



# IGMP Snooping

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This module describes how to enable and configure the Ethernet Virtual Connection (EVC)-based IP Multicast Internet Group Management Protocol (IGMP) Snooping feature both globally and on bridge domains.

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## Prerequisites for IGMP Snooping

- Basic IGMP v3 snooping support (BISS) is supported.
- POP operation for all vlan tags should be configured on EFP.
- Bridge domain (BD) interfaces from 1 to 4094 support IGMP snooping.
- Maximum number of EFPs supported on a single BD with IGMP snooping enabled:
  - RSP1 is 48
  - RSP2 is 128
- EFPs are supported only on different ports of a single BD, but not on the same ports on the RSP3 module.
- Maximum number of multicast routes for Layer 2 is 1000.
- Maximum number of multicast routes for Layer 3 (including control entries) for RSP1A, RSP1B, and RSP2 modules is 1000.
- Maximum number of multicast routes for Layer 2 and Layer 3 for the RSP3 module is 1000.



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- Note** We recommend a delay of at least 2 minutes while performing the below actions:
- Removal and addition of EFP configuration operation.
  - Removal and addition of bridge-domain interface (BDI) configuration operation.
  - Changing the interface configuration to default and reconfiguring the EFP again.
  - Removing and adding IGMP snooping to a bridge-domain.
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## Restrictions for IGMP Snooping

- Disable IGMP snooping for bi-directional traffic sent to the same group in the SSM.
- Layer2 multicast is not supported with IGMP snooping when static joins are configured in EFP or TEFP. However, Layer2 multicast with IGMP snooping is supported for dynamic joins configured on the EFP or TEFP.
- IGMP snooping is *not* supported with bridge domain interfaces greater than 4094.
- IGMP snooping must be turned off on the bridge domain when VPLS is configured, for IGMP reports to be sent over the VPLS pseudowire.
- Stateful switchover (SSO) is *not* supported for IGMP snooping.
- Static mrouter configuration is *not* supported.
- IGMP snooping for Trunk EFPs, port channels interfaces and pseudowires is *not* supported on the RSP1 module.
- IGMP snooping for EFPs and Trunk EPFs is supported on the RSP3 module.
- Starting with Cisco IOS Release 3.13, for Protocol Independent Multicast (PIM) Source Specific Multicast (SSM), with Bridge Domain Interface (BDI) as Incoming Interface (IIF), IGMP Snooping is *not* supported on the corresponding Bridge Domain (BD).



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- Note** To overcome this restriction, enable the command **platform multicast bridge-tcam-handling disable** and reload the router.
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This restriction does not apply to Cisco RSP3 module.

- Starting with Cisco IOS Release 3.13, for Protocol Independent Multicast Sparse Mode (PIM-SM), with Bridge Domain Interface BDI as Incoming Interface (IIF), IGMP Snooping is *not* supported on the corresponding Bridge Domain (BD) in non-Designated Router (DR) node.



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- Note** To overcome this restriction, enable the command **platform multicast bridge-tcam-handling disable** and reload the router.
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This restriction does not apply to Cisco RSP3 module.

Starting with Cisco IOS Release 3.14, IGMP snooping is supported on the TEFPs on the RSP2 modules. IGMP snooping on RSP2 is *not* supported for port channels and pseudowires.

## Information About IGMP Snooping

### IGMP Snooping

IP Multicast Internet Group Management Protocol (IGMP), which runs at Layer 3 on a multicast device, generates Layer 3 IGMP queries in subnets where the multicast traffic must be routed. IGMP (on a device) sends out periodic general IGMP queries.

IGMP Snooping is an Ethernet Virtual Circuit (EVC)-based feature set. EVC decouples the concept of VLAN and broadcast domain. An EVC is an end-to-end representation of a single instance of a Layer 2 service being offered by a provider. In the Cisco EVC framework, bridge domains are made up of one or more Layer 2 interfaces known as service instances. A service instance is the instantiation of an EVC on a given port on a given device. A service instance is associated with a bridge domain based on the configuration.

When you enable EVC-based IGMP snooping on a bridge domain, the bridge domain interface responds at Layer 2 to the IGMP queries with only one IGMP join request per Layer 2 multicast group. Each bridge domain represents a Layer 2 broadcast domain. The bridge domain interface creates one entry per subnet in the Layer 2 forwarding table for each Layer 2 multicast group from which it receives an IGMP join request. All hosts interested in this multicast traffic send IGMP join requests and are added to the forwarding table entry. During a Layer 2 lookup on a bridge domain to which the bridge domain interface belongs, the bridge domain forwards the packets to the correct EFP. When the bridge domain interface hears the IGMP Leave group message from a host, it removes the table entry of the host.

