicast	(Optional) Specifies a unicast secondary address family (SAFI).
topology	(Optional) Specifies the display of multitopology routing table information.
<i>table-name</i>	Name of the specific multitopology table to show.
all	Specifies that detailed information be displayed for all multitopology routing tables in PIM.
<i>root/group ip-address / group-name</i>	Root or group address, or both, for the default or selected route policy. IP address is as defined in the Domain Name System (DNS) hosts table or with the domain ipv4 host in the format <i>A.B.C.D</i> .
hash-mask-length <i>bit-length</i>	(Optional) Specifies the bootstrap router (BSR) hash mask length to be applied to the next-hop hashing. Default is the BSR hash mask length known for the matching group range (or host mask length if BSR is not configured for the range). The range in bit length is 0 to 32.
mofrr	(Optional) Specifies MOFRR hashing.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim rpf hash** command lets you predict the way routes balance across Equal-Cost Multipath (ECMP) next hops. It does not require that route to exist in the Multicast Routing Information Base (MRIB) at the time.

When using the *ip-address* argument for a (*,G) route, use the rendezvous point address and omit the *group-address* argument. For (S,G) routes, use the *ip-address* and the *group-address* arguments.

Task ID

Task ID	Operations
multicast	read

Examples

When you use the **show pim rpf hash** command, Cisco IOS XR software displays statistics regarding route policy invocations in topology tables:

```
RP/0/RSP0/CPU0:router# show pim rpf hash 10.0.0.1 239.0.0.1
```

Multipath RPF selection is enabled.

RPF next-hop neighbor selection result: POS0/2/0/0,10.1.0.1

The following example shows the results from use of the **mofrr** keyword:

```
RP/0/RSP0/CPU0:router# show pim rpf hash 11.11.0.4 226.1.1.2 mofrr
```

```
Table: IPv4-Unicast-default
Multipath RPF selection is enabled.
RPF next-hop neighbor selection result:
GigabitEthernet0/4/0/4,55.55.55.101
Secondary RPF next-hop neighbor selection result:
GigabitEthernet0/4/0/4,55.55.55.101
```

Related Commands

Command	Description
show pim rpf , on page 470	Displays information about reverse-path forwarding (RPF) in one or more routing tables within Protocol Independent Multicast (PIM).

show pim rpf route-policy statistics

To display statistics for reverse-path forwarding (RPF) route policy invocations in Protocol Independent Multicast (PIM) routing tables, use the **show pim rpf route-policy statistics** command in EXEC mode.

show pim [vrf vrf-name] [ipv4] rpf route-policy statistics

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read

Examples The following sample output from the **show pim rpf route-policy statistics** command displays statistics about route policy invocations in topology tables:

```
RP/0/RSP0/CPU0:router# show pim mt4-p201 rpf route-policy statistics

RPF route-policy statistics for VRF default:
Route-policy name: mt4-p201
Number of lookup requests 25
Pass 25, Drop 0
Default RPF Table selection 5, Specific RPF Table selection 20
This table describes the significant fields shown in the display.
```

Table 40: show pim rpf route-policy statistics Field Description

Field	Description
Route-policy name	Name of a specific route policy.
Number of lookup requests	Number of times the route policy was run to determine the RPF table.
Pass	Number of (S,G) entries that were passed by the route policy.
Drop	Number of (S,G) entries that were dropped by the route policy.
Default RPF Table selection/Specific RPF Table selection	When an (S,G) entry is accepted by the route policy, it can either select the default RPF table (can be either the unicast default or multicast default table) or any specific named or default RPF table. The last line of output indicates the number of entries that fall into these two categories.

show pim rpf route-policy test

To test the outcome of a route-policy with reverse-path forwarding (RPF), use the **show pim rpf route-policy test** command in EXEC mode.

show pim [*vrf vrf-name*] [*ipv4*] **rpf route-policy test** *src-ip-address/grp-address*

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>src-ip-address/ grp-address</i>	Source or group address, or both, for the default or selected route policy, as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following sample output from the **show pim rpf route-policy test** command displays the RPF table selected by the route policy for a given source and/or group address:

```
RP/0/RSP0/CPU0:router# show pim ipv4 rpf route-policy test 10.11.11.11 225.2.0.1
```

```
RPF route-policy test for VRF default:
Route-policy name: mt4-p2
Source 10.11.11.11, Group 225.2.0.1
```



```
Result: Pass
Default RPF Table selected
RPF Table: IPv4-Unicast-default (Created, Active)
```

This table describes the significant fields shown in the display.

Table 41: show pim rpf route-policy test Field Descriptions

Field	Description
Route-policy name	Name of a specific route policy.
Source	Source IP name for the route policy.
Group	Group IP name for the route policy.
Result	Specifies whether the (S,G) entry was accepted by the route policy.
Default RPF Table	Specifies whether the (S,G) entry uses the default or a specific RPF table.
RPF Table	Specifies which RPF table was selected, and whether or not the table was created in PIM and is active.

show pim rpf summary

To display summary information about the interaction of Protocol Independent Multicast (PIM) with the Routing Information Base (RIB), including the convergence state, current default RPF table, and the number of source or rendezvous point registrations created, use the **show pim rpf summary** command in EXEC mode.

```
show pim [vrf vrf-name] [ipv4] [multicast| safi-all| unicast] [topology {table-name| all}] rpf summary
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
multicast	(Optional) Specifies a multicast secondary address family (SAFI).
safi-all	(Optional) Specifies a secondary address family (SAFI) wildcard.
unicast	(Optional) Specifies a unicast secondary address family (SAFI).
topology	(Optional) Specifies the display of multitopology routing table information.
<i>table-name</i>	Name of the specific multitopology table to show.
all	Specifies that detailed information be displayed for all multitopology routing tables in PIM.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
multicast	read

Examples

The following sample output shows RPF information for multiple tables. The first part of the output example describes VRF-level information. The remainder consists of information specific to one or more tables.

**Note**

RPF table indicates the table in which the RPF lookup was performed for this route entry.

