Sun Ethernet Fabric Operating System

IGS Administration Guide

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Contents

Using This Documentation

This guide explains the configuration of the IGS protocol that runs as a part of SEFOS. You are expected to have a basic knowledge of the protocol as a prerequisite to using the instructions in this guide.

Product Notes

For late-breaking information and known issues about the following products, refer to the product notes at:

Sun Blade 6000 Ethernet Switched NEM 24p 10GbE:

http://www.oracle.com/pls/topic/lookup?ctx=SB6K-24p-10GbE

Sun Network 10GbE Switch 72p:

http://www.oracle.com/pls/topic/lookup?ctx=SN-10GbE-72p

Related Documentation

Documentation	Links
All Oracle products	http://oracle.com/documentation
Sun Blade 6000 Ethernet Switched NEM 24p 10GbE	http://www.oracle.com/pls/topic/lookup?ctx=SB6K-24p-10GbE
Sun Network 10GbE Switch 72p	http://www.oracle.com/pls/topic/lookup?ctx=SN-10GbE-72p
Sun Blade 6000 modular system	http://www.oracle.com/pls/topic/lookup?ctx=sb6000
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0	http://www.oracle.com/pls/topic/lookup?ctx=ilom30

For detailed information about the commands and options described in this document, refer to the *Sun Ethernet Fabric Operating System CLI Base Reference Manual*.

Acronyms and Abbreviations

Acronym or Abbreviation	Explanation
CLI	Command-line interface
GARP	Generic Attribute Registration Protocol
GMRP	GARP Multicast Registration Protocol
ID	Identifier
IGMP	Internet Group Management Protocol
IGS	IGMP snooping
Oracle ILOM	Oracle Integrated Lights Out Management
IP	Internet Protocol
MAC	Media address control

Acronym or Abbreviation	Explanation
MSTP	Multiple Spanning Tree Protocol
RSTP	Rapid Spanning Tree Protocol
SEFOS	Sun Ethernet Fabric Operating System
VLAN	Virtual local area network

CLI Command Modes

The following table lists the configuration modes used in this document with their access and exit methods.

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Access SEFOS from Oracle ILOM with read-only rights (privilege level 1).	`SEFOS>`	Use the `logout` or `exit` command to return to the Oracle ILOM prompt.
Privileged EXEC	Access SEFOS from Oracle ILOM with full administrative rights (privilege level 15).	`SEFOS#`	Use the `logout` or `exit` command to return to the Oracle ILOM prompt.
Global Configuration	From User EXEC mode, use the `enable` command.	`SEFOS(config)#`	Use the `end` command to return to Privileged EXEC mode.
Interface Configuration	From Global Configuration mode, use the `interface interface-type interface-id` command.	`SEFOS(config-if)#`	Use the `exit` command to return to Global Configuration mode, or use the `end` command to return to Privileged EXEC mode.

Feedback

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http://www.oracle.com/goto/docfeedback

Support and Accessibility

Description	Links
Access electronic support through My Oracle Support	http://support.oracle.com For hearing impaired: http://www.oracle.com/accessibility/support.html
Learn about Oracle's commitment to accessibility	http://www.oracle.com/us/corporate/accessibility/index.html

IGS Overview

These sections contain a description of the IGS protocol as it is implemented in SEFOS. These sections also contain a description of an example topology that is referenced in the configuration instructions and a description of the default settings for the IGS software.

IGS Protocol Description

IGS enables a switch to snoop or capture information from IGMP packets being sent back and forth between hosts and a router. Based on this information, the switch adds or deletes the multicast addresses from its address table, thereby enabling or disabling multicast traffic from flowing to individual host ports. In subnets where IGMP is configured, IGS manages multicast traffic at layer 2.

IGMP (on a router) periodically sends out IGMP general queries. When IGS is enabled, the switch responds to the IGMP queries with only one IGMP join request per multicast group. The switch 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. Hosts interested in the multicast traffic send IGMP join requests and are added to the forwarding table entry.

