



## MLD Snooping

Multicast Listener Discovery (MLD) snooping provides a way to constrain multicast traffic at Layer 2. By snooping the MLD membership reports sent by hosts in the bridge domain, the MLD snooping application can set up Layer 2 multicast forwarding tables to deliver traffic only to ports with at least one interested member, significantly reducing the volume of multicast traffic.

MLD snooping uses the information in MLD membership report messages to build corresponding information in the forwarding tables to restrict IPv6 multicast traffic at Layer 2. The forwarding table entries are in the form <Route, OIF List>, where:

- Route is a <\*, G> route or <S, G> route.
- OIF List comprises all bridge ports that have sent MLD membership reports for the specified route plus all multicast router (mrouter) ports in the bridge domain.

For more information regarding MLD snooping, refer the *Multicast Configuration Guide for Cisco NCS 540 Series Routers*.

- [Prerequisites for MLD Snooping, on page 2](#)
- [Restrictions for MLD Snooping, on page 2](#)
- [Advantages of MLD Snooping, on page 2](#)
- [High Availability \(HA\) features for MLD, on page 2](#)
- [Bridge Domain Support for MLD, on page 3](#)
- [Multicast Router and Host Ports, on page 3](#)
- [Multicast Router Discovery for MLD, on page 3](#)
- [Multicast Traffic Handling for MLD, on page 4](#)
- [Multicast Listener Discovery over BVI, on page 5](#)
- [IPv6 Multicast Listener Discovery Snooping over BVI, on page 7](#)
- [Creating a MLD Snooping Profile, on page 8](#)
- [Deactivating MLD Snooping on a Bridge Domain, on page 9](#)
- [Configuring Static Mrouter Ports \(MLD\), on page 10](#)
- [Configuring Router Guard \(MLD\), on page 11](#)
- [Configuring Immediate-leave for MLD, on page 12](#)
- [Configuring Internal Querier for MLD, on page 12](#)
- [Configuring Static Groups for MLD, on page 13](#)
- [Configuring MLD Snooping, on page 15](#)
- [Configuring MLD Snooping on Ethernet Bundles, on page 16](#)

## Prerequisites for MLD Snooping

- The network must be configured with a layer2 VPN.
- You must be in a user group associated with a task group that includes the proper task IDs. The command reference guides include the task IDs required for each command. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

## Restrictions for MLD Snooping

Following are the restrictions (features that are not supported):

- MLD Snooping is supported only on L2VPN bridge domains.
- Explicit host tracking.
- Multicast Admission Control.
- Security filtering.
- Report rate limiting.
- Multicast router discovery.
- IPv6 multicast is not supported for a multicast source that is behind the BVI interface. For example, the below configuration is not supported:

```
l2vpn
bridge group 1
  bridge-domain 1
    multicast-source ipv6
    mld snooping profile grpl
```

## Advantages of MLD Snooping

- In its basic form, it reduces bandwidth consumption by reducing multicast traffic that would otherwise flood an entire VPLS bridge domain.
- With the use of some optional configurations, it provides security between bridge domains by filtering the MLD reports received from hosts on one bridge port and preventing leakage towards the hosts on other bridge ports.

## High Availability (HA) features for MLD

MLD supports the following HA features:

- Process restarts
- RP Failover

- Stateful Switch-Over (SSO)
- Non-Stop Forwarding (NSF)—Forwarding continues unaffected while the control plane is restored following a process restart or route processor (RP) failover.
- Line card online insertion and removal (OIR)

## Bridge Domain Support for MLD

MLD snooping operates at the bridge domain level. When MLD snooping is enabled on a bridge domain, the snooping functionality applies to all ports under the bridge domain, including:

- Physical ports under the bridge domain.
- Ethernet flow points (EFPs)—An EFP can be a VLAN, VLAN range, list of VLANs, or an entire interface port.
- Ethernet bundles—Ethernet bundles include IEEE 802.3ad link bundles and Cisco EtherChannel bundles. From the perspective of the MLD snooping application, an Ethernet bundle is just another EFP. The forwarding application in the Cisco NCS 540 Series Routers randomly nominates a single port from the bundle to carry the multicast traffic.

