IGMP and MLD Commands on Cisco IOS XR Software

This chapter describes the commands used to configure and monitor IPv4 and IPv6 protocol using Cisco IOS XR Software .

To use commands of this module, 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 any command, contact your AAA administrator for assistance.

The commands in this chapter apply to these protocols:

- Internet Group Management Protocol (IGMP) (Versions 1, 2, and 3)

- Multicast Listener Discovery (MLD) Protocol (Versions 1 and 2)

Note

IGMP Versions 2 and 3 are equivalent to MLD Versions 1 and 2.

IGMP Version 1 does not have a complementary MLD version.

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 *Multicast Configuration Guide for Cisco CRS Routers* .

access-group (IGMP/MLD)

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*

Syntax Description

access-list	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

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for MLD Protocol (Versions 1 and 2).

Usage Guidelines If this command is not specified in router Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ipv4 access-list mygroup permit 225.2.2.2 0.0.0.0
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface GigE 0/1/0/1
RP/0/RP0/CPU0:router(config-igmp-default-if)# access-group mygroup
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ipv4 access-list mygroup permit 225.2.2.2 0.0.0.0
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface GigE 0/1/0/1
RP/0/RP0/CPU0:router(config-igmp-default-if)# access-group mygroup
```

In the following example, an access group is configured for IPv6:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ipv6 access-list mld-acl
RP/0/RP0/CPU0:router(config-ipv6-acl)# 10 permit ipv6 any host ff3e::8000:1bb8
RP/0/RP0/CPU0:router(config-ipv6-acl)# exit
```

```
RP/0/RP0/CPU0:router(config)# router mld
RP/0/RP0/CPU0:router(config-mld)# access-group mld-acl
```

Related Commands	Command	Description
	ipv4 access-list	Defines a standard IP access list. For information, see *IP Addresses and Services Command Reference for Cisco CRS Routers*

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 *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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines — 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/RP0/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
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/RP0/CPU0:router# clear igmp counters

                  RP/0/RP0/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 52	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 *vrf-name*		(Optional) Specifies a VPN routing and forwarding (VRF) instance.
ip-address		(Optional) IP hostname or group address.
type		(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id		(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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   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
- 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/RP0/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/RP0/CPU0:router# clear igmp groups tenGigE 0/4/0/0

RP/0/RP0/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 38	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 *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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   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

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

```
RP/0/RP0/CPU0:router# clear igmp reset
```

Related Commands

Command	Description
show igmp groups, on page 38	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.

clear mld counters

To clear Multicast Listener Discovery (MLD) traffic statistics, use the **clear mld counters** command in EXEC mode.

clear mld [{**ipv6 vrf** *vrf-name* | **vrf** *vrf-name*}] **counters**

Syntax Description

ipv6	(Optional) Specifies IPv6 addressing. IPv6 is the default for MLD groups.
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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   After MLD statistics are cleared, statistics begin incrementing once again.

Task ID

Task ID	Operations
multicast	execute

Examples   The following example shows how to clear MLD traffic statistics:

```
RP/0/RP0/CPU0:router# clear mld counters
```

Note   See the **clear igmp counters** command examples for complete output.

Related Commands

Command	Description
show mld traffic, on page 65	Displays all the Multicast Listener Discovery (MLD) traffic-related counters.

clear mld group

To clear Multicast Listener Discovery (MLD) groups on one or all interfaces, use the **clear mld group** command in EXEC mode.

clear mld [{**ipv6 vrf** *vrf-name* | **vrf** *vrf-name*}] **group** [*type path-id*]

Syntax Description		
ipv6	(Optional) Specifies IPv6 addressing. IPv6 is the default for MLD groups.	
vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.	
type	(Optional) Interface type. For more information, use the question mark (?) online help function.	
path-id	(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 no group address is specified, all MLD groups are cleared.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

The **clear mld group** command is used to clear user-specified MLD membership or all MLD membership learned from external hosts. Use the *type* and *number* arguments to clear specific MLD membership, or if no interface arguments are specified, clear MLD membership from all interfaces. This command does not clear local static group members.