Layer 2 multicast groups learned through IGS are dynamic. However, it is possible to statically configure layer 2 multicast groups using the `ip igmp snooping static` command. If group membership for a multicast group address is specified statically, then the configured static setting supersedes any automatic manipulation by IGS. Multicast group membership lists consist of both user-defined settings and IGS.

Groups with IP addresses in the `224.0.0.0-255.0.0.0` range are reserved for routing control packets and are flooded to all the forwarding ports of the VLAN. These addresses map to the multicast MAC address range `0100.5E00.0001` to `0100.5E00.00FF`.

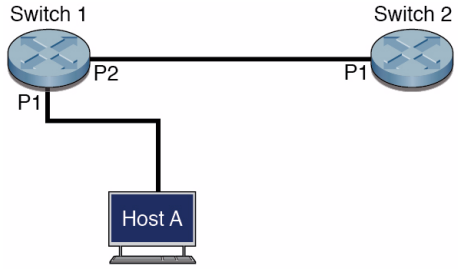
A host connected to a layer 2 interface that needs to join an IP multicast group, sends an IGMP join request specifying the IP multicast group. A host that needs to leave the multicast group can either ignore the periodic IGMP general queries or can send an IGMP leave message. When the switch receives an IGMP leave message from a host, the switch sends out an IGMP group-specific query to determine whether any device connected to that interface is interested in the traffic for the specific multicast group. The switch then updates the table entry for that layer 2 multicast group so that only those hosts interested in receiving multicast traffic for the group are listed.

When a host connected to the switch wants to join an IP multicast group, the host sends an unsolicited IGMP join message, specifying the IP multicast group to join. Alternatively, when the switch receives a general query from the router, the switch forwards the query to all ports in the VLAN. Hosts wanting to join the multicast group respond by sending a join message to the switch. The switch creates a multicast forwarding-table entry for the group if it is not already present.

The switch also adds the interface from which the join message was received to the forwarding table entry. After the forwarding table entry is created, the host associated with that interface receives multicast traffic for that multicast group.

Topology Example

The procedures in this guide are based on the example topology given in this section. The procedures contain CLI input and example output that use `0/1`, `0/2`, and `0/3` as the given interface numbers. Variables such as interfaces, IP addresses, and other ID numbers might be different based on your site configuration. This illustration shows the example topology on which the instructions are based.



Configuration Prerequisites

Before you can configure IGS, you must ensure that the following guidelines are met:

- GMRP is disabled.
- Fast leave is enabled on a port (the port must be connected to a host, not to a switch or hub).

Default Settings

This table contains the default settings for the IGS features. If the switch resets for any reason, it returns to the saved configuration. If you have not saved a site configuration, the switch returns to the default settings.

Feature	Setting
Group specific query interval	2 seconds
Group specific query retry count	2
IGS	Disabled
IGS learning method	MAC based
IGS version	V3
Multicast routers	Not configured
Port purge interval	260 seconds
Proxy reporting	Enabled
Report forward interval	5 seconds
Router port purge interval	125 seconds

Configuring IGS

These sections contain procedures that describe how to configure the IGS software in SEFOS. The procedures are based on "Topology Example" on page 6. The CLI input and example output contains port numbers and configuration settings that are specific to the example topology. The configuration input for your site might vary.

Enabling and Disabling IGS

This section contains procedures that explain how to enable IGS globally or on a per-port basis in a VLAN. Additionally, a procedure for disabling IGS on the switch is included.

■ "Disable IGS" on page 12

▼ Enable IGS Globally

By default, IGS is disabled globally. To enable IGS, GMRP must first be disabled.

1. Enter Global Configuration mode, and disable GMRP.

```
SEFOS# configure terminal
SEFOS(config)# set gmrp disable
```

2. Enable IGS globally.

```
SEFOS(config)# ip igmp snooping
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

4. Send an IGMP V2 report to group `227.2.2.2`, which is learned on the switch.