## Multicast Router and Host Ports

MLD snooping classifies each port as one of the following:

- Multicast router ports (mrouter ports)—These are ports to which a multicast-enabled router is connected. Mrouter ports are usually dynamically discovered, but may also be statically configured. Multicast traffic is always forwarded to all mrouter ports, except when an mrouter port is the ingress port.
- Host ports—Any port that is not an mrouter port is a host port.

## Multicast Router Discovery for MLD

MLD snooping discovers mrouter ports dynamically. You can also explicitly configure a port as an emrouter port.

- Discovery- MLD snooping identifies upstream mrouter ports in the bridge domain by snooping mld query messages and Protocol Independent Multicast Version 2 (PIMv2) hello messages. Snooping PIMv2 hello messages identifies mld nonqueriers in the bridge domain.
- Static configuration—You can statically configure a port as an mrouter port with the **mrouter** command in a profile attached to the port. Static configuration can help in situations when incompatibilities with non-Cisco equipment prevent dynamic discovery.

## Multicast Traffic Handling for MLD

The following tables describe the traffic handling behavior by MLD mrouter ports and host ports.

**Table 1: Multicast Traffic Handling for a MLDv1 Querier**

Traffic Type	Received on MRouter Ports	Received on Host Ports
IP multicast source traffic	Forwards to all mrouter ports and to host ports that indicate interest.	Forwards to all mrouter ports and to host ports that indicate interest.
MLD general queries	Forwards to all ports.	—
MLD group-specific queries	Forwards to all other mrouter ports.	Dropped
MLDv1 joins	Examines (snoops) the reports. <ul style="list-style-type: none"> <li>• If report suppression is enabled, forwards first join for a new group or first join following a general query for an existing group.</li> <li>• If report suppression is disabled, forwards on all mrouter ports.</li> </ul>	Examines (snoops) the reports. <ul style="list-style-type: none"> <li>• If report suppression is enabled, forwards first join for a new group or first join following a general query for an existing group.</li> <li>• If report suppression is disabled, forwards on all mrouter ports.</li> </ul>
MLDv2 reports	Ignores	Ignores
MLDv1 leaves	Invokes last member query processing.	Invokes last member query processing.

**Table 2: Multicast Traffic Handling for a MLDv2 Querier**

Traffic Type	Received on MRouter Ports	Received on Host Ports
IP multicast source traffic	Forwards to all mrouter ports and to host ports that indicate interest.	Forwards to all mrouter ports and to host ports that indicate interest.
MLD general queries	Forwards to all ports.	—
MLD group-specific queries	If received on the querier port floods on all ports.	—
MLDv1 joins	Handles as MLDv2 IS_EX{} reports.	Handles as MLDv2 IS_EX{} reports.
MLDv2 reports	<ul style="list-style-type: none"> <li>• If proxy reporting is enabled—For state changes or source-list changes, generates a state change report on all mrouter ports.</li> <li>• If proxy reporting is disabled—Forwards on all mrouter ports.</li> </ul>	<ul style="list-style-type: none"> <li>• If proxy reporting is enabled—For state changes or source-list changes, generates a state change report on all mrouter ports.</li> <li>• If proxy reporting is disabled—Forwards on all mrouter ports.</li> </ul>

Traffic Type	Received on MRouter Ports	Received on Host Ports
MLDv1 leaves	Handles as MLDv2 IS_IN{} reports.	Handles as MLDv2 IS_IN{} reports.

## Multicast Listener Discovery over BVI

Multicast IPv6 packets received from core, which has BVI as forwarding interface, is forwarded to access over snooped L2 AC or interface.



### Note

- As per MLDv2 RFC recommendation the MLDv2 reports should carry the Hop-by-Hop options header for the reports to get punted up.
- MLDv2 is supported over BVI only when BVI is configured as a forwarding interface.