Task ID

Task ID	Operations
multicast	execute

Examples

The following example shows how to clear MLD groups for Packet-over-SONET/SDH (POS) interface 0/4/0/0:

```
RP/0/RP0/CPU0:router# clear mld group pos 0/4/0/0
```

Note   See the **clear igmp group** command examples for complete output.

Related Commands	Command	Description
	clear igmp group, on page 7	Clears Internet Group Management Protocol (IGMP) groups on one or all interfaces.
	show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through Multicast Listener Discovery (MLD).

clear mld reset

To clear all Multicast Listener Discovery (MLD) membership entries and reset connection in the Multicast Routing Information Base (MRIB), use the **clear mld reset** command in EXEC mode.

clear mld [{**ipv6 vrf** *vrf-name* | **vrf** *vrf-name*}] **reset**

Syntax Description	**ipv6**	(Optional) Specifies IPv6 addressing. IPv6 is the default for MLD groups.
	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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   Every MLD group membership that MLD learns is downloaded to the MRIB database.

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

> **Note**   This command is reserved to force synchronization of MLD and MRIB entries when communication between the two components is malfunctioning.

Task ID

Task ID	Operations
multicast	execute

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

```
RP/0/RP0/CPU0:router# clear igmp mld reset
```

Related Commands

Command	Description
show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through MLD.
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 or Multicast Listener Discovery (MLD) Version 2, 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**}]

Syntax Description		
	access-list	(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 or MLD configuration mode, then explicit host tracking is disabled.

Command Modes

IGMP VRF configuration

IGMP interface configuration

MLD configuration

MLD interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	The **enable** keyword was removed.
	The **disable** keyword was removed from IGMP and MLD configuration modes.

Usage Guidelines

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 or MLD membership of hosts, use the **show igmp groups** or the **show mld 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 or MLD configuration mode, parameters are inherited by all new and existing interfaces. However, you can override these parameters on individual interfaces from IGMP or router MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# explicit-tracking router1
RP/0/RP0/CPU0:router(config-igmp)# interface GigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-igmp-default-if)# explicit-tracking disable
```

Related Commands

Command	Description
show igmp groups, on page 38	Displays the multicast groups that are directly connected to the router and that were learned through Internet Group Management Protocol (IGMP).
show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through Multicast Listener Discovery (MLD).

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*]

Syntax Description	*group-address*	Address of the multicast group. This is a multicast IP address group in either IPv4 or IPv6 prefixing format: • IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format *A.B.C.D* . • IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv6 host in the form of *X:X::X* .
	source-address	(Optional) Source address of the multicast group to include in either IPv4 or IPv6 prefixing format: • IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format *A.B.C.D* . • IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv6 host in the form of *X:X::X* .

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

Command Modes IGMP interface configuration

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for Multicast Listener Discovery (MLD) Protocol (Versions 1 and 2).
Release 3.5.0	The **include** *include-address* and **exclude** *exclude-address* keywords and arguments have been removed.

Usage Guidelines 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 or MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface GigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-igmp-default-if)# join-group 225.2.2.2
```

Related Commands

Command	Description
ping	Checks host reachability and network connectivity on IP networks. For information, see *IP Addresses and Services Command Reference for Cisco CRS Routers*.

maximum groups

To configure the maximum number of groups used by Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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*

Syntax Description

number	Maximum number of groups accepted by a router. Range is 1 to 75000.

Command Default

number : 50000

Command Modes

IGMP configuration

IGMP VRF configuration

MLD configuration

MLD VRF configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for MLD Protocol (Versions 1 and 2).

Usage Guidelines

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.