```
SEFOS# show ip igmp snooping forwarding-database
```

```
 Vlan  MAC-Address          Ports
 ----  -----------------    -----
    1  01:00:5e:02:02:02    Ex0/1
```

▼ Enable IGS on a Specific VLAN Interface

When IGS is enabled globally, it is enabled in all of the existing VLAN interfaces. When IGMP snooping is disabled globally, it is disabled in all of the existing VLAN interfaces.

1. Enter the configuration mode for the VLAN interface.

```
SEFOS# configure terminal
SEFOS(config)# vlan 2
```

2. Enable IGS on the interface.

```
SEFOS(config-vlan)# ip igmp snooping
SEFOS(config-vlan)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping vlan 2

Snooping VLAN Configuration for the VLAN 2
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

When IGS is enabled and disabled globally, but not enabled on `VLAN 2`, the `show` command produces:

```
Snooping VLAN Configuration for the VLAN 2
  IGMP Snooping is disabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
```

```
   Query interval is 125 seconds
   Port Purge Interval is 260 seconds
   Max Response Code is 100, Time is 10 seconds
```

▼ Disable IGS

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Disable IGS.

```
SEFOS(config)# no ip igmp snooping
```

▼ Configure Multicast Forwarding Mode

The snooping multicast forwarding mode can be IP-based or MAC-based. By default, multicast forwarding mode is MAC-based.

1. Configure the multicast forwarding mode (IP in this example).

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode ip
SEFOS(config)# end
```

2. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is IP based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
```

```
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Configure the IGS Version

You can configure the operating version of the IGS switch for a specific VLAN as v1, v2, or v3. By default, the operating version of the IGS switch for all of the VLANs is v3. Before you can configure IGS features, you must already configure your network environment, as described in "Topology Example" on page 6.

1. Enter the configure mode for the VLAN interface.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Configure the IGS version.

```
SEFOS(config-vlan)# ip igmp snooping version v2
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping vlan 4

Snooping VLAN Configuration for the VLAN 4
  IGMP Snooping enabled
  IGMP configured version is V2
  Fast leave is disabled
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
```

Configuring a Multicast Router Port

You can configure multicast router ports for a VLAN statically, or the port can be learned dynamically. Whenever a port receives a query message, then that port is also added to the multicast router port list. This section contains procedures that explain how to enable or disable multicast router ports. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Enable Multicast Router Port

1. Enter the configure mode for the VLAN.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Enable static configuration of multicast router ports.

```
SEFOS(config-vlan)# ip igmp snooping mrouter extreme-ethernet 0/8
SEFOS(config-vlan)# ip igmp snooping mrouter extreme-ethernet 0/9
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping mrouter

Vlan   Ports
-----  ------
1. Ex0/8(static), Ex0/9(static)
```

4. Send a query message on port 2, and review the configuration in switch A.

```
SEFOS# show ip igmp snooping mrouter

Vlan   Ports
-----  ------
    1  Ex0/1(dynamic)
Ex0/8(static), Ex0/9(static)
```

Router ports are learned on reception of PIM or OSPF messages from a router.

▼ Disable a Multicast Router Port

1. Enter the configure mode for the VLAN.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Disable the router port.

```
SEFOS(config-vlan)# no ip igmp snooping mrouter extreme-ethernet
0/8
SEFOS(config)# end
```

▼ Configure the Multicast Router Port Time-Out Value

Configuring the multicast router port time-out value sets the IGS router port-purge time-out value, after which the port gets deleted if no IGMP router control packets are received. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

1. Configure the multicast router port time-out value.