```
RP/0/RSP0/CPU0:router# show pim ipv4 unicast topology all rpf summary
```

```
MBGP                               Not configured
  OSPF Mcast-intact                Not configured
  ISIS Mcast-intact                Not configured
  ISIS Mcast Topology              Not configured

PIM RPFs registered with Unicast RIB table

Default RPF Table: IPv4-Unicast-default
RIB Convergence Timeout Value: 00:30:00
RIB Convergence Time Left:      00:00:00
Multipath RPF Selection is Enabled

Table: IPv4-Multicast-default
  PIM RPF Registrations = 0
  RIB Table converged

Table: IPv4-Multicast-t300
  PIM RPF Registrations = 3
  RIB Table converged

Table: IPv4-Multicast-t310
  PIM RPF Registrations = 5
  RIB Table converged

Table: IPv4-Multicast-t320
  PIM RPF Registrations = 5
  RIB Table converged
```

The first part of the output example describes VRF-level information. The remainder consists of information specific to one or more tables.

The following example shows the sample output for **show pim rpf summary** command:

```
RP/0/RSP0/CPU0:router# show pim rpf summary
```

```
MBGP                               Not configured
  OSPF Mcast-intact                Configured
  ISIS Mcast-intact                Not configured
  ISIS Mcast Topology              Not configured
  MoFRR Flow-based                 Configured
  MoFRR RIB                        Not configured

PIM RPFs registered with Multicast RIB table

Default RPF Table: IPv4-Multicast-default
RIB Convergence Timeout Value: 00:30:00
RIB Convergence Time Left:      00:00:00
Multipath RPF Selection is Disabled

Table: IPv4-Multicast-default
  PIM RPF Registrations = 3
  RIB Table converged
```

show pim summary

To display configured Protocol Independent Multicast (PIM) out-of-resource (OOR) limits and current counts, use the **show pim summary** command in EXEC mode.

show pim [*vrf vrf-name*] [*ipv4*] **summary**

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance associated with this count.
	ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show pim summary** command is used to identify configured OOR information for the PIM protocol, such as number of current and maximum routes.

Task ID	Task ID	Operations
	multicast	read

Examples

The following is sample output from the **show pim summary** command that shows five PIM routes, with the maximum number of routes allowed being 100000:

```
RP/0/RSP0/CPU0:router# show pim summary
PPIM Summary for VRF:default
PIM State Counters
Current          Maximum          Warning-threshold
```

```

Routes 40 100000 100000
Topology Interface States 371 300000 300000
SM Registers 0 20000 20000
Group Ranges from AutoRP 3 100

```

This table describes the significant fields shown in the display.

Table 42: show pim summary Field Descriptions

Field	Description
Routes	Current number of routes (in the PIM topology table) and the maximum allowed before the creation of new routes is prohibited to avoid out-of-resource (OOR) conditions.
Routes x Interfaces	Current total number of interfaces (in the PIM topology table) present in all route entries and the maximum allowed before the creation of new routes is prohibited to avoid OOR conditions.
SM Registers	Current number of sparse mode route entries from which PIM register messages are received and the maximum allowed before the creation of new register states is prohibited to avoid OOR conditions.
Group Ranges from AutoRP	Current number of sparse mode group range-to-rendezvous point mappings learned through the auto-rendezvous point (Auto-RP) mechanism and the maximum allowed before the creation of new group ranges is prohibited to avoid OOR conditions.
Warning-threshold	Maximum number of multicast routes that can be configured per router.

show pim topology

To display Protocol Independent Multicast (PIM) routing topology table information for a specific group or all groups, use the **show pim topology** command in EXEC mode.

```
show pim [vrf vrf-name] [ipv4] topology [src-ip-address/grp-address]
```

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>src-ip-address/ grp-address</i>	Source IP address or group IP address, as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format <i>A.B.C.D</i> .

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the PIM routing topology table to display various entries for a given group, (*, G), (S, G), and (S, G) RPT, each with its own interface list.

PIM communicates the contents of these entries through the Multicast Routing Information Base (MRIB), which is an intermediary for communication between multicast routing protocols, such as PIM; local membership protocols, such as Internet Group Management Protocol (IGMP); and the multicast forwarding engine of the system.

The MRIB shows on which interface the data packet should be accepted and on which interfaces the data packet should be forwarded, for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.

When multicast-only fast reroute (MoFRR) feature is enabled, the **show pim topology** command shows the SGs that are configured for MoFRR. For information about the MoFRR primary and secondary paths, see the description of the command [show pim topology detail](#), on page 489.

**Note**

For forwarding information, use the **show mfib route** and **show mrrib route** commands.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim topology** command:

```
RP/0/RSP0/CPU0:router# show pim topology
```

```
IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
RR - Register Received, SR - Sending Registers, E - MSDP External, EX - Extranet
DCC - Don't Check Connected,
ME - MDT Encap, MD - MDT Decap,
MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
II - Internal Interest, ID - Internal Dissinterest,
LH - Last Hop, AS - Assert, AB - Admin Boundary

(11.0.0.1,239.9.9.9)SPT SM Up: 00:00:13
JP: Join(never) RPF: Loopback1,11.0.0.1* Flags: KAT(00:03:16) RA RR
No interfaces in immediate olist

(*,239.9.9.9) SM Up: 4d14h RP: 11.0.0.1*
JP: Join(never) RPF: Decapstunnel0,11.0.0.1 Flags: LH
POS0/3/0/0 4d14h fwd LI II LH

(*,224.0.1.39) DM Up: 02:10:38 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
POS0/2/0/0 02:10:38 off LI II LH

(*,224.0.1.40) DM Up: 03:54:23 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
POS0/2/0/0 03:54:23 off LI II LH
POS0/2/0/2 03:54:14 off LI
POS0/4/0/0 03:53:37 off LI

(*,239.100.1.1) BD Up: 03:51:35 RP: 200.6.1.6
JP: Join(00:00:24) RPF: POS0/4/0/0,10.10.4.6 Flags:
POS0/2/0/0 03:42:05 fwd Join(00:03:18)
POS0/2/0/2 03:51:35 fwd Join(00:02:54)
(*,235.1.1.1) SM Up: 03:51:39 RP: 200.6.2.6
JP: Join(00:00:50) RPF: POS0/4/0/0,10.10.4.6 Flags:
POS0/2/0/2 02:36:09 fwd Join(00:03:20)
POS0/2/0/0 03:42:04 fwd Join(00:03:16)
```

The following example shows output for a MoFRR convergence:

```
RP/0/RSP0/CPU0:router# show pim topology 239.1.1.1
```

```
IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
RR - Register Received, SR - Sending Registers, E - MSDP External,
DCC - Don't Check Connected,
```

show pim topology

```

ME - MDT Encap, MD - MDT Decap,
MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
II - Internal Interest, ID - Internal Dissinterest,
LH - Last Hop, AS - Assert, AB - Admin Boundary

(192.1.1.2,239.1.1.1)SPT SSM Up: 13:54:06
JP: Join(00:00:41) RPF: GigabitEthernet0/5/0/3.3,100.100.0.10 MoFRR RIB, Flags:
GigabitEthernet0/5/0/1      13:54:06  fwd LI LH
RP/0/4/CPU0:Sunnyvale#show pim topology 239.1.1.1 detail

```

```

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
RR - Register Received, SR - Sending Registers, E - MSDP External,
DCC - Don't Check Connected,
ME - MDT Encap, MD - MDT Decap,
MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
II - Internal Interest, ID - Internal Dissinterest,
LH - Last Hop, AS - Assert, AB - Admin Boundary

```

```

(192.1.1.2,239.1.1.1)SPT SSM Up: 13:54:10
JP: Join(00:00:37) RPF: GigabitEthernet0/5/0/3.3,100.100.0.10 MoFRR RIB, Flags:
RPF Table: IPv4-Unicast-default
RPF Secondary: GigabitEthernet0/5/0/3.2,100.100.200.10
GigabitEthernet0/5/0/1      13:54:10  fwd LI LH

```

The following example shows a sample output for flow-based MoFRR:

```
RP/0/RSP0/CPU0:router# show pim topology
```

```

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive
RA - Really Alive, IA - Inherit Alive, LH - Last Hop
DSS - Don't Signal Sources, RR - Register Received
SR - Sending Registers, E - MSDP External, EX - Extranet
DCC - Don't Check Connected, ME - MDT Encap, MD - MDT Decap
MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
II - Internal Interest, ID - Internal Dissinterest,
LH - Last Hop, AS - Assert, AB - Admin Boundary, EX - Extranet

(*,224.0.1.40) DM Up: 00:31:45 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
GigabitEthernet0/0/0/8      00:31:45  off LI II LH

```

```

(20.20.20.1,225.0.0.1)SPT SM Up: 00:31:39
JP: Join(00:00:09) RPF: GigabitEthernet0/0/0/8,20.20.20.1 MoFRR, Flags:
GigabitEthernet0/0/0/28      00:31:39  fwd LI LH

```

```

(20.20.20.1,225.0.0.2)SPT SM Up: 00:31:39
JP: Join(00:00:09) RPF: GigabitEthernet0/0/0/8,20.20.20.1 MoFRR, Flags:
GigabitEthernet0/0/0/28      00:31:39  fwd LI LH

```

If the option detail is issued, then the secondary RPF of MoFRR route will be shown in the console.

```
RP/0/RSP0/CPU0:router# show pim topology detail
```

```

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive
RA - Really Alive, IA - Inherit Alive, LH - Last Hop
DSS - Don't Signal Sources, RR - Register Received
SR - Sending Registers, E - MSDP External, EX - Extranet
DCC - Don't Check Connected, ME - MDT Encap, MD - MDT Decap
MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info

```



```

Interface flags: LI - Local Interest, LD - Local Dissinterest,
                II - Internal Interest, ID - Internal Dissinterest,
                LH - Last Hop, AS - Assert, AB - Admin Boundary, EX - Extranet

(*,224.0.1.40) DM Up: 03:16:10 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
RPF Table: None
  GigabitEthernet0/0/0/8      03:16:10  off LI II LH

(20.20.20.1,225.0.0.1)SPT SM Up: 03:16:04
JP: Join(00:00:45) RPF: GigabitEthernet0/0/0/8,20.20.20.1 MoFRR, Flags:
RPF Table: IPv4-Unicast-default
RPF Secondary: GigabitEthernet0/0/0/18,20.20.20.1
  GigabitEthernet0/0/0/28      03:16:04  fwd LI LH

(20.20.20.1,225.0.0.2)SPT SM Up: 03:16:04
JP: Join(00:00:45) RPF: GigabitEthernet0/0/0/8,20.20.20.1 MoFRR, Flags:
RPF Table: IPv4-Unicast-default
RPF Secondary: GigabitEthernet0/0/0/18,20.20.20.1
  GigabitEthernet0/0/0/28      03:16:04  fwd LI LH

```

This table describes the significant fields shown in the display. It includes fields that do not appear in the example, but that may appear in your output.

Table 43: show pim topology Field Descriptions

Field	Description
(11.0.0.1,239.9.9.9)SPT	Entry state. Source address, group address, and tree flag (shortest path tree or rendezvous point tree) for the route entry. Note that the tree flag may be missing from the entry.
SM	Entry protocol. PIM protocol mode in which the entry operates: sparse mode (SM), source specific multicast (SSM), bidirectional (BD), or dense-mode (DM).
Up: 00:00:13	Entry uptime. Time (in hours, minutes, and seconds) this entry has existed in the topology table.
RP: 11.0.0.1*	Entry information. Additional information about the route entry. If route entry is a sparse mode or bidirectional PIM route, the RP address is given.
JP: Null(never)	Entry join/prune state. Indicates if and when a join or prune message is sent to the RPF neighbor for the route.
MoFRR RIB, Flags:	Indicates whether the (S,G) route is a RIB-based MoFRR route.
MoFRR, Flags:	Indicates whether the (S,G) route is a flow-based MoFRR route. By default, a flow-based MoFRR route will be a RIB-based MoFRR route but not in the reverse way.
RPF Table	IPv4 Unicast default.

Field	Description
RPF Secondary	Secondary path interface
Entry Information Flags	
KAT - Keep Alive Timer	The keepalive timer tracks whether traffic is flowing for the (S, G) route on which it is set. A route does not time out while the KAT is running. The KAT runs for 3.5 minutes, and the route goes into KAT probing mode for as long as 65 seconds. The route is deleted if no traffic is seen during the probing interval, and there is no longer any reason to keep the route—for example, registers and (S, G) joins.
AA - Assume Alive	Flag that indicates that the route was alive, but recent confirmation of traffic flow was not received.
PA - Probe Alive	Flag that indicates that the route is probing the data plane to determine if traffic is still flowing for this route before it is timed out.
RA - Really Alive	Flag that indicates that the source is confirmed to be sending traffic for the route.
LH - Last Hop	Flag that indicates that the entry is the last-hop router for the entry. If (S, G) routes inherit the LH list from an (*, G) route, the route entry LH flag appears only on the (*, G) route.
IA - Inherit Alive	Flag that indicates a source VPN routing and forwarding (VRF) route with the KAT active.
DSS - Don't Signal Sources	Flag that may be set on the last-hop (*, G) entries that indicates that new matching sources should not be signaled from the forwarding plane.
DCC - Don't Check Connected	Flag that is set when the KAT probes, which indicates that the connected check for new sources should be omitted in the forwarding plane.
RR - Register Received	Flag that indicates that the RP has received and answered PIM register messages for this (S, G) route.
SR - Sending Registers	Flag that indicates that the first-hop DR has begun sending registers for this (S, G) route, but has not yet received a Register-Stop message.
E - MSDP External	Flag that is set on those entries that have sources, learned through Multicast Source Discovery Protocol (MSDP), from another RP.

Field	Description
ME - MDT Encap	Flag that indicates a core encapsulation route for a multicast distribution tree (MDT).
MD - MDT Decap	Flag that indicates a core decapsulation route for an MDT.
MT - Crossed Data MDT threshold	Flag that indicates that traffic on this route passed a threshold for the data MDT.
MA - Data MDT group assigned	Flag that indicates a core encapsulation route for the data MDT.
POS0/2/0/0	Interface name. Name of an interface in the interface list of the entry.
03:54:23	Interface uptime. Time (in hours, minutes, and seconds) this interface has existed in the entry.
off	Interface forwarding status. Outgoing forwarding status of the interface for the entry is “fwd” or “off”.
Interface Information Flags	
LI - Local Interest	Flag that indicates that there are local receivers for this entry on this interface, as reported by Internet Group Management Protocol (IGMP).
LD - Local Disinterest	Flag that indicates that there is explicit disinterest for this entry on this interface, as reported by IGMP exclude mode reports.
II - Internal Interest	Flag that indicates that the host stack of the router has internal receivers for this entry.
ID - Internal Disinterest	Flag that indicates that the host stack of the router has explicit internal disinterest for this entry.
LH - Last Hop	Flag that indicates that this interface has directly connected receivers and this router serves as a last hop for the entry. If the (S, G) outgoing interface list is inherited from a (*, G) route, the LH flag is set on the (*, G) outgoing LH interface.
AS - Assert	Flag that indicates that a PIM assert message was seen on this interface and the active PIM assert state exists.

 show pim topology

Field	Description
AB - Administrative Boundary	Flag that indicates that forwarding on this interface is blocked by a configured administrative boundary for this entry's group range.

Related Commands

Command	Description
show mfib route	Displays all entries in the MFIB table.

show pim topology detail

To display detailed Protocol Independent Multicast (PIM) routing topology information that includes references to the tables in which reverse path forwarding (RPF) lookups occurred for specific topology route entries, use the **show pim topology detail** command in EXEC mode.

show pim [**vrf** *vrf-name*] [**ipv4**] **topology detail**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the PIM topology table to display various entries for a given group, (*, G), (S, G), and (S, G)RPT, each with its own interface list.

PIM communicates the contents of these entries through the Multicast Routing Information Base (MRIB), which is an intermediary for communication between multicast routing protocols, such as PIM; local membership protocols, such as Internet Group Management Protocol (IGMP); and the multicast forwarding engine of the system.

The MRIB shows on which interface the data packet should be accepted and on which interfaces the data packet should be forwarded, for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.

When the multicast-only fast reroute (MoFRR) feature is enabled, the **show pim topology detail** command shows the primary and secondary paths for SGs configured for MoFRR.



Note

For forwarding information, use the **show mfib route** and **show mrrib route** commands.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim topology detail** command, showing the RPF table information for each topology entry:

```
RP/0/RSP0/CPU0:router# show pim ipv4 topology detail

IP PIM Multicast Topology Table:
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
             RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
             RR - Register Received, SR - Sending Registers, E - MSDP External,
             DCC - Don't Check Connected,
             ME - MDT Encap, MD - MDT Decap,
             MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
                II - Internal Interest, ID - Internal Dissinterest,
                LH - Last Hop, AS - Assert, AB - Admin Boundary

(*,224.0.1.40) DM Up: 00:07:28 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
RPF Table: None
  GigabitEthernet0/1/0/1      00:07:28  off LI II LH
  GigabitEthernet0/1/0/2      00:07:23  off LI LH
  GigabitEthernet0/1/0/1.503  00:07:27  off LI LH

(11.11.11.11,232.5.0.2)SPT SSM Up: 00:07:21
JP: Join(now) RPF: GigabitEthernet0/1/0/1.203,11.23.0.20 Flags:
RPF Table: IPv4-Unicast-default
  GigabitEthernet0/1/0/1.501  00:07:21  fwd LI LH

(61.61.0.10,232.5.0.3)SPT SSM Up: 00:11:57
JP: Join(now) RPF: Null,0.0.0.0 Flags:
RPF Table: None (Dropped due to route-policy)
  No interfaces in immediate olist
```



Note

The RPF table output in boldface indicates the table in which the RPF lookup occurred for this route entry.

The following example shows output for a MoFRR convergence:

```
RP/0/RSP0/CPU0:router# show pim topology 239.1.1.1 detail

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
             RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
             RR - Register Received, SR - Sending Registers, E - MSDP External,
             DCC - Don't Check Connected,
             ME - MDT Encap, MD - MDT Decap,
             MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
                II - Internal Interest, ID - Internal Dissinterest,
                LH - Last Hop, AS - Assert, AB - Admin Boundary

(192.1.1.2,239.1.1.1)SPT SSM Up: 13:54:06
```

```
JP: Join(00:00:41) RPF: GigabitEthernet0/5/0/3.3,100.100.0.10 MoFRR RIB, Flags:
  GigabitEthernet0/5/0/1      13:54:06  fwd LI LH
RP/0/4/CPU0:Sunnyvale#show pim topology 239.1.1.1 detail
```

```
IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive,
  RA - Really Alive, LH - Last Hop, DSS - Don't Signal Sources,
  RR - Register Received, SR - Sending Registers, E - MSDP External,
  DCC - Don't Check Connected,
  ME - MDT Encap, MD - MDT Decap,
  MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
  II - Internal Interest, ID - Internal Dissinterest,
  LH - Last Hop, AS - Assert, AB - Admin Boundary
```

```
(192.1.1.2,239.1.1.1)SPT SSM Up: 13:54:10
JP: Join(00:00:37) RPF: GigabitEthernet0/5/0/3.3,100.100.0.10 MoFRR RIB, Flags:
RPF Table: IPv4-Unicast-default
RPF Secondary: GigabitEthernet0/5/0/3.2,100.100.200.10
  GigabitEthernet0/5/0/1      13:54:10  fwd LI LH
```

[Table 43: show pim topology Field Descriptions, on page 485](#) describes the significant fields shown in the display, including those related to multicast-only fast reroute (MoFRR). This table includes fields that do not appear in the example, but that may appear in your output.

Related Commands

Command	Description
show mfib route	Displays all entries in the MFIB table.
show mrrib route	Displays all entries in the MRIB table.

show pim topology entry-flag

To display Protocol Independent Multicast (PIM) routing topology information for a specific entry flag, use the **show pim topology entry-flag** command in EXEC mode.

show pim [*vrf vrf-name*] [**ipv4**] **topology entry-flag** *flag* [**detail**| **route-count**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>flag</i>	Configures a display of routes with the specified entry flag. Valid flags are the following: • AA —Assume alive • DCC —Don't check connected • DSS —Don't signal sources • E —MSDP External • EX —Extranet flag set • IA —Inherit except flag set • KAT —Keepalive timer • LH —Last hop • PA —Probe alive • RA —Really alive • RR —Registered receiver • SR —Sending registers
detail	(Optional) Specifies details about the entry flag information.
route-count	(Optional) Displays the number of routes in the PIM topology table.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the PIM topology table to display various entries for a given group, (*, G), (S, G), and (S, G)RPT, each with its own interface list.

PIM communicates the contents of these entries through the Multicast Routing Information Base (MRIB), which is an intermediary for communication between multicast routing protocols, such as PIM; local membership protocols, such as Internet Group Management Protocol (IGMP); and the multicast forwarding engine of the system.

The MRIB shows on which interface the data packet should be accepted and on which interfaces the data packet should be forwarded, for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.

**Note**

For forwarding information, use the **show mfib route** and **show mrrib route** commands.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim topology entry-flag** command:

```
RP/0/RSP0/CPU0:router# show pim topology entry-flag E

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive
              RA - Really Alive, IA - Inherit Alive, LH - Last Hop
              DSS - Don't Signal Sources, RR - Register Received
              SR - Sending Registers, E - MSDP External, EX - Extranet
              DCC - Don't Check Connected, ME - MDT Encap, MD - MDT Decap
              MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
                 II - Internal Interest, ID - Internal Dissinterest,
                 LH - Last Hop, AS - Assert, AB - Admin Boundary, EX - Extranet

(202.5.5.202,226.0.0.0)SPT SM Up: 00:27:06
JP: Join(00:00:11) RPF: GigabitEthernet0/2/0/2,44.44.44.103 Flags: KAT(00:01:54) E RA
  No interfaces in immediate olist

(203.5.5.203,226.0.0.0)SPT SM Up: 00:27:06
JP: Join(00:00:11) RPF: GigabitEthernet0/2/0/2,44.44.44.103 Flags: KAT(00:01:54) E RA
  No interfaces in immediate olist

(204.5.5.204,226.0.0.0)SPT SM Up: 00:27:06
JP: Join(00:00:11) RPF: GigabitEthernet0/2/0/2,44.44.44.103 Flags: KAT(00:01:54) E RA
  No interfaces in immediate olist

(204.5.5.204,226.0.0.1)SPT SM Up: 00:27:06
```

show pim topology entry-flag

```
JP: Join(00:00:11) RPF: GigabitEthernet0/2/0/2,44.44.44.103 Flags: KAT(00:01:54) E RA  
No interfaces in immediate olist
```

[Table 43: show pim topology Field Descriptions, on page 485](#) describes the significant fields shown in the display. This table includes fields that do not appear in the example, but that may appear in your output.

Related Commands

Command	Description
show mrib route	Displays all entries in the MRIB table.

show pim topology interface-flag

To display Protocol Independent Multicast (PIM) routing topology information for a specific interface, use the **show pim topology** command in EXEC mode.

show pim [**vrf** *vrf-name*] [**ipv4**] **topology interface-flag** *flag* [**detail**] **route-count**

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>flag</i>	Configures a display of routes with the specified interface flag. Valid flags are the following:
detail	(Optional) Displays details about the interface flag information.
route-count	(Optional) Displays the number of routes in the PIM topology table.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the PIM topology table to display various entries for a given group, (*, G), (S, G), and (S, G)RPT, each with its own interface list.

PIM communicates the contents of these entries through the Multicast Routing Information Base (MRIB), which is an intermediary for communication between multicast routing protocols, such as PIM; local membership protocols, such as Internet Group Management Protocol (IGMP); and the multicast forwarding engine of the system.

The MRIB shows on which interface the data packet should be accepted and on which interfaces the data packet should be forwarded, for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.

**Note**

For forwarding information, use the **show mfib route** and **show mrrib route** commands.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show pim topology interface-flag** command:

```
RP/0/RSP0/CPU0:router# show pim topology interface-flag LI

IP PIM Multicast Topology Table
Entry state: (*S,G)[RPT/SPT] Protocol Uptime Info
Entry flags: KAT - Keep Alive Timer, AA - Assume Alive, PA - Probe Alive
              RA - Really Alive, IA - Inherit Alive, LH - Last Hop
              DSS - Don't Signal Sources, RR - Register Received
              SR - Sending Registers, E - MSDP External, EX - Extranet
              DCC - Don't Check Connected, ME - MDT Encap, MD - MDT Decap
              MT - Crossed Data MDT threshold, MA - Data MDT group assigned
Interface state: Name, Uptime, Fwd, Info
Interface flags: LI - Local Interest, LD - Local Dissinterest,
                 II - Internal Interest, ID - Internal Dissinterest,
                 LH - Last Hop, AS - Assert, AB - Admin Boundary, EX - Extranet

(*,224.0.1.39) DM Up: 00:27:27 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
  Loopback5                00:27:27  off LI II LH

(*,224.0.1.40) DM Up: 00:27:27 RP: 0.0.0.0
JP: Null(never) RPF: Null,0.0.0.0 Flags: LH DSS
  Loopback5                00:27:26  off LI II LH
  GigabitEthernet0/2/0/2    00:27:27  off LI LH

(*,226.0.0.0) SM Up: 00:27:27 RP: 97.97.97.97*
JP: Join(never) RPF: Decapstunnel0,97.97.97.97 Flags: LH
  Loopback5                00:27:27  fwd LI LH

(*,226.0.0.1) SM Up: 00:27:27 RP: 97.97.97.97*
JP: Join(never) RPF: Decapstunnel0,97.97.97.97 Flags: LH
  Loopback5                00:27:27  fwd LI LH

(*,226.0.0.3) SM Up: 00:27:27 RP: 97.97.97.97*
JP: Join(never) RPF: Decapstunnel0,97.97.97.97 Flags: LH
  Loopback5                00:27:27  fwd LI LH

(*,226.0.0.4) SM Up: 00:27:27 RP: 97.97.97.97*
JP: Join(never) RPF: Decapstunnel0,97.97.97.97 Flags: LH
  Loopback5                00:27:27  fwd LI LH

(*,226.0.0.5) SM Up: 00:27:27 RP: 97.97.97.97*
JP: Join(never) RPF: Decapstunnel0,97.97.97.97 Flags: LH
  Loopback5                00:27:27  fwd LI LH

(201.5.5.201,226.1.0.0)SPT SM Up: 00:27:27
JP: Join(never) RPF: Loopback5,201.5.5.201* Flags: KAT(00:00:34) RA RR (00:03:53)
  GigabitEthernet0/2/0/2    00:26:51  fwd Join(00:03:14)
  Loopback5                00:27:27  fwd LI LH

(204.5.5.204,226.1.0.0)SPT SM Up: 00:27:27
JP: Join(now) RPF: GigabitEthernet0/2/0/2,44.44.44.103 Flags: E
  Loopback5                00:27:27  fwd LI LH
```

Table 43: [show pim topology Field Descriptions](#), on page 485 describes the significant fields shown in the display. This table includes fields that do not appear in the example, but that may appear in your output.

Related Commands

Command	Description
show mrib route	Displays all entries in the MRIB table.

show pim topology summary

To display summary information about the Protocol Independent Multicast (PIM) routing topology table, use the **show pim topology summary** command in EXEC mode.