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/RP0/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-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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# maximum groups 10
RP/0/RP0/CPU0:router(config-igmp)# commit

% Failed to commit one or more configuration items during an atomic operation, n
o changes have been made. Please use 'show configuration failed' to view the errors

RP/0/RP0/CPU0:router# show configuration failed

[!! CONFIGURATION FAILED DUE TO SEMANTIC ERRORS
router igmp
maximum groups 10
!!% Invalid argument: The desired new maximum for the number of groups 10 must be equal or
 larger than the present number of groups, which is 61

RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# maximum groups 65
RP/0/RP0/CPU0:router(config-igmp)# commit

RP/0/RP0/CPU0:routerMay 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/RP0/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         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
```

Related Commands

Command	Description
maximum groups-per-interface, on page 21	Configures the maximum number of groups for each interface accepted by a router.
show igmp summary, on page 48	Displays group membership information for Internet Group Management Protocol (IGMP).
show mld summary, on page 63	Displays group membership information for Multicast Listener Discovery (MLD).

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*

Syntax Description	*number* Maximum number of groups accepted by a router for each interface. Range is 1 to 40000.

Command Default *number* : 20000

Command Modes IGMP configuration

IGMP VRF configuration

IGMP interface configuration

Router MLD configuration

Router MLD VRF configuration

Router MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for Multicast Listener Discovery (MLD) Protocol (Versions 1 and 2).
Release 3.5.0	The command was changed from **maximum groups per-interface** to **maximum groups-per-interface** .

Usage Guidelines 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 or MLD 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/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# maximum groups-per-interface 5
RP/0/RP0/CPU0:router(config-igmp)# commit


RP/0/RP0/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
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 Packet-over-SONET/SDH (POS) interface 0/4/0/0, which is set to 4000:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# maximum groups-per-interface 3000
RP/0/RP0/CPU0:router(config-igmp)# interface POS 0/4/0/0
RP/0/RP0/CPU0:router(config-igmp-default-if)# maximum groups-per-interface 4000
```

Related Commands	Command	Description
	maximum groups, on page 18	Configures the maximum number of groups used by Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD).
	show igmp summary, on page 48	Displays group membership information for Internet Group Management Protocol (IGMP).

mLDP OAM

To add OAM functions to mLDP, use the **mLDP OAM** command.

To execute ping or trace for a specified mLDP tree, use the **ping mpls mldp** and **trace mpls mldp** commands in the Global Configuration mode.

ping mpls mldp [**p2mp** | **mp2mp**] *root opaque_types* [*options*]
trace mpls mldp [**p2mp** | **mp2mp**] *root opaque_types* [*options*]

Both commands use the same syntax.

Syntax Description		
	p2mp	**mp2mp**	Type of tree on which the ping is performed.
	root	Address of the root in the tree.
	opaque_types	Set of opaque types and their subsequent parameters : • ipv4 \<rd\> \<source\> \<group\> [options] • ipv6 \<rd\> \<source\> \<group\> [options] • hex \<opaque type\> \<opaque value\> [options] • mdt \<vpnid\> \<mdt_num\> [options] • global-id \<global identifier\> [options]
	options	Regular ping/trace options.

Command Default No default behavior or values.

Command Modes Global Configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Task ID

Task ID	Operation
mpls	read, write

Example

```
RP/0/RP0/CPU0:router(config)# ping mpls mldp p2mp ipv4
RP/0/RP0/CPU0:router(config)# trace mpls mldp p2mp ipv4
```

nsf lifetime (IGMP/MLD)

To configure the maximum time for the nonstop forwarding (NSF) timeout on the Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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*

Syntax Description

seconds	Maximum time for NSF mode. Range is 10 to 3600 seconds.

Command Default

seconds : 60

Command Modes

IGMP configuration

IGMP VRF configuration

MLD configuration

MLD VRF configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for MLD Protocol (Versions 1 and 2).

Usage Guidelines

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 Auto-RP and the Session Announcement Protocol (SAP) Listener) and updates the MRIB.