IGMP snooping is supported on Metro IP and Metro Aggregate licenses on the router. IGMP snooping is supported with REP and G.8032.




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**Note** IGMP snooping is *not* supported with REP and G.8032 on the RSP3 module.

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## How to Configure IGMP Snooping

### Enabling IGMP Snooping

#### Procedure

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# <code>configure terminal</code>	Enters global configuration mode.
<b>Step 3</b>	<b>ip igmp snooping</b> <b>Example:</b> Device(config)# <code>ip igmp snooping</code>	Globally enables IGMP snooping after it has been disabled.
<b>Step 4</b>	<b>bridge-domain <i>bridge-id</i></b> <b>Example:</b> Device(config)# <code>bridge-domain 100</code>	(Optional) Enters bridge domain configuration mode.
<b>Step 5</b>	<b>ip igmp snooping</b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping</code>	(Optional) Enables IGMP snooping on the bridge domain interface being configured. <ul style="list-style-type: none"> <li>• Required only if IGMP snooping was previously explicitly disabled on the specified bridge domain.</li> </ul>
<b>Step 6</b>	<b>end</b> <b>Example:</b> Device(config-bdomain)# <code>end</code>	Returns to privileged EXEC mode.

## Configuring IGMP Snooping Globally

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# <code>configure terminal</code>	Enters global configuration mode.
<b>Step 3</b>	<b>ip igmp snooping robustness-variable <i>variable</i></b> <b>Example:</b>	Configures the IGMP defined robustness variable .

	Command or Action	Purpose
	Device(config)# <b>ip igmp snooping robustness-variable 3</b>	
<b>Step 4</b>	<b>ip igmp snooping report-suppression</b> <b>Example:</b> Device(config)# <b>ip igmp snooping report-suppression</b>	Enables report suppression for IGMP snooping.
<b>Step 5</b>	<b>ip igmp snooping last-member-query-count</b> <i>count</i> <b>Example:</b> Device(config)# <b>ip igmp snooping last-member-query-count 5</b>	Configures how often IGMP snooping sends query messages in response to receiving an IGMP leave message. The default is 2.
<b>Step 6</b>	<b>ip igmp snooping last-member-query-interval</b> <i>interval</i> <b>Example:</b> Device(config)# <b>ip igmp snooping last-member-query-interval 200</b>	Configures the length of time after which the group record is deleted if no reports are received. The default is 1000 milliseconds.
<b>Step 7</b>	<b>ip igmp snooping check ttl</b> <b>Example:</b> Device(config)# <b>ip igmp snooping check ttl</b>	Enforces IGMP snooping check.
<b>Step 8</b>	<b>exit</b> <b>Example:</b> Device(config)# <b>exit</b>	Exits global configuration mode and returns to privileged EXEC mode.

## Configuring IGMP Snooping on a Bridge Domain

### Before you begin

- The bridge domain must be created.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> <b>enable</b>	Enables privileged EXEC mode.  • Enter your password if prompted.

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# <code>configure terminal</code>	Enters global configuration mode.
<b>Step 3</b>	<b>bridge-domain <i>bridge-id</i></b> <b>Example:</b> Device(config)# <code>bridge-domain 100</code>	Enters bridge domain configuration mode.
<b>Step 4</b>	<b>ip igmp snooping immediate-leave</b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping immediate-leave</code>	Enables IGMPv2 immediate-leave processing. <b>Note</b> When both immediate-leave processing and the query count are configured, fast-leave processing takes precedence.
<b>Step 5</b>	<b>ip igmp snooping last-member-query-count <i>count</i></b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping last-member-query-count 5</code>	Sets the count for last member query messages sent in response to receiving an IGMP leave message. The valid range is 1 to 7. The default is 2 milliseconds. <b>Note</b> When both immediate-leave processing and the query count are configured, fast-leave processing takes precedence.
<b>Step 6</b>	<b>ip igmp snooping last-member-query-interval <i>interval</i></b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping last-member-query-interval 2000</code>	Sets the last member query interval of the bridge domain. The valid range is from 100 to 32767. The default is 1000 milliseconds.
<b>Step 7</b>	<b>ip igmp snooping robustness-variable <i>variable</i></b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping robustness-variable 3</code>	Configures the IGMP snooping robustness variable. The default is 2.
<b>Step 8</b>	<b>ip igmp snooping report-suppression</b> <b>Example:</b> Device(config-bdomain)# <code>ip igmp snooping report-suppression</code>	Enables report suppression for all hosts on the bridge domain.