```
show pim [vrf vrf-name] [ipv4] topology summary [detail]
```

Syntax Description	vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
	ipv4	(Optional) Specifies IPv4 address prefixes.
	detail	(Optional) Displays details about the summary information.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is op

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the PIM topology table to display various entries for a given group, (*, G), (S, G), and (S, G)RPT, each with its own interface list.

PIM communicates the contents of these entries through the Multicast Routing Information Base (MRIB), which is an intermediary for communication between multicast routing protocols, such as PIM; local membership protocols, such as Internet Group Management Protocol (IGMP); and the multicast forwarding engine of the system.

The MRIB shows on which interface the data packet should be accepted and on which interfaces the data packet should be forwarded, for a given (S, G) entry. Additionally, the Multicast Forwarding Information Base (MFIB) table is used during forwarding to decide on per-packet forwarding actions.



Note For forwarding information, use the **show mfib route** and **show mrrib route** commands.

Task ID

Task ID	Operations
multicast	read

Examples

The following example represents sample output from the **show pim topology summary** command:

```
RP/0/RSP0/CPU0:router# show pim vrf svpn12 topology summary
```

```
Mon Feb  2 04:07:01.249 UTC
PIM TT Summary for VRF svpn12
  No. of group ranges = 9
  No. of (*,G) routes = 8
  No. of (S,G) routes = 2
  No. of (S,G)RPT routes = 0

OSPF Mcast-intact   Not configured
  ISIS Mcast-intact Not configured
  ISIS Mcast Topology Not configured

Default RPF Table: IPv4-Unicast-default
RIB Convergence Timeout Value: 00:30:00
RIB Convergence Time Left:    00:28:32
Multipath RPF Selection is Enabled

Table: IPv4-Unicast-default
  PIM RPF Registrations = 13
  RIB Table converged

Table: IPv4-Multicast-default
  PIM RPF Registrations = 0
  RIB Table converged
```

For an example of detailed PIM topology output, see [show pim topology detail](#), on page 489.

show pim traffic

To display Protocol Independent Multicast (PIM) traffic counter information, use the **show pim traffic** command in EXEC mode.

show pim [*vrf vrf-name*] [**ipv4**] **traffic**

Syntax Description	
vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.

Command Default IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	multicast	read

Examples The following is sample output from the **show pim traffic** command that displays a row for valid PIM packets, number of hello packets, and so on:

```
RP/0/RSP0/CPU0:router# show pim traffic

PIM Traffic Counters
Elapsed time since counters cleared: 1d01h

Valid PIM Packets  Received          Sent
Hello              9207              12336
Join-Prune         1076805           531981
Data Register      14673205           0
Null Register      73205             0
```



```

Register Stop          0          14673205
Assert                0          0
Batched Assert        0          0
BSR Message           0          0
Candidate-RP Adv.     0          0

Join groups sent      0
Prune groups sent     0
Output JP bytes       0
Output hello bytes    4104

Errors:
Malformed Packets    0
Bad Checksums        0
Socket Errors        0
Subnet Errors        0
Packets dropped since send queue was full 0
Packets dropped due to invalid socket      0
Packets which couldn't be accessed        0
Packets sent on Loopback Errors           6
Packets received on PIM-disabled Interface 0
Packets received with Unknown PIM Version 0

```

This table describes the significant fields shown in the display.

Table 44: show pim traffic Field Descriptions

Field	Description
Elapsed time since counters cleared	Time (in days and hours) that had elapsed since the counters were cleared with the clear pim counters command.
Valid PIM Packets	Total PIM packets that were received and sent.
HelloJoin-PruneRegisterRegister StopAssert Bidir DF Election	Specific type of PIM packets that were received and sent.
Malformed Packets	Invalid packets due to format errors that were received and sent.
Bad Checksums	Packets received or sent due to invalid checksums.
Socket Errors	Packets received or sent due to errors from the router's IP host stack sockets.
Packets dropped due to invalid socket	Packets received or sent due to invalid sockets in the router's IP host stack.
Packets which couldn't be accessed	Packets received or sent due to errors when accessing packet memory.
Packets sent on Loopback Errors	Packets received or sent due to use of loopback interfaces.
Packets received on PIM-disabled Interface	Packets received or sent due to use of interfaces not enabled for PIM.

 show pim traffic

Field	Description
Packets received with Unknown PIM Version	Packets received or sent due to invalid PIM version numbers in the packet header.

Related Commands

Command	Description
clear pim counters , on page 409	Clears Protocol Independent Multicast (PIM) counters and statistics.

show pim tunnel info

To display information for the Protocol Independent Multicast (PIM) tunnel interface, use the **show pim tunnel info** command in EXEC mode

show pim [**vrf** *vrf-name*] [**ipv4**] **tunnel info** {*interface-unit*| **all**} [**netio**]

Syntax Description

vrf <i>vrf-name</i>	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ipv4	(Optional) Specifies IPv4 address prefixes.
<i>interface-unit</i>	Name of virtual tunnel interface that represents the encapsulation tunnel or the decapsulation tunnel.
all	Specifies both encapsulation and decapsulation tunnel interfaces.
netio	(Optional) Displays information obtained from the Netio DLL.

Command Default

IPv4 addressing is the default. If no VRF is specified, the default VRF is operational.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PIM register packets are sent through the virtual encapsulation tunnel interface from the source's first-hop designated router (DR) router to the rendezvous point (RP). On the RP, a virtual decapsulation tunnel is used to represent the receiving interface of the PIM register packets. This command displays tunnel information for both types of interfaces.

Register tunnels are the encapsulated (in PIM register messages) multicast packets from a source that is sent to the RP for distribution through the shared tree. Registering applies only to sparse mode (SM), not to Source Specific Multicast (SSM) .

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the `show pim tunnel info` command:

```
RP/0/RSP0/CPU0:router# show pim tunnel info all

Interface      RP Address      Source Address
Encapstunnel0  10.1.1.1        10.1.1.1
Decapstunnel0  10.1.1.1
```

This table describes the significant fields shown in the display.

Table 45: show pim tunnel info Field Descriptions

Field	Description
Interface	Name of the tunnel interface.
RP Address	IP address of the RP tunnel endpoint.
Source Address	IP address of the first-hop DR tunnel endpoint, applicable only to encapsulation interfaces.

show pim vrf vrf_name mdt cache

To display the data mdt cache information for the protocol independent multicast, use the **show pim vrf vrf1 mdt cache** command in the EXEC mode.

show pim vrf vrf1 mdt cache

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read

Examples

```
RP/0/RSP0/CPU0:router# show pim vrf vrf1 mdt cache
Core Source      Cust (Source, Group)      Core Data      Expires
110.110.110.110  (192.1.1.2, 232.1.1.1)      [p2mp 1/1/110.110.110.110]  never

RP/0/RSP0/CPU0:PE3#show pim vrf vrf1 mdt rsvpte remote
P2MP ID/Tunnel ID/      MDT      Cache DIP Local Vrf routes
Extended Tunnel ID      Source      Count      Entry Using cache
[p2mp 1/1/110.110.110.110]110.110.110.110 1      N      N      1
```

show pim vrf vrf_name rpf

To display RPF information for protocol independent multicast, use the **show pim vrf vrf1 rpf** command in the EXEC mode.

show pim vrf vrf1 rpf

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read

Examples

```
RP/0/RSP0/CPU0:router# show pim vrf vrf1 rpf
Table: IPv4-Unicast-default
* 192.1.1.2/32 [200/0]
  via MPLS with rpf neighbor 110.110.110.110
  Connector: 1:1:110.110.110.110, Nexthop: 110.110.110.110
```

show pim vrf vrf_name topology

To display the PIM topology table information for a specific vrf, use the **show pim vrf vrf_name topology** command in the EXEC mode.

show pim vrf vrf_name topology ip_address

Syntax Description	<i>ip_address</i>	Specifies the IP address.

Command Default	No default behavior or values

Command Modes	EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	multicast	read

Examples