### MLD and BVI Overview

Routers use the Internet Group Management Protocol (IGMP) (IPv4) and Multicast Listener Discovery (MLD) (IPv6) to learn whether members of a group are present on their directly attached subnets. Hosts join multicast groups by sending IGMP or MLD report messages.

MLDv1 and MLDv2 are supported on NCS 540. However, MLDv2 is enabled when you configure MLD by default.

MLDv2 shares feature parity with IGMPv3 with respect to all supported interface types with the exception of PPOE and subinterfaces. MLDv2 enables a node to report interest in listening to packets only from specific multicast source addresses.

A BVI interface is a routed interface representing a set of interfaces (bridged) in the same L2 broadcast domain. MLD join messages coming in or out of this broadcast domain passes through the BVI interface.

## Configuration

This sample configuration shows how to configure BVI interface to join a multicast group and statically forward multicast traffic using MLDv2:

```
router# config
router (config)# router mld
router (config-mld)# vrf BVI
router (config-mld-vrf)# interface BVI100
router (config-mld-vrf-int)# join-group fe32::1 192::4
router (config-mld-vrf-int)# static-group fe32::2 192::4
router (config-mld-vrf-int)# commit
router (config-mld-vrf-int)# exit
router (config-mld-vrf)# exit
router (config-mld)# exit
router (config)# exit
```

### Verification

Use the command **show mld bvi stats** and **show mld group bvi < num >** to verify the MLDv2 over BVI configuration:

```

router# show mld bvi stats
Thu Nov 22 13:58:34.474 UTC
AIPC buffers received           : 8365
AIPC buffer released           : 8365
AIPC messages send blocked     : 0
AIPC buffer release failed     : 0
AIPC NULL buffer handles      : 0
AIPC open notifications received : 0
AIPC close notifications received : 0
AIPC error notifications received : 0
AIPC LWM notifications received : 0
AIPC input waiting notifications received : 8308
AIPC send status notifications received : 2485
AIPC publish notifications received : 0
AIPC queue full notifications received : 0
AIPC output notifications received : 0
AIPC connect notifications received : 1
IGMP protocol messages received : 8365
IGMP Mrouter Add messages received : 0
IGMP Mrouter Delete messages received : 0
IGMP Mrouter Sweep messages received : 1
IGMP Mrouter Add messages transmitted : 13
IGMP Mrouter Delete messages transmitted : 22
IGMP Mrouter Sweep messages transmitted : 0
IGMP Mrouter Unknown messages received : 0
IGMP Mrouter Unknown messages transmitted : 0
AIPC transmission error       : 0
AIPC buffers transmited      : 0
IGMP protocol buffers transmitted : 2482
IGMP Mrouter buffers transmitted : 3
IGMP Unknown buffers transmited : 0
IGMP WTX Msgs received      : 0
IGMP WTX Msgs sent          : 0
IGMP WTX Msgs sent to protocol : 0
IGMP WTX Msgs dropped due DC : 99264
IGMP WTX Msgs dropped no memory : 0
IGMP WTX Msgs freed         : 0

```

```

router# show mld group bvi 100
Thu Nov 22 13:58:52.055 UTC
MLD Connected Group Membership

```

BVI100

```

Group Address : ff02::2
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 03:31:07
  Expires : never
Group Address : ff02::d
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 03:31:07

```

```

show mld group bvi 100
Thu Nov 22 13:58:52.055 UTC
MLD Connected Group Membership

```

BVI100

```

Group Address : ff02::2
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 03:31:07
  Expires : never
Group Address : ff02::d
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 03:31:07

```

```

Expires : never
Group Address : ff02::16
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 03:31:07
  Expires : never
Group Address : ff02::1:ff01:1
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 01:59:20
  Expires : 00:04:01
Group Address : ff02::1:ff3d:b73f
Last Reporter : fe80::1a33:9dff:fe3d:b73f
  Uptime : 01:59:20
  Expires : 00:04:01
Group Address : ff33::2:52:1:1
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:2
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:3
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:4
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:5
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:6
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used
Group Address : ff33::2:52:1:7
Last Reporter : fe80::5869
  Uptime : 03:30:49
  Expires : not used

```

## IPv6 Multicast Listener Discovery Snooping over BVI

Multicast Listener Discovery (MLD) snooping provides a way to constrain multicast traffic at L2. By snooping the MLD membership reports sent by hosts in the bridge domain, the MLD snooping application can set up L2 multicast forwarding tables. This table is later used to deliver traffic only to ports with at least one interested member, significantly reducing the volume of multicast traffic.