	Command or Action	Purpose
<b>Step 9</b>	<b>ip igmp snooping check ttl</b> <b>Example:</b> Device(config-bdomain)# <b>ip igmp snooping check ttl</b>	Enforces IGMP snooping check.
<b>Step 10</b>	<b>end</b> <b>Example:</b> Device(config-bdomain)# <b>end</b>	Returns to privileged EXEC mode.

## Disabling IGMP Snooping Globally

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> <b>enable</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 3</b>	<b>no ip igmp snooping</b> <b>Example:</b> Device(config)# <b>no ip igmp snooping</b>	Disables IGMP snooping on the router.
<b>Step 4</b>	<b>exit</b> <b>Example:</b> Device(config)# <b>exit</b>	Exits global configuration mode and returns to privileged EXEC mode.

## Disabling IGMP Snooping on a Bridge Domain

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> <b>enable</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b>	Enters global configuration mode.

	Command or Action	Purpose
	Device# <b>configure terminal</b>	
<b>Step 3</b>	<b>bridge-domain</b> <i>bridge-id</i>  <b>Example:</b> Device(config)# <b>bridge-domain</b> 4000	Enters bridge domain configuration mode.
<b>Step 4</b>	<b>no ip igmp snooping</b>  <b>Example:</b> Device(config-bdomain)# <b>no ip igmp snooping</b>	Disables IGMP snooping on the bridge domain.
<b>Step 5</b>	<b>end</b>  <b>Example:</b> Device(config-bdomain)# <b>end</b>	Returns to privileged EXEC mode.

## Verifying IGMP Snooping

Use these commands to verify IGMP Snooping on the router.

- **show ip igmp snooping**

This command displays the IGMP snooping configuration globally on the router. The following is a sample output from the command:

```
Router# show ip igmp snooping

Global IGMP Snooping configuration:
-----
IGMP snooping Oper State      : Enabled
IGMPv3 snooping (minimal)    : Enabled
Report suppression           : Enabled
TCN solicit query            : Enabled
Robustness variable          : 3
Last member query count      : 2
Last member query interval    : 200
Check TTL=1                  : Yes
Check Router-Alert-Option    : No

Vlan 1:
-----
IGMP snooping Admin State     : Enabled
IGMP snooping Oper State     : Enabled
IGMPv2 immediate leave       : Disabled
Report suppression           : Enabled
Robustness variable          : 3
Last member query count      : 2
Last member query interval    : 200
Check TTL=1                  : Yes
Check Router-Alert-Option    : Yes
.
.
.
```

- **show ip igmp snooping [bd *bd-id*]**



This command displays configuration for IGMP snooping by bridge domain. The following is a sample output from the command:

```
Router# show ip igmp snooping bd 100

Global IGMP Snooping configuration:
-----
IGMP snooping Oper State      : Enabled
IGMPv3 snooping (minimal)    : Enabled
Report suppression           : Enabled
TCN solicit query            : Enabled
Robustness variable          : 3
Last member query count      : 2
Last member query interval   : 200
Check TTL=1                  : Yes
Check Router-Alert-Option    : No

Vlan 100:
-----
IGMP snooping Admin State     : Enabled
IGMP snooping Oper State     : Enabled
IGMPv2 immediate leave       : Disabled
Report suppression           : Enabled
Robustness variable          : 3
Last member query count      : 2
Last member query interval   : 200
Check TTL=1                  : Yes
Check Router-Alert-Option    : Yes
Query Interval                : 0
Max Response Time            : 10000
```

- **show ip igmp snooping groups bd *bd-id* count**

This command displays snooping information for groups by bridge domain. This is a sample output from the command:

```
Router# show ip igmp snooping group bd 4000 count

Total number of groups in Vlan 4000:  2
Total number of (S,G) in Vlan 4000:  0
```

- **show ip igmp snooping groups count**

This command displays snooping information for groups. This is a sample output from the command:

```
Router# show ip igmp snooping groups count

Total number of groups:  4
Total number of (S,G):  0
```