```
RP/0/RSP0/CPU0:router# show pim vrf vrf1 topology 232.1.1.1
(192.1.1.2,232.1.1.1)SPT SSM Up: 05:53:44
JP: Join(00:00:09) RPF: GigabitEthernet0/0/0/1.1,192.1.1.2* Flags: MT
    tunnel-mtel          05:53:44 fwd LI LH
```

spt-threshold infinity

To change the behavior of the last-hop router to always use the shared tree and never perform a shortest-path tree (SPT) switchover, use the **spt-threshold infinity** command in PIM configuration mode. To return to the default behavior, use the **no** form of this command.

spt-threshold infinity [**group-list** *access-list*]

no spt-threshold infinity

Syntax Description	group-list <i>access-list</i> (Optional) Indicates the groups restricted by the access list.					
Command Default	The last-hop Protocol Independent Multicast (PIM) router switches to the shortest-path source tree by default.					
Command Modes	PIM configuration					
Command History	<table><tr><th>Release</th><th>Modification</th></tr><tr><td>Release 3.7.2</td><td>This command was introduced.</td></tr></table>		Release	Modification	Release 3.7.2	This command was introduced.
Release	Modification					
Release 3.7.2	This command was introduced.					
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. The spt-threshold infinity command causes the last-hop PIM router to always use the shared tree instead of switching to the shortest-path source tree. If the group-list keyword is not used, this command applies to all multicast groups.					
Task ID	<table><tr><th>Task ID</th><th>Operations</th></tr><tr><td>multicast</td><td>read, write</td></tr></table>		Task ID	Operations	multicast	read, write
Task ID	Operations					
multicast	read, write					

Examples The following example shows how to configure the PIM source group grp1 to always use the shared tree:

```
RP/0/RSP0/CPU0:router(config)# router pim
RP/0/RSP0/CPU0:router(config-pim-default-ipv4)# spt-threshold infinity group-list grp1
```


ssm

To define the Protocol Independent Multicast (PIM)-Source Specific Multicast (SSM) range of IP multicast addresses, use the **ssm** command in the appropriate configuration mode. To return to the default behavior, use the **no** form of this command.

ssm [**allow-override**| **disable**| **range** *access-list*]

no ssm [**allow-override**| **disable**| **range**]

Syntax Description

allow-override	(Optional) Allows SSM ranges to be overridden by more specific ranges.
disable	(Optional) Disables SSM group ranges.
range <i>access-list</i>	(Optional) Specifies an access list describing group ranges for this router when operating in PIM SSM mode.

Command Default

Interface operates in PIM sparse mode (PIM-SM). IPv4 addressing is the default.

Command Modes

Multicast routing configuration
Multicast routing address-family configuration
Multicast VPN configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **ssm** command performs source filtering, which is the ability of a router to report interest in receiving packets from specific source addresses (or from all but the specific source addresses) to an IP multicast address. Unlike PIM-sparse mode (SM) that uses a rendezvous point (RP) and shared trees, PIM-SSM uses information on source addresses for a multicast group provided by receivers through the local membership protocol Internet Group Management Protocol (IGMP) and is used to directly build source-specific trees.

IGMP Version 3 must be enabled on routers that want to control the sources they receive through the network.

When multicast routing is enabled, the default is PIM-SSM enabled on the default SSM range, 232/8. SSM may be disabled with the **disable** form of the command, or any ranges may be specified in an access list with the **range** form. All forms of this command are mutually exclusive. If an access list is specified, the default SSM range is not used unless specified in the access list.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to configure SSM service for the IP address range defined by access list 4, using the **ssm** command:

```
RP/0/RSP0/CPU0:router(config)# ipv4 access-list 4  
RP/0/RSP0/CPU0:router(config-ipv4-acl)# permit ipv4 any 224.2.151.141  
RP/0/RSP0/CPU0:router(config)# multicast-routing  
RP/0/RSP0/CPU0:router(config-mcast)# ssm range 4
```



Multicast Tool and Utility Commands on Cisco ASR 9000 Series Router

This chapter describes the commands used to troubleshoot multicast routing sessions on Cisco IOS XR Software.

For detailed information about multicast routing concepts, configuration tasks, and examples, refer to the *Implementing Multicast Routing on* configuration module in .

- [mrinfo, page 512](#)
- [mtrace, page 514](#)
- [sap cache-timeout, page 516](#)
- [sap listen, page 517](#)
- [show sap, page 519](#)

mrinfo

To query neighboring multicast routers peering with the local router, use the **mrinfo** command in EXEC mode.

mrinfo [**ipv4**] *host-address* [*source-address*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
host-address	Can be either the Domain Name System (DNS) name or IP address of a multicast router entered in <i>A.B.C.D</i> format. Note If omitted, the router queries itself.
<i>source-address</i>	(Optional) Source address used on multicast routing information (mrinfo) requests. If omitted, the source is based on the outbound interface for the destination.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **mrinfo** command determines which neighboring multicast routers are peering with a multicast router. You can query a multicast router with this command. The output format is identical to the multicast routed version of Distance Vector Multicast Routing Protocol (DVMRP). (The mrouted software is the UNIX software that implements DVMRP.)

Task ID

Task ID	Operations
multicast	execute

Examples

The following is sample output from the **mrinfo** command. The first line shows the multicast configuration with version number and flags Parent Multicast Agent (PMA). The flags mean that the configuration is prune capable, mtrace capable, and SNMP capable. For each neighbor of the queried multicast router, the IP address of the queried router is displayed, followed by the IP address of the neighbor. The metric (cost of connect) and the threshold (multicast time to live) are displayed. Other information is available, such as whether this router is

- Running the PIM protocol
- An IGMP querier
- A leaf router