```
SEFOS# configure terminal
SEFOS(config)# ip igmp snooping mrouter-time-out 60
SEFOS(config)# end
```

Dynamically learned `mrouter` entries are deleted after 60 seconds.

2. **Review the configuration.**

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 60 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

Statically configured router ports are not deleted after the expiration of the router purge-time interval.

Configuring IGS Querier Settings

You can configure the IGS switch as a querier for a specific VLAN. You can also configure the group-specific query interval for that VLAN. The IGS switch stops acting as a querier on the reception of general queries. The switch resumes the querier function when there are no IGMP routers in the network. The IGS switch continues to act as a querier on the reception of router control messages (for instance, PIM or OSPF messages), and the switch acts as a querier when the router port is operationally down and there are no router ports in the switch. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

- "Enable IGS as a Querier" on page 17
- "Configure the IGMP Snooping Query Interval" on page 17

▼ Enable IGS as a Querier

By configuring the IGS switch as a querier, the switch starts sending general queries at regular time intervals. The querier message sent by the switch does not take part in querier election. If the switch receives a query from any other router, the switch stops acting as a querier.

1. Enter the configure mode for the VLAN.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Enable the switch as the IGS querier.

```
SEFOS(config-vlan)# ip igmp snooping querier
SEFOS(config-vlan)# end
SEFOS#
```

The switch sends general queries on the member ports of `VLAN 4` every 125 seconds.

3. Review the configuration.

```
SEFOS# show ip igmp snooping vlan 4

Snooping VLAN Configuration for the VLAN 4
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Querier
  Snooping switch is acting as Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

▼ Configure the IGMP Snooping Query Interval

The IGS query interval refers to the time interval during which the switch waits after sending a group-specific query to determine if hosts are still interested in a specific multicast group.

1. **Enter the configure mode for the VLAN.**

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. **Configure the query interval.**

```
SEFOS(config-vlan)# ip igmp snooping query-interval 60
SEFOS(config)# end
```

3. **Review the configuration.**

```
SEFOS# show ip igmp snooping

Snooping VLAN Configuration for the VLAN 4
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Querier
  Snooping switch is acting as Querier
  Query interval is 60 seconds
  Port Purge Interval is 130 seconds
  Max Response Code is 100, Time is 10 seconds
```

Configuring Proxy Reporting

Proxy reporting enables reports that are received from downstream hosts to be summarized. You can also use proxy reporting to build internal membership states. An IGMP proxy reporting switch reports its own state in response to upstream queriers. Proxy reporting reduces IGMP network traffic. By default, proxy reporting is enabled. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Disable Proxy Reporting

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Disable proxy reporting.

```
SEFOS(config)# no ip igmp snooping proxy-reporting
```

▼ Enable Proxy Reporting

1. Configure proxy reporting.

```
SEFOS# configure terminal
SEFOS(config)# ip igmp snooping proxy-reporting
SEFOS(config)# end
```

2. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

Configuring the Port-Purge Interval

The expiration of the port-purge timer on the port for a particular multicast group results in the port being removed from the forwarding list of the corresponding multicast entry in the multicast forwarding table. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Set the Port-Purge Interval

1. Enter the Global Configuration mode.

```
SEFOS# configure terminal
```

2. View the multicast forwarding table.

```
SEFOS# show ip igmp snooping forwarding-database

 Vlan  MAC-Address          Ports
 ----  -----------------    -----
    1  01:00:5e:01:01:01    Ex0/1
```

3. Set the port-purge interval.

```
SEFOS(config)# ip igmp snooping port-purge-interval 130
SEFOS(config)# end
```

If an entry is learned on the forwarding database, then after an interval of 130 seconds, the entry is removed from the forwarding database.

4. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
```

```
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 130 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Reset the Port-Purge Interval

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the port-purge interval to its default value.

```
SEFOS(config)# no ip igmp snooping port-purge-interval
```

Configuring Leave Processing

Configuring the fast leave processing removes the interface from the forwarding table as soon as the switch receives a leave message from the interface (that is, the switch refrains from sending MAC-based general queries over the interface). The VLAN interface is pruned from the multicast tree for the multicast group specified in the original leave message. Configuring the immediate-leave processing ensures optimal bandwidth management for all of the hosts on a switched network, even when multiple multicast groups are simultaneously in use. You can use the same instructions to enable or disable the leave process to immediate. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

- "Enable the Fast Leave Process" on page 22
- "Disable the Fast Leave Process" on page 22

▼ Enable the Fast Leave Process

1. Enter the configuration mode for the VLAN interface.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Enable the fast leave process.

```
SEFOS(config-vlan)# ip igmp snooping fast-leave
SEFOS(config-vlan)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping

Snooping VLAN Configuration for the VLAN 4
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is enabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

▼ Disable the Fast Leave Process

1. Enter the configuration mode for the VLAN interface.