Note
The NSF process for MLD under IPv6 is as described above for IGMP under IPv4.

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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/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 44	Displays the state of NSF operation in IGMP.
show mfib nsf	Displays the state of NSF operation for the MFIB line cards.
show mld nsf, on page 60	Displays the state of NSF operation in MLD.

query-interval

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

query-interval *seconds*

Syntax Description

seconds	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 or MLD configuration mode.

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

Command Modes

IGMP VRF configuration

IGMP interface configuration

MLD configuration

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for MLD Protocol (Versions 1 and 2).

Usage Guidelines

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 or MLD 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 or MLD 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, and MLD Versions 1 and 2, 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 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 or MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface gigabitEthernet

0/1/0/0
RP/0/RP0/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	Configures the timeout value before the router takes over as the querier for the interface.
show igmp groups, on page 38	Displays the multicast groups that are directly connected to the router and that were learned through IGMP.
show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through MLD.

query-max-response-time

To configure the maximum response time advertised in Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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*

Syntax Description	*seconds*	Maximum response time, in seconds, advertised in IGMP or MLD 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 or MLD configuration mode.

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

Command Modes

IGMP VRF configuration

IGMP interface configuration

MLD configuration

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for MLD Protocol (Versions 1 and 2).

Usage Guidelines

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 or MLD 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 or MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0
RP/0/RP0/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 38	Displays the multicast groups that are directly connected to the router and that were learned through IGMP.
show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through MLD.

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*

Syntax Description	*seconds*	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

MLD configuration

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	Support was added for Multicast Listener Discovery (MLD) Protocol (Versions 1 and 2).

Usage Guidelines 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 or MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-igmp-default-if)# query-timeout 30
```

Related Commands

Command	Description
query-interval, on page 27	Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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*

Syntax Description	*count* 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

MLD configuration

MLD interface configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines   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/RP0/CPU0:router(config)# configure
RP/0/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# robustness-count 2
```

router

To disable or enable Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) 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**}

Syntax Description		
	disable	Turns off IGMP or MLD membership tracking.
	enable	Turns on IGMP or MLD 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

MLD interface configuration

Command History

Release	Modification
Release 2.0	This command was introduced.

Usage Guidelines
The **router** command is used to enable and disable the IGMP or MLD router functionality on a specific interface. For instance, IGMP or MLD stops queries from an interface when the router functionality is disabled on that interface. Disabling IGMP or MLD 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 or MLD interfaces that have been previously enabled through the **multicast-routing** command.

Task ID

Task ID	Operations
multicast	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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface gigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-igmp-default-if)# router enable
```

	Command	Description
Related Commands	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

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 2.0	This command was introduced.

Usage Guidelines 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)#
```

Related Commands

Command	Description
interface all disable	Disables IGMP or MLD 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.

router mld

To enter router Multicast Listener Discovery (MLD) Protocol configuration mode, use the **router mld** command in

global

configuration mode. To return to the default behavior, use the **no** form of this command.

router mld

Syntax Description	This command has no keywords or arguments.
Command Default	No default behavior or values
Command Modes	Global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

> **Note**
>
> The MLD process is turned on when the **router mld** command or the **multicast-routing** command is initiated.

Task ID

Task ID	Operations
multicast	read, write

Examples

The following example shows how to enter MLD configuration mode:

```
RP/0/RP0/CPU0:router(config)# router mld
RP/0/RP0/CPU0:router(config-mld)#
```

Related Commands

Command	Description
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 [**old-output**] [**vrf** *vrf-name*] **groups** [{*group-address* | *type* *interface-path-id* | **not-active** | **summary**}] [**detail**] [**explicit**]

Syntax Description	**old-output**	(Optional) Displays the previous show output—available for backward compatibility.
	vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
	group-address	(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.
	type	(Optional) Interface type. For more information, use the question mark (?) online help function.
	interface-path-id	(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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   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/RP0/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 40	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 [**old-output**] [**vrf** *vrf-name*] **interface** [{*type inteface-path-id* | **state-on** | **state-off**}]

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.	
type	(Optional) Interface type. For more information, use the question mark (?) online help function.	
interface-path-id	(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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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/RP0/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 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 27	Configures the frequency at which Cisco IOS XR software sends IGMP host-query messages.