MLDv2 support over BVI enables implementing IPv6 multicast routing over a L2 segment of the network that is using an IPv6 VLAN. The multicast routes are bridged via BVI interface from L3 segment to L2 segment of the network.

MLDv2 snooping over BVI enables forwarding MLDv2 membership reports received over the L2 domain to MLD snooping instead of MLD.

### Restrictions

- You cannot configure `t1-check` and disable `router-alert-check` on the router for mld messages.

- Static mrouter are not supported for MLD snooping.
- Querier is supported for MLDV2, but it is not supported on MLDV1.

## Configuring Internal Querier for MLD Snooping

This configuration enables a multicast router acting as a MLD querier to send out group-and-source-specific query:

```
router# config
RP/0/RP0/CPU0:router(config)# mld snooping profile grp1
RP/0/RP0/CPU0:router(config-mld-snooping-profile)# system-ip-address fe80::1 link-local
RP/0/RP0/CPU0:router(config-mld-snooping-profile)# internal-querier
RP/0/RP0/CPU0:router(config-mld-snooping-profile)# commit
```

### Verification

Use the **show mld snooping profile detail** command to verify the MLD snooping configuration:

```
router# show mld snooping profile detail
Thu Nov 22 13:58:18.844 UTC
MLD Snoop Profile grp1:
  System IP Address:          fe80::1
  Bridge Domain References:   2
  Port References:           12

MLD Snoop Profile grp10:
  System IP Address:          fe80::5610
  Bridge Domain References:   0
  Port References:           0
```

## Creating a MLD Snooping Profile

### Configuration

```
/* Enter the global configuration mode */
RP/0/RP0/CPU0:router # configure
/* Enters MLD snooping profile configuration mode and creates a named profile. */
RP/0/RP0/CPU0:router(config)# mld snooping profile default-bd-profile
RP/0/RP0/CPU0:router # commit
```

The default profile enables MLD snooping. You can commit the new profile without any additional configurations, or you can include additional configuration options to the profile. You can also return to the profile later to add configurations, as described in other tasks in this module.

If you are creating a bridge domain profile, consider the following:

- An empty profile is appropriate for attaching to a bridge domain. An empty profile enables MLD snooping with default configuration values.
- You can optionally add more commands to the profile to override default configuration values.
- If you include port-specific configurations in a bridge domain profile, the configurations apply to all ports under the bridge, unless another profile is attached to a port.



If you are creating a port-specific profile, consider the following:

- While an empty profile could be attached to a port, it would have no effect on the port configuration.
- When you attach a profile to a port, MLD snooping reconfigures that port, overriding any inheritance of configuration values from the bridge-domain profile. You must repeat the commands in the port profile if you want to retain those configurations.

You can detach a profile, change it, and reattach it to add commands to a profile at a later time.

### Running Configuration

```
RP/0/RP0/CPU0:router(config)# show running-config
configure
    mld snooping profile default-bd-profile
!
```

### Verification

Verify that the MLD snooping profile is created:

```
RP/0/RP0/CPU0:router#show mld snooping profile
```

Profile	Bridge Domain	Port
-----	-----	----
<b>default-bd-profile</b>	0	0
grp1	1	2
grp10	1	2

## Deactivating MLD Snooping on a Bridge Domain

To deactivate MLD snooping from a bridge domain, remove the profile from the bridge domain:



**Note** A bridge domain can have only one profile attached to it at a time.

### Configuration

```
/* Enter the global configuration mode followed by the bridge group and the bridge domain
mode */
RP0/0/RP0/CPU0:router# configuration
RP0/0/RP0/CPU0:router(config)# l2vpn
RP0/0/RP0/CPU0:router(config-l2vpn)# bridge group GRP1
RP0/0/RP0/CPU0:router(config-l2vpn-bg)# bridge domain ISP1

/* Detache the MLD snooping profile from the bridge domain. This disables MLD snooping on
that bridge domain */
/* Note: Only one profile can be attached to a bridge domain at a time. If a profile is
attached, MLD snooping is enabled.
If a profile is not attached, MLD snooping is disabled. */
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# no mld snooping profile
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# commit
```

**Running Configuration**

```
RP0/0/RP0/CPU0:router# show running-config
configuration
l2vpn
  bridge-group GRP1
  bridge-domain ISP1
  no mld snooping profile
!
```

## Configuring Static Mrouter Ports (MLD)

**Prerequisite**

MLD snooping must be enabled on the bridge domain for port-specific profiles to affect MLD snooping behavior.




---

**Note** Static mrouter port configuration is a port-level option and should be added to profiles intended for ports. It is not recommended to add mrouter port configuration to a profile intended for bridge domains.

---

**Configuration**

```
/* Enter the global configuration mode */
RP0/0/RP0/CPU0:router# configuration

/* Enter the MLD snooping profile configuration mode and create a new profile or accesses
an existing profile.*/
RP0/0/RP0/CPU0:router(config)# mld snooping profile mrouter-port-profile
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# mrouter
/* Configures a static mrouter on a port. */

RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# commit
```

**Running Configuration**

```
RP0/0/RP0/CPU0:router# show running-config
configuration
  mld snooping profile mrouter-port-profile
  mrouter
!
```

**Verification**

The below show command output confirms that the mrouter configuration is enabled:

```
RP0/0/RP0/CPU0:router# show mld snooping profile mrouter-port-profile

MLD Snoop Profile mrouter-port-profile:

  Static Mrouter:                Enabled
  Bridge Domain References:      0
  Port References:               0
```

# Configuring Router Guard (MLD)

To prevent multicast routing protocol messages from being received on a port and, therefore, prevent a port from being a dynamic mrouter port, follow these steps. Note that both router guard and static mrouter commands may be configured on the same port.

## Prerequisite

MLD snooping must be enabled on the bridge domain for port-specific profiles to affect MLD snooping behavior.



**Note** Router guard configuration is a port-level option and should be added to profiles intended for ports. It is not recommended to add router guard configuration to a profile intended for bridge domains. To do so would prevent all mrouter, including MLD queriers, from being discovered in the bridge domain.

## Configuration

```
/* Enter the global configuration mode and create the Bridge Group GRP1 and the Bridge
Domain ISP1*/
RP0/0/RP0/CPU0:router# configuration

/* Enter the MLD snooping profile configuration mode and create a new profile or accesses
an existing profile. */
RP0/0/RP0/CPU0:router(config)# mld snooping profile host-port-profile

/* Configure router guard. This protects the port from dynamic discovery.*/
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# router-guard
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# commit
```

## Running Configuration

```
RP0/0/RP0/CPU0:router# show running-config
configuration
  mld snooping profile host-port-profile
    router-guard
  !
```

## Verification

Verify that the router guard config in the named profile is enabled:

```
RP0/0/RP0/CPU0:router# show mld snooping profile host-port-profile detail
MLD Snoop Profile host-port-profile:
```

<b>Router Guard:</b>	<b>Enabled</b>
Bridge Domain References:	0
Port References:	0

## Configuring Immediate-leave for MLD

To add the MLD snooping immediate-leave option to an MLD snooping profile:

### Configuration

```
/* Enter the global configuration mode. */
RP0/0/RP0/CPU0:router# configuration

/* Enter MLD snooping profile configuration mode and create a new profile or accesses an
existing profile. */
RP0/0/RP0/CPU0:router(config)# mld snooping profile host-port-profile
/* Enable the immediate-leave option */
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# immediate-leave
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# commit
```

If you add the **immediate-leave** option:

- to a profile attached to a bridge domain, it applies to all ports under the bridge.
- to a profile attached to a port, it applies to the port.