```
RP/0/RSP0/CPU0:router# mrinfo 192.168.50.1
192.168.50.1 [version 0.37.0] [flags: PMA]:
  172.16.1.1 -> 172.16.1.1 [1/0/pim/querier/leaf]
  172.16.2.2 -> 172.16.2.2 [1/0/pim/querier/leaf]
  192.168.50.1 -> 192.168.50.1 [1/0/pim/querier]
  192.168.50.1 -> 192.168.50.101 [1/0/pim/querier]
  192.168.40.101 -> 192.168.40.1 [1/0/pim]
  192.168.40.101 -> 192.168.40.101 [1/0/pim]
```

mtrace

To trace the path from a source to a destination branch for a multicast distribution tree, use the **mtrace** command in EXEC mode.

mtrace [**ipv4**] [**vrf**] *source destination* [*group_addr*] [*resp_addr*] [*ttl*]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
vrf	(Optional) Specifies the vrf table for the route lookup.
<i>source</i>	Domain Name System (DNS) name or the IP address of the multicast-capable source. This is a unicast address of the beginning of the path to be traced.
<i>destination</i>	DNS name or address of the unicast destination. This is a unicast address of the end of the path to be traced.
<i>group_addr</i>	(Optional) DNS name or multicast address of the group to be traced. Default address is 224.2.0.1 (the group used for MBONE Audio). When address 0.0.0.0 is used, the software invokes a <i>weak mtrace</i> . A weak mtrace is one that follows the Reverse Path Forwarding (RPF) path to the source, regardless of whether any router along the path has multicast routing table state.
<i>resp_addr</i>	(Optional) DNS name or multicast address of the response address to receive response.
<i>ttl</i>	(Optional) Time-to-live (TTL) threshold for a multicast trace request. Range is 1 to 255 router hops.

Command Default

By default, this feature is disabled.
IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The trace request generated by the **mtrace** command is multicast to the multicast group to find the last-hop router to the specified destination. The trace follows the multicast path from destination to source by passing the mtrace request packet using unicast to each hop. Responses are unicast to the querying router by the first-hop router to the source. This command allows you to isolate multicast routing failures.

If no arguments are entered, the router interactively prompts you for them.

This command is identical in function to the UNIX version of **mtrace**.

Task ID

Task ID	Operations
mtrace	execute

Examples

The following is sample output from the **mtrace** command:

```
RP/0/RSP0/CPU0:router# mtrace 172.16.1.0 172.16.1.10 239.254.254.254
```

```
Type escape sequence to abort.
Mtrace from 172.16.1.0 to 172.16.1.10 via group 239.254.254.254
From source (?) to destination (?)
Querying full reverse path...
```

```
Switching to hop-by-hop:
0 172.16.1.10
-1 172.17.20.101 PIM Reached RP/Core [172.16.1.0/24]
-2 172.18.10.1 PIM [172.16.1.0/32]
-3 172.16.1.0 PIM [172.16.1.0/32]
```

```
RP/0/RSP0/CPU0:router# mtrace vrf vrf1 172.16.1.0 172.16.1.10 239.254.254.254 45.244.244.244
49
```

sap cache-timeout

To limit how long a Session Announcement Protocol (SAP) cache entry stays active in the cache, use the **sap cache-timeout** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

sap cache-timeout *minutes*

no sap cache-timeout

Syntax Description	<i>minutes</i>	Time that a SAP cache entry is active in the cache. Range is 1 to 1440.

Command Default	<i>minutes</i> : 1440 (24 hours)

Command Modes	Global configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. The sap cache-timeout command defines how long session announcements are cached by the router. Active session announcements are periodically re-sent by the originating site, refreshing the cached state in the router. The minimum interval between announcements for a single group is 5 minutes. Setting the cache timeout to a value less than 30 minutes is not recommended. Set the cache timeout to 0 to keep entries in the cache indefinitely.

Task ID	Task ID	Operations
	multicast	read, write

Examples	The following example shows the SAP cache entry timeout being configured at 10 minutes:

```
RP/0/RSP0/CPU0:router(config)# sap cache-timeout 10
```


sap listen

To configure the Session Announcement Protocol (SAP) designated router (SDR) listener on a group address, use the **sap listen** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

sap listen [*ip-address*| *name*]

no sap listen

Syntax Description

<i>ip-address</i>	(Optional) Group IP address for an address range.
<i>name</i>	(Optional) Name of a prefix for an address range.

Command Default

When no group address is configured, the SDR listener is configured on the global SAP announcement group (224.2.127.254).

Command Modes

Global configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **sap listen** command configures an SDR listener that listens to SAP announcements on the configured group address. The group IP address can be any group in the range from 224.2.128.0 to 224.2.255.255.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example configures an SDR listener for group on IP address 224.2.127.254:

```
RP/0/RSP0/CPU0:router(config)# sap listen 224.2.127.254
```

Related Commands

Command	Description
show sap, on page 519	Displays the SAP sessions learned on the configured multicast groups.

show sap

To display the Session Announcement Protocol (SAP) sessions learned on the configured multicast groups, use the **show sap** command in EXEC mode.

show sap [**ipv4**] [*group-address*] [*session-name*] [**detail**]

Syntax Description

ipv4	(Optional) Specifies IPv4 address prefixes.
<i>group-address</i>	(Optional) Group IP address or name of the session that is learned.
<i>session-name</i>	(Optional) Session name.
detail	(Optional) Provides more SAP information.

Command Default

IPv4 addressing is the default.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show sap** command displays the sessions learned on the configured multicast groups. The **detail** keyword displays verbose session information.

Use the **sap listen** command to configure the SDR listener on a group IP address.

Task ID

Task ID	Operations
multicast	read

Examples

The following is sample output from the **show sap** command. Information is summarized and shows one entry.

```
RP/0/RSP0/CPU0:router# show sap
```

```
Sap Session Table Summary
Cisco Systems, Inc
Src: 192.168.30.101, Dst: 224.2.127.254, Last Heard: 00:00:23
Total Entries : 1
```

This table describes the significant fields shown in the display.

Table 46: show sap Field Descriptions

Field	Description
Src	IP address of the host from which this session announcement was received.
Dst	Destination IP multicast group address where the announcement was sent.
Last Heard	Time (in hours, minutes, and seconds) when SAP announcements were last heard from the source.
Total Entries	Total number of entries displayed.

The following is sample output from the **show sap** command with the **detail** keyword specified for the SAP session, Cisco Systems, Inc.

```
RP/0/RSP0/CPU0:router# show sap detail
```

```
Sap Session Table
Session Name: Cisco Systems, Inc
Description: IPTV Streaming Video
Group: 225.225.225.1 TTL: 2
Announcement source: 192.30.30.101, Destination: 224.2.127.254
Created by: - 0050c200aabb 9 IN IP4 10.10.176.50
Session Permanent Attribute: packetsize:4416
Attribute: packetformat:RAW
Attribute: mux:mls
Attribute: keywds:
Attribute: author:Cisco Systems, Inc
Attribute: copyright:Cisco Systems, Inc
Media : video, Transport Protocol : udp, Port : 444
Total Entries : 1
```

This table describes the significant fields shown in the display.

Table 47: show sap detail Field Descriptions

Field	Description
Session Name	Descriptive name of the SAP session.
Description	An expanded description of the session.

Field	Description
Group	IP multicast group addresses used for this session.
Announcement source	IP address of the host from which this session announcement was received.
Destination	Destination IP multicast group address that the announcement was sent to.
Created by	Information for identifying and tracking the session announcement.
Attribute	Indicates attributes specific to the session.
Media	Indicates the media type (audio, video, or data), transport port that the media stream is sent to, transport protocol used for these media (common values are User Datagram Protocol [UDP] and Real-Time Transport Protocol [RTP]/AVP), and list of media formats that each media instance can use. The first media format is the default format. Format identifiers are specific to the transport protocol used.

Related Commands

Command	Description
sap listen , on page 517	Configures the SDR listener on a group IP address.

 show sap



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