Command	Description
router, on page 34	Disables or enables MLD or 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 [**old-output**] [**vrf** *vrf-name*] **nsf**

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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   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/RP0/CPU0:router# show igmp nsf


IP IGMP Non-Stop Forwarding Status
:
 Multicast routing state: Non-Stop Forwarding Activated

NSF Lifetime: 00:01:00
NSF
Time Remaining:      00:
00:
06
```

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/MLD) , on page 25	Configures the NSF timeout value for the IGMP or MLD 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 mrib nsf	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show igmp nsr

To display the nonstop routing (NSR) information in Internet Group Management Protocol (IGMP), use the **show igmp nsr** command in EXEC mode

.

show igmp [{ **ipv4**| **ipv6** }] **ipv4**| **ipv6** **nsr**

Syntax Description

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 5.2.2	This command was introduced.

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

Task ID

Task ID	Operations
multicast	read

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

```
RP/0/RP0/CPU0:router# show igmp nsr

IGMP NSR Data :-
NSR State                   : Not Ready (uptime 4w0d)
Converged with collaborators  : Y
Partner connection state    : Not-coverged/Down
RMF Notif done              : Y
Last RMF ready notified     : Never [0]
Last RMF not ready notifed  : 4w0d [1]
Last partner process conn up  : Never [0]
Last partner process conn down : Never [0]
```

This table describes the significant fields shown in the display.

Table 4: show igmp nsr Field Descriptions

Field	Description
NSR State	Multicast Non-Stop Routing State: Ready or Not Ready

Field	Description
Converged with collaborators	Yes or No
Partner connection state	Converged/Yes or Non-converged/No
RMF Notif done	RMF notification whether activated: Yes or No
Last RMF ready notified	The Time when the last RMF ready notification was received: Yes, No, or Never. The number in the brackets indicate the number of times the RMF ready notification was received.
Last RMF not ready notified	The Time when the last RMF not ready notification was received: Yes, No, or Never. The number in the brackets indicate the number of times the RMF ready notification was received.

Related Commands

Command	Description
show msdp nsr	Displays the state of NSR operation for MSDP.
show mrib nsr	Displays the state of NSR operation in MRIB.
show pim nsr	Displays the state of NSR 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 [**old-output**] [**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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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/RP0/CPU0:router# 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
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
```

This table describes the significant fields shown in the display.

Table 5: 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 38	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.
vrf-name	(Optional) Specifies the name of the specific VRF instance.
group-address	(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 3.7.0	This command was introduced.

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/RP0/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 [**old-output**] [**vrf** **vrf-name**] **traffic**

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 2.0	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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/RP0/CPU0:router# show igmp traffic

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

                                Received        Sent
Valid IGMP Packet                  2784         5576
Queries                               0         2784
Reports                            2784         2792
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 both the **show igmp traffic** and **show mld traffic** command, since they are identical. For information about the **show mld traffic** command, see

Table 6: show igmp traffic and show mld traffic Field Descriptions

Field	Description
Valid IGMP/MLD 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 that a neighboring interface no longer has multicast reception state for a particular group.
Mtrace packets	(IGMP only) 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	(IGMP only) 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.
PIM packets	(IGMP only) 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. **Note** MLD checksum verification is performed by the ICMPv6 protocol; this counter, therefore, never increments in MLD.
Socket Errors	Total number of read and write failures on the protocol socket.

Field	Description
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 auxilary 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.