```
SEFOS# configure terminal
```

2. Disable the fast leave process for the VLAN.

```
SEFOS(config-vlan)# no ip igmp snooping fast-leave
```

Configuring the Report Suppression Interval

Reports sent to router ports can be suppressed for a specific period of time. You can configure the suppression time interval for which the IGMPv2 report messages for the same group are not forwarded onto the router ports. By default, the report suppression interval is 5 seconds. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Enable the Report Suppression Interval

1. **Configure the report suppression interval.**

```
SEFOS# configure terminal
SEFOS(config)# ip igmp snooping report-suppression-interval 8
SEFOS(config)# end
```

Only one report is forwarded within the report forward interval of 8 seconds for a particular group.

2. **Review the configuration.**

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 8 seconds
Group specific query interval is 2 seconds
```

```
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Disable the Report Suppression Interval

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the report suppression interval time to its default value.

```
SEFOS(config)# no ip igmp snooping report-suppression-interval
```

Configuring the Group Query Interval Value

When a switch receives an IGMP leave message on a port, the switch sends the group-specific query message on that particular port. You can configure the time interval value after which the switch is supposed to send a group specific query on a port. You also can configure the maximum number of group specific queries sent on a port on reception of an IGMPv2 leave message. The default value of the group query interval value is 2 seconds. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

- "Set the Group Query Interval Value" on page 24
- "Reset the Group Query Interval" on page 25

▼ Set the Group Query Interval Value

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the group query interval.

```
SEFOS(config)# ip igmp snooping group-query-interval 3
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping globals
Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 3 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Reset the Group Query Interval

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the group query interval to its default value.

```
SEFOS(config)# no ip igmp snooping group-query-interval
```

Configuring the Group Retry Count Value

Configuring the group retry count sets the maximum number of group specific queries sent on a port on reception of an IGMPv2 leave message. The default value of group retry count is 2. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Set the Group Retry Count Value

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the group retry count.

```
SEFOS(config)# ip igmp snooping retry-count 4
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 3 seconds
```

```
Reports are forwarded on router ports
Group specific query retry count is 4
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Reset the Group Retry Count Value

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the group retry count to its default value.

```
SEFOS(config)# no ip igmp snooping retry-count
```

Configuring Report Forwarding

By default, an IGMP report message is forwarded on all of the router ports in a VLAN. However, you can configure the reports to be forwarded on the member ports of the VLAN. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

▼ Enable Report Forwarding

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Enable report forwarding on all ports.

```
SEFOS(config)# ip igmp snooping report-forward all-ports
SEFOS(config)# end
```

3. **Review the configuration.**

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on all ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Disable Report Forwarding

1. **Enter Global Configuration mode.**

```
SEFOS# configure terminal
```

2. **Disable the forwarding of reports only to the router ports.**

```
SEFOS(config)# ip igmp snooping report-forward router-ports
SEFOS(config)# end
```

3. **Review the configuration.**

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
```

```
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

▼ Reset Report Forwarding to the Default Value

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Set the report forwarding status to its default value.

```
SEFOS(config)# no ip igmp snooping report-forward
SEFOS(config)# end
```

Clearing the Snooping Statistics

The snooping statistics are updated for each VLAN whenever the various multicast packets are transmitted or received. The statistics are cleared per VLAN or for all VLANs based on the configuration. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

- "Clear the Statistics for a Specific VLAN" on page 30
- "Clear the Statistics for All VLANs" on page 31

▼ Clear the Statistics for a Specific VLAN

1. Enter the configuration mode for the VLAN.