### Running Configuration

```
RP0/0/RP0/CPU0:router# show running-config
configuration
 mld snooping profile host-port-profile
  immediate-leave
!
```

### Verification

Verify that the immediate leave config in the named profile is enabled:

```
RP0/0/RP0/CPU0:router# show mld snooping profile host-port-profile detail

MLD Snoop Profile host-port-profile:

  Immediate Leave:                Enabled
  Router Guard:                   Enabled

  Bridge Domain References:       0
  Port References:                 0
```

## Configuring Internal Querier for MLD

### Prerequisite

MLD snooping must be enabled on the bridge domain for this procedure to take effect.

### Configuration

```
/* Enter the global configuration mode. */
RP0/0/RP0/CPU0:router# configuration
```

```

/* Enter MLD snooping profile configuration mode and create a new profile or accesses an
existing profile. */
RP0/0/RP0/CPU0:router(config)# mld snooping profile internal-querier-profile

/* Configure an IP address for internal querier use. The default system-ip-address value
(0.0.0.0) is not valid for the internal querier.
You must explicitly configure an IP address. Enter a valid link-local IPv6 address. */
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# system-ip-address fe80::98 link-local

/* Enable an internal querier with default values for all options.*/
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# internal-querier
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# commit

```

### Running Configuration

```

RP0/0/RP0/CPU0:router# show running-config
configuration
 mld snooping profile internal-querier-profile
 system-ip-address fe80::98 link-local
 internal-querier
!

```



**Note** Internal Querier is not recommended, when BVI and MLD snooping is configured under a bridge.

### Verification

Verify that the internal querier config is enabled:

```

RP0/0/RP0/CPU0:router# show mld snooping profile internal-querier-profile detail

MLD Snoop Profile internal-querier-profile:

System IP Address:                fe80::98

Internal Querier Support:         Enabled

Bridge Domain References:         0
Port References:                  0

```

## Configuring Static Groups for MLD

To add one or more static groups or MLDv2 source groups to an MLD snooping profile, follow these steps:

### Prerequisite

MLD snooping must be enabled on the bridge domain for port-specific profiles to affect MLD snooping behavior.

### Configuration

```

/* Enter the global configuration mode. */
RP0/0/RP0/CPU0:router# configuration

/* Enter MLD snooping profile configuration mode and create a new profile or accesses an
existing profile. */

```

```
RP0/0/RP0/CPU0:router(config)# mld snooping profile host-port-profile

/* Configure a static group. */
/* Note: Repeat this step to add additional static groups. */
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# static group fe80::99 source fe80::99
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# commit
```

If you add the **static group** option:

- to a profile attached to a bridge domain, it applies to all ports under the bridge.
- to a profile attached to a port, it applies to the port.

## Running Configuration

```
RP0/0/RP0/CPU0:router# show running-config
configuration
 mld snooping profile host-port-profile
 static group fe80::99 source fe80::99
!
```

## Verification

```
RP0/0/RP0/CPU0:router# show mld snooping bridge-domain f1:100 detail
```

Bridge Domain #SGs	Profile	Act	Ver	#Ports	#Mrtrs	#Grps
f1:100	grp1	Y	v2	3	1	1000 1002

### Profile Configured Attributes:

```
System IP Address:          fe80::99
Minimum Version:            1
Report Suppression:         Enabled
Unsolicited Report Interval: 1000 (milliseconds)
TCN Query Solicit:          Disabled
TCN Membership Sync:        Disabled
TCN Flood:                  Enabled
TCN Flood Query Count:      2
Router Alert Check:         Disabled
TTL Check:                  Enabled
nV Mcast Offload:           Disabled
Internal Querier Support:   Disabled
Querier Query Interval:     125 (seconds)
Querier LMQ Interval:       1000 (milliseconds)
Querier LMQ Count:          2
Querier Robustness:         2
Startup Query Interval:     31 seconds
Startup Query Count:        2
Startup Query Max Response Time: 10.0 seconds
Mrouter Forwarding:         Enabled
P2MP Capability:            Disabled
Default IGMP Snooping profile: Disabled
IP Address:                  fe80::f278:16ff:fe63:4d81
Port:                        BVI1000
Version:                     v2
Query Interval:             125 seconds
Robustness:                  2
Max Resp Time:              10.0 seconds
Time since last G-Query:    97 seconds
```

```

Mrouter Ports:          1
  Dynamic:              BVI1000
STP Forwarding Ports:  0
ICCP Group Ports:      0
Groups:                 1000
  Member Ports:         0
V2 Source Groups:      1002
  Static/Include/Exclude: 0/1002/0
  Member Ports (Include/Exclude): 1002/0