Related Commands

Command	Description
show pim traffic	Displays PIM traffic counter information.
show mld traffic, on page 65	Displays all the Multicast Listener Discovery (MLD) traffic-related counters.

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

ip_address	Specifies the IP address or group address.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
multicast	read

```
RP/0/RP0/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
```

show mld groups

To display the multicast groups that are directly connected to the router and that were learned through Multicast Listener Discovery (MLD), use the **show mld groups** command in EXEC mode

.

show mld [**old-output**] [**vrf** *vrf-name*] **groups** [{*group-address* | *type path-id* | **not-active** | **summary**}] [**detail**] [**explicit**]

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.	
group-address	(Optional) Name or address of the multicast group. Name is as defined in the Domain Name System (DNS) hosts table. Address is a multicast IP address in IPv6 format.	
type	(Optional) Interface type. For more information, use the question mark (?) online help function.	
path-id	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.	
not-active	(Optional) Displays group joins that are not processed.	
summary	(Optional) Displays the total number of (* , G) and (S, G) states in MLD.	
detail	(Optional) Displays detail information such as MLD 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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines   If you omit all optional arguments, the **show mld 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 mld groups** command:

```
RP/0/RP0/CPU0:router# show mld groups

MLD Connected Group Membership

POS0/2/0/0

Group Address : ff02::2
Last Reporter : fe80::b000:ff:fe00:fb00
        Uptime : 01:56:39
       Expires : never
Group Address : ff02::d
Last Reporter : fe80::b000:ff:fe00:fb00
        Uptime : 01:56:39
       Expires : never
Group Address : ff02::16
Last Reporter : fe80::b000:ff:fe00:fb00
        Uptime : 01:56:39
       Expires : never
```

Table 1: show igmp groups Field Descriptions, on page 39 describes the significant fields shown in the display.

Related Commands

Command	Description
show mld interface, on page 58	Displays Multicast Listener Discovery (MLD) multicast-related information about an interface.

show mld interface

To display Multicast Listener Discovery (MLD) multicast-related information about an interface, use the **show mld interface** command in EXEC mode

.

show **mld** [**old-output**] [**vrf** *vrf-name*] **interface** [{*type* *path-id* | **state-on** | **state-off**}]

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.	
type	(Optional) Interface type. For more information, use the question mark (?) online help function.	
instance	(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 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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

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

Task ID

Task ID	Operations
multicast	read

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

```
RP/0/RP0/CPU0:router# show mld interface

Loopback0 is up, line protocol is up
  Internet address is fe80::5000:ff:fe00:5c00
  MLD is enabled on interface
```

```
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  MLD activity: 3 joins, 0 leaves
  MLD querying router is fe80::5000:ff:fe00:5c00 (this system)
TenGigE0/5/0/2 is up, line protocol is up
  Internet address is fe80::215:c6ff:fe3e:8c85
  MLD is enabled on interface
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  MLD activity: 5 joins, 0 leaves
  MLD querying router is fe80::215:c6ff:fe3e:8c85 (this system)
TenGigE0/5/0/3 is up, line protocol is up
  Internet address is fe80::215:c6ff:fe3e:8c86
  MLD is enabled on interface
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  MLD activity: 5 joins, 0 leaves
  MLD querying router is fe80::215:c6ff:fe3e:8c86 (this system)
TenGigE0/5/0/3.4 is up, line protocol is up
  Internet address is fe80::215:c6ff:fe3e:8c86
  MLD is enabled on interface
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  MLD activity: 3 joins, 0 leaves
  MLD querying router is fe80::215:c6ff:fe3e:8c86 (this system)
TenGigE0/5/0/3.5 is up, line protocol is up
  Internet address is fe80::215:c6ff:fe3e:8c86
  MLD is enabled on interface
  Current MLD version is 2
  MLD query interval is 125 seconds
  MLD querier timeout is 255 seconds
  MLD max query response time is 10 seconds
  Last member query response interval is 1 seconds
  MLD activity: 3 joins, 0 leaves
  MLD querying router is fe80::215:c6ff:fe3e:8c86 (this system)
```

Table 2: show igmp interface Field Descriptions, on page 42 describes the significant fields shown in the display.