```
SEFOS# configure terminal
SEFOS(config)# vlan 4
```

2. Enable IGS in the VLAN.

```
SEFOS(config-vlan)# ip igmp snooping
SEFOS(config-vlan)# end
```

3. Review the statistics.

```
SEFOS# show ip igmp snooping statistics vlan 1

Snooping Statistics for VLAN 1
  General queries received: 0
  Group specific queries received: 0
  Group and source specific queries received: 0
  ASM reports received: 0
  SSM reports received: 0
  IS_INCLUDE messages received: 0
  IS_EXCLUDE messages received: 0
  TO_INCLUDE messages received: 0
  TO_EXCLUDE messages received: 0
  ALLOW messages received: 0
  Block messages received: 0
  Leave messages received: 0
  General queries transmitted: 0
  Group specific queries transmitted: 0
  Group and source specific queries transmitted : 0
  ASM reports transmitted: 0
  SSM reports transmitted: 0
  Leaves transmitted: 0
  Unsuccessful joins received count Per Vlan : 0
  Active/Successful joins received count Per Vlan: 0
  Active Groups count: 0
  Packets dropped: 0
```

4. Clear the statistics for the `VLAN 1`**.**

```
SEFOS# configure terminal
SEFOS(config)# ip igmp snooping clear counters vlan 1
```

5. Verify the configuration information.

```
SEFOS# show ip igmp snooping statistics vlan 1

Snooping Statistics for VLAN 1
  General queries received: 0
  Group specific queries received: 0
  Group and source specific queries received: 0
  ASM reports received: 0
  SSM reports received: 0
  IS_INCLUDE messages received: 0
  IS_EXCLUDE messages received: 0
  TO_INCLUDE messages received: 0
  TO_EXCLUDE messages received: 0
  ALLOW messages received: 0
  Block messages received: 0
  Leave messages received: 0
  General queries transmitted: 0
  Group specific queries transmitted: 0
  Group and source specific queries transmitted : 0
  ASM reports transmitted: 0
  SSM reports transmitted: 0
  Leaves transmitted: 0
  Unsuccessful joins recieved count Per Vlan : 0
  Active/Successful joins recieved count Per Vlan: 0
  Active Groups count: 0
  Packets dropped: 0
```

▼ Clear the Statistics for All VLANs

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Clear the statistics for all of the VLANs.

```
SEFOS(config)# ip igmp snooping clear counters
SEFOS(config)# end
```

3. Review the statistics.

```
SEFOS# show ip igmp snooping statistics

Snooping Statistics for VLAN 1
```

```
General queries received: 0
Group specific queries received: 0
Group and source specific queries received: 0
ASM reports received: 0
SSM reports received: 0
IS_INCLUDE messages received: 0
IS_EXCLUDE messages received: 0
TO_INCLUDE messages received: 0
TO_EXCLUDE messages received: 0
ALLOW messages received: 0
Block messages received: 0
Leave messages received: 0
General queries transmitted: 0
Group specific queries transmitted: 0
Group and source specific queries transmitted : 0
ASM reports transmitted: 0
SSM reports transmitted: 0
Leaves transmitted: 0
Unsuccessful joins recieved count Per Vlan : 0
Active/Successful joins recieved count Per Vlan: 0
Active Groups count: 0
Packets dropped: 0
```

Configuring the General Query Transmission Option

The IGS switch is configured to send IGMP general queries on all of the nonrouter ports when a spanning tree topology change occurs in the network. If the spanning tree mode is RSTP, IGMP general queries are sent on all of the nonrouter ports that are the VLANs member ports present in the switch. If the spanning tree mode is MSTP, IGMP general queries are sent on all of the nonrouter ports of the VLAN that are mapped for the MSTP instance. The IGMP general query transmission option is disabled by default. Before you can configure IGS features, you must configure your network environment, as described in "Topology Example" on page 6.

- "Enable the General Query Transmission Option" on page 33
- "Disable the General Query Transmission Option" on page 33

▼ Enable the General Query Transmission Option

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Enable the transmission of the IGMP general query for any topology change.