- **show ip igmp snooping counters [bd *bd-id*]**

This command displays IGMP snooping counters, globally or by bridge domain. This is the sample output from this command where Ovr and Und represent oversize and undersize respectively:

```
Router# show ip igmp snooping counters

Counters of group "IGMP snooping counters" overall there
are 15 counters
Type                                     | Value | Ovr | Und
-----+-----+-----+-----
RX processed Query Count                 | 0     |    |    
```

```

RX processed Group Specific Query      | 0      |      |
RX processed Join                      | 0      |      |
RX processed Leave                     | 0      |      |
RX processed Total Valid Packets       | 0      |      |
RX processed Other Packets             | 0      |      |
RX Packets dropped for sanity errors   | 0      |      |
RX Packets dropped for checksum errors  | 0      |      |
RX Packets dropped for header length errors | 0      |      |
RX Packets dropped for other errors    | 0      |      |
RX processed Topology change notification | 0      |      |
TX processed Query Count               | 0      |      |
TX processed Group Specific Query      | 0      |      |
TX processed Join                      | 0      |      |
TX processed Leave                     | 0      |      |

Counters of group "IGMP snooping V3 counters" overall there
are 18 counters
RX processed V3 ALLOW NEW               | 0      |      |
RX processed V3 BLOCK OLD              | 0      |      |

Type                                     | Value  | Ovr | Und
-----+-----+-----+-----
RX processed V3 MODE IS INCLUDE         | 0      |    |
RX processed V3 MODE IS EXCLUDE        | 0      |    |
RX processed V3 CHANGE TO INCLUDE      | 0      |    |
RX processed V3 CHANGE TO EXCLUDE     | 0      |    |
RX processed V3 Query                  | 0      |    |
RX processed V3 Group Specific Query   | 0      |    |
RX processed V3 GSS Query              | 0      |    |
TX processed V3 ALLOW NEW               | 0      |    |
TX processed V3 BLOCK OLD              | 0      |    |
TX processed V3 MODE IS INCLUDE        | 0      |    |
TX processed V3 MODE IS EXCLUDE        | 0      |    |
TX processed V3 CHANGE TO INCLUDE      | 0      |    |
TX processed V3 CHANGE TO EXCLUDE     | 0      |    |
TX processed V3 Query                  | 0      |    |
TX processed V3 Group Specific Query   | 0      |    |
TX processed V3 GSS Query              | 0      |    |

```

- **show ip igmp snooping mrouter**

**[bd *bd-id*]**

This command displays multicast ports, globally or by bridge domain.. This is a sample output from the command:

```
Router# show ip igmp snooping mrouter
```

```

Vlan    ports
----    -
100     Gi0/3/4-efp1 (dynamic)
  10     Gi0/4/5-tefp1 (dynamic)
100     Po64-efp100 (dynamic)

```

- **show ip igmp snooping querier**

**[bd *bd-id*]**

This command displays the IGMP querier information globally or by a bridge domain. This is a sample output from the command:

```
Router# show ip igmp snooping querier
```

```

Vlan      IP Address                IGMP Version  Port
-----

```

```

100      10.0.0.2          v2      Gi0/3/4-efp1
10       10.0.0.2          v2      Gi0/4/5-tefp1
100     30.1.1.12       v2      Po64-efp100

```

- **show ip igmp snooping group**

This command displays the IGMP snooping information about multicast groups by VLAN. This is a sample output from the command:

```
Router# show ip igmp snooping group
```

```

Flags: I -- IGMP snooping, S -- Static, P -- PIM snooping, A -- ASM mode
Vlan   Group/source      Type      Version      Port List
-----
100    226.0.1.1         I         v2           Gi0/1/1-efp100
10     225.1.1.1         I         v2           Gi0/4/2-tefp1
100    235.1.1.3         I         v2           Po64-efp1

```

- **show ip igmp snooping group bd**

This command displays the BD level IGMP snooping information. This is a sample output from the command:

```
Router# show ip igmp snooping group bd 100 226.0.1.1
```

```

Flags: I -- IGMP snooping, S -- Static, P -- PIM snooping, A -- ASM mode
Vlan   Group/source      Type      Version      Port List
-----
100    226.0.1.1         I         v2           Gi0/1/1-efp100
100    235.1.1.3         I         v2           Po64-efp1

```

For Scale scenarios: Check the Snooping groups count per BD level.

```
Router# show ip igmp snooping group bd 100 count
```

```

Total number of groups in Vlan 100:  1
Total number of (S,G) in Vlan 100:  0

```