	Command	Description
Related Commands	**address**	Sets a primary or secondary IP address for an interface.
	query-interval, on page 27	Configures the frequency at which Cisco IOS XR Software sends MLD host-query messages.
	router, on page 34	Disables or enables MLD or IGMP membership tracking.

show mld nsf

To display the state of the nonstop forwarding (NSF) operation in Multicast Listener Discovery (MLD), use the **show mld nsf** command in EXEC mode

.

show mld [**old-output**] [**vrf** *vrf-name*] **nsf**

| 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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines The **show mld nsf** command displays the current multicast NSF state for MLD. 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 MLD 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 mld nsf** command:

```
RP/0/RP0/CPU0:router# show mld nsf

IP MLD Non-Stop Forwarding Status:
Multicast routing state: Non-Stop Forwarding Activated
NSF Lifetime: 00:01:00
NSF Time Remaining: 00:00:06
```

Table 3: show igmp nsf Field Descriptions, on page 45 describes the significant fields shown in the display.

Related Commands

Command	Description
nsf (multicast)	Enables NSF capability for the multicast routing system.
nsf lifetime (IGMP/MLD) , on page 25	Configures the NSF timeout value for the IGMP or MLD process.

Command	Description
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 mrib nsf	Displays the state of NSF operation in the MRIB.
show pim nsf	Displays the state of NSF operation for PIM.

show mld ssm map

To display the source-specific mapping (SSM) state in Multicast Listener Discovery (MLD), use the **show mld ssm map** command in EXEC mode.

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

Syntax Description		
vrf *vrf-name*	(Optional) Specifies a VPN routing and forwarding (VRF) instance.
group-address	(Optional) 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 3.7.0	This command was introduced.

Usage Guidelines   No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
multicast	read

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

```
RP/0/RP0/CPU0:router# show mld ssm map 2001:0DB8::/48


2001:0DB8::/48 is static with 1 source
```

show mld summary

To display group membership information for Multicast Listener Discovery (MLD), use the **show mld summary** command in EXEC mode.

show mld [**old-output**] [**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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

The **show mld 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 MLD members and the maximum number of groups that can become members on each interface:

```
RP/0/RP0/CPU0:router# show mld summary

MLD summary

Robustness Value 2
No. of Group x Interfaces 39
Maximum number of Group x Interfaces 4500

Supported Interfaces   : 12
Unsupported Interfaces : 1
Enabled Interfaces     : 2
Disabled Interfaces    : 3

Interface              Grp No    Max Grp No
Loopback0              11        25000
```

```
Loopback1                 10        25000
Loopback2                 9         25000
Loopback3                 9         25000
```

Table 5: show igmp summary Field Descriptions, on page 50 describes the significant fields shown in the display.

Related Commands	Command	Description
	show mld groups, on page 56	Displays the multicast groups that are directly connected to the router and that were learned through Multicast Listener Discovery (MLD).

show mld traffic

To display all the Multicast Listener Discovery (MLD) traffic-related counters, use the **show mld traffic** command in EXEC mode .

show mld [**old-output**] [**vrf** *vrf-name*] **traffic**

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 3.2	This command was introduced.
Release 3.5.0	The **vrf** *vrf-name* keyword and argument were added.

Usage Guidelines

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

Task ID

Task ID	Operations
multicast	read

Examples

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

```
RP/0/RP0/CPU0:router# show mld traffic

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

                                 Received         Sent
Valid MLD Packet                    10             10
Queries                              2              2
Reports                              8              8
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
```

Table 6: show igmp traffic and show mld traffic Field Descriptions, on page 53 describes the significant fields shown in the display.