```

## Configuring MLD Snooping

### Configure

```

RP0/0/RP0/CPU0:router# configure
/* Create two profiles. */
RP0/0/RP0/CPU0:router(config)# mld snooping profile bridge_profile
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# mld snooping profile port_profile
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# mrouter
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# exit
RP0/0/RP0/CPU0:router(config)#

/* Configure two physical interfaces for L2 support.*/
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/8/0/38
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# l2transport
RP0/0/RP0/CPU0:router(config-if)# no shut
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# interface GigabitEthernet0/8/0/39
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# l2transport
RP0/0/RP0/CPU0:router(config-if)# no shut
RP0/0/RP0/CPU0:router(config-if)# exit

/* Add interfaces to the bridge domain. Attach bridge_profile to the bridge domain and
port_profile to one of the Ethernet interfaces.
The second Ethernet interface inherits MLD snooping configuration attributes from the bridge
domain profile.*/
RP0/0/RP0/CPU0:router(config)# l2vpn
RP0/0/RP0/CPU0:router(config-l2vpn)# bridge group bg1
RP0/0/RP0/CPU0:router(config-l2vpn-bg)# bridge-domain bd1
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# mld snooping profile bridge_profile
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd-mld-snooping)# interface GigabitEthernet0/8/0/38
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd-mld-snooping-if)# mld snooping profile port_profile
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd-mld-snooping-if)# interface GigabitEthernet0/8/0/39
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd-mld-snooping-if)# exit
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd-mld-snooping)# exit
RP0/0/RP0/CPU0:router(config-l2vpn-bg-bd)# commit

```

### Running Configuration

```

RP0/0/RP0/CPU0:router# show running-config
configuration
  mld snooping profile bridge_profile
  !
mld snooping profile port_profile
  mrouter
  !

```

```

interface GigabitEthernet0/8/0/38
 negotiation auto
 l2transport
 no shut
 !
!
interface GigabitEthernet0/8/0/39
 negotiation auto
 l2transport
 no shut
 !
!
l2vpn
 bridge group bg1
 bridge-domain bd1
 mld snooping profile bridge_profile
 interface GigabitEthernet0/8/0/38
 mld snooping profile port_profile
 interface GigabitEthernet0/8/0/39
 !
!
!

```

### Verification

Verify the configured bridge ports.

```
RP0/0/RP0/CPU0:router# show mld snooping port
```

```

                                Bridge Domain f10:109

Port                               State
-----
BVI1009                             Oper STP Red #Grps #SGs
GigabitEthernet0/8/0/38             Up    -   -   1000 1000
GigabitEthernet0/8/0/39             Up    -   -   1000 1000

```

## Configuring MLD Snooping on Ethernet Bundles

This example assumes that the front-ends of the bundles are preconfigured. For example, a bundle configuration might consist of three switch interfaces, as follows:

### Configure

```

/* Configure the front-ends of the bundles consisting of three switch interfaces.*/
RP0/0/RP0/CPU0:router# configure
RP0/0/RP0/CPU0:router(config)# interface bundle-ether 1
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/0
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/1
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/2
RP0/0/RP0/CPU0:router(config-if)# channel-group 1 mode on
RP0/0/RP0/CPU0:router(config-if)# exit

```



```

RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/3
RP0/0/RP0/CPU0:router(config-if)# channel-group 1 mode on
RP0/0/RP0/CPU0:router(config-if)# exit

/* Configure two MLD snooping profiles. */
RP0/0/RP0/CPU0:router(config)# mld snooping profile bridge_profile
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# exit !
RP0/0/RP0/CPU0:router(config)# mld snooping profile port_profile
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# mrouter
RP0/0/RP0/CPU0:router(config-mld-snooping-profile)# exit

/* Configure interfaces as bundle member links. */

RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/0
RP0/0/RP0/CPU0:router(config-if)# bundle id 1 mode on
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/1
RP0/0/RP0/CPU0:router(config-if)# bundle id 1 mode on
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/2
RP0/0/RP0/CPU0:router(config-if)# bundle id 2 mode on
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface GigabitEthernet0/0/0/3
RP0/0/RP0/CPU0:router(config-if)# bundle id 2 mode on
RP0/0/RP0/CPU0:router(config-if)# negotiation auto
RP0/0/RP0/CPU0:router(config-if)# exit

/* Configure the bundle interfaces for L2 transport. */
RP0/0/RP0/CPU0:router(config)# interface Bundle-Ether 1
RP0/0/RP0/CPU0:router(config-if)# l2transport
RP0/0/RP0/CPU0:router(config-if)# exit
RP0/0/RP0/CPU0:router(config)# interface Bundle-Ether 2
RP0/0/RP0/CPU0:router(config-if)# l2transport
RP0/0/RP0/CPU0:router(config-if)# exit

/* Add the interfaces to the bridge domain and attach MLD snooping profiles. */
RP0/0/RP0/CPU0:router(config)# l2vpn
RP0/0/RP0/CPU0:router(config-l2vpn)# bridge group bg1
RP0/0/RP0/CPU0:router(config-l2vpn-bg)# mld snooping profile bridge_profile
RP0/0/RP0/CPU0:router(config-l2vpn-bg-mld-snooping-profile)# interface bundle-Ether 1
RP0/0/RP0/CPU0:router(config-l2vpn-bg-mld-snooping-profile-if)# mld snooping profile
port_profile
RP0/0/RP0/CPU0:router(config-l2vpn-bg-mld-snooping-profile-if)# interface bundle-Ether 2
RP0/0/RP0/CPU0:router(config-l2vpn-bg-mld-snooping-profile-if)# commit

```

### Running Configuration

```

RP0/0/RP0/CPU0:router# show running-config
configuration
  interface Port-channell
  !
  interface GigabitEthernet0/0/0/0
  !
  interface GigabitEthernet0/0/0/1
  !
    interface GigabitEthernet0/0/0/2
      channel-group 1 mode on
    !
  interface GigabitEthernet0/0/0/3

```

```

        channel-group 1 mode on
    !
mld snooping profile bridge_profile
    !
    mld snooping profile port_profile
        mrouter
    !
interface GigabitEthernet0/0/0/0
    bundle id 1 mode on
    negotiation auto
    !
interface GigabitEthernet0/0/0/1
    bundle id 1 mode on
    negotiation auto
    !
interface GigabitEthernet0/0/0/2
    bundle id 2 mode on
    negotiation auto
    !
interface GigabitEthernet0/0/0/3
    bundle id 2 mode on
    negotiation auto
    !
interface Bundle-Ether 1
    l2transport
    !
    !
interface Bundle-Ether 2
    l2transport
    !
    !
!

l2vpn
    bridge group bgl
        bridge-domain bd1
        mld snooping profile bridge_profile
        interface bundle-Ether 1
            mld snooping profile port_profile
        interface bundle-Ether 2
    !
    !
!

```

## Verification

```

RP0/0/RP0/CPU0:router# show mld snooping port
Bridge Domain BG1:BD1
State
Port Oper STP Red #Grps #SGs
----
HundredGigE0/0/0/3 Up - - 1 1
HundredGigE0/0/0/7 Up - - 1 1
HundredGigE0/19/0/11 Up - - 1 1
HundredGigE0/19/0/5 Up - - 1 1
RP/0/RP1/CPU0:Router#

```