Related Commands

Command	Description
show pim traffic	Displays PIM traffic counter information.

ssm map

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 or to configure DNS mapping for PIM-SSM sources to a set of SSM groups, use the **ssm map** 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* | **query** **dns** }

Syntax Description	*source-address*	PIM-SSM source address to be used to create a static mapping.
	access-list	ACL specifying the groups to be used to create a static mapping.
	query	Configure a mapping of sources to groups quering external database.
	dns	Configure a DNS mapping for sources to a set of SSM groups.

Command Default

Legacy host membership reports in the SSM group range are discarded and DNS-based SSM mapping is not enabled.

Command Modes

IGMP VRF configuration

MLD configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced.
Release 5.3.2	The keywords "query" and "DNS" were introduced to configure DNS-based SSM mapping.

Usage Guidelines

PIM-SSM requires the use of IGMPv3 (IPv4) or MLD (IPv6) to determine local memberships. Under normal operating conditions, IGMP and MLD discard 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/RP0/CPU0:router(config)# configuration
RP/0/RP0/CPU0:router(config)# router igmp
```

```
RP/0/RP0/CPU0:router(config-igmp)# ssm map static 10.0.0.1 mc2
RP/0/RP0/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*]]

Syntax Description		
	group-address	IP address of the multicast group in either IPv4 or IPv6 prefixing format:
		• IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format *A.B.C.D* .
		• IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv6 host in the form of *X:X::X* .
	inc-mask *mask*	(Optional) Specifies a mask for the increment range. This is an IP address expressed range in either IPv4 or IPv6 prefixing 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 *A.B.C.D* .
		• IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv6 host in the form of *X:X::X* .
		Note This mask is used with the group address to generate subsequent group addresses.
	count *cnt*	(Optional) Specifies a number of group addresses to generate using the increment mask. Range is 1 to 512.
	source address	(Optional) Source address of the multicast group to include in either IPv4 or IPv6 prefixing format:
		• IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv4 host in the format *A.B.C.D* .
		• IP address as defined in the Domain Name System (DNS) hosts table or with the domain IPv6 host in the form of *X:X::X* .

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

Command Modes   IGMP interface configuration

MLD interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines

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.

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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# interface GigE 0/1/0/0
RP/0/RP0/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) or Multicast Listener Discovery (MLD) 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**}

Syntax Description	1 Specifies IGMP Version 1. Available for IGMP and MLD.
	2 Specifies IGMP Version 2. Available for IGMP and MLD.
	3 Specifies IGMP Version 3. Available for IGMP only.

Command Default

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

If this command is not specified in IGMP or MLD configuration mode, IGMP uses Version 3 and MLD uses Version 1.

Command Modes

IGMP configuration

IGMP VRF configuration

IGMP interface configuration

MLD configuration

MLD VRF configuration

MLD interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.5.0	This command was supported in the following configuration modes: • IGMP interface configuration • MLD interface configuration

Usage Guidelines

All routers on the subnet must be configured with the same version of IGMP or MLD. 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 or MLD 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 or MLD Version 1 or 2.

| Note | If you configure this command in IGMP or MLD 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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# version 3
```

Related Commands

Command	Description
query-max-response-time, on page 29	Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) or Multicast Listener Discovery (MLD) queries.
query-timeout, on page 31	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 and MLD 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*

Syntax Description	*vrf-name* Name of the VRF instance.

Command Default   No default behavior or values

Command Modes   IGMP configuration

MLD configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced.

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

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

> **Note**   Although the **vrf** command is available in MLD routing configuration submode, MLD does not support virtual routing and forwarding. Its function there is simply to allow both routing protocols to share the same configuration code.

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/RP0/CPU0:router(config)# router igmp
RP/0/RP0/CPU0:router(config-igmp)# vrf
vrf_1
RP/0/RP0/CPU0:router(config-igmp-vrf_1)#
```