```
SEFOS(config)# ip igmp snooping send-query enable
SEFOS(config)# end
```

3. Review the configuration.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
  ----------------------------
  IGMP Snooping globally enabled
  IGMP Snooping is operationally enabled
  IGMP Snooping Enhanced mode is disabled
  Transmit Query on Topology Change globally enabled
  Multicast forwarding mode is MAC based
  Proxy globally disabled
  Proxy reporting globally enabled
  Filter is disabled
  Router port purge interval is 125 seconds
  Port purge interval is 260 seconds
  Report forward interval is 5 seconds
  Group specific query interval is 2 seconds
  Reports are forwarded on router ports
  Group specific query retry count is 2
  Multicast VLAN disabled
  Leave config level is Vlan based
```

▼ Disable the General Query Transmission Option

1. Enter Global Configuration mode.

```
SEFOS# configure terminal
```

2. Disable the query transmission option.

```
SEFOS(config)# ip igmp snooping send-query disable
SEFOS(config)# end
```

3. Review the configuration information.

```
SEFOS# show ip igmp snooping globals
Snooping Configuration
  ----------------------------
  IGMP Snooping globally enabled
  IGMP Snooping is operationally enabled
  IGMP Snooping Enhanced mode is disabled
  Transmit Query on Topology Change globally disabled
  Multicast forwarding mode is MAC based
  Proxy globally disabled
  Proxy reporting globally enabled
  Filter is disabled
  Router port purge interval is 125 seconds
  Port purge interval is 260 seconds
  Report forward interval is 5 seconds
  Group specific query interval is 2 seconds
  Reports are forwarded on router ports
  Group specific query retry count is 2
  Multicast VLAN disabled
  Leave config level is Vlan based
```

▼ Display Statistics

- **View the statistics of various packets received or transmitted.**

```
SEFOS# show ip igmp snooping statistics
Snooping Statistics for VLAN 1
  General queries received: 0
  Group specific queries received: 0
  Group and source specific queries received: 0
  ASM reports received: 2
  SSM reports received: 0
  IS_INCLUDE messages received: 0
  IS_EXCLUDE messages received: 0
  TO_INCLUDE messages received: 0
  TO_EXCLUDE messages received: 0
  ALLOW messages received: 0
```

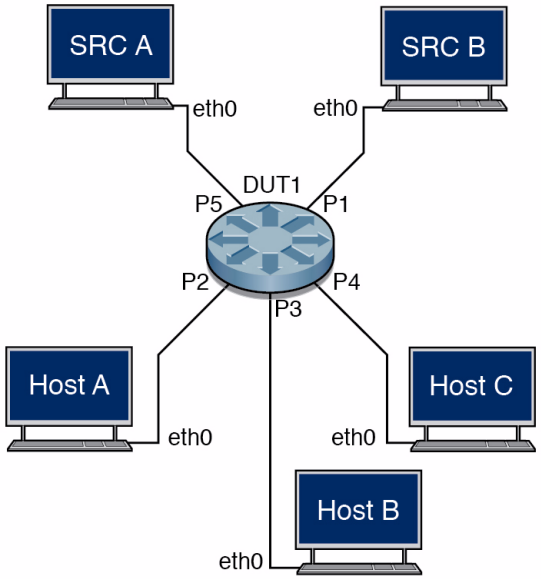
```
Block messages received: 0
Leave messages received: 0
General queries transmitted: 0
Group specific queries transmitted: 0
ASM reports transmitted: 0
SSM reports transmitted: 0
Leaves transmitted: 0
Unsuccessful joins recieved count Per Vlan : 0
Active/Successful joins recieved count Per Vlan: 0
Active Groups count: 0
Packets dropped: 0
```

Flow-Based Configurations

These sections contain procedures that explain how to work with flow-based configurations. The instructions are based on the topology example given here. User input and CLI output reflect the configuration parameters. Your site parameters might vary.

Flow-Based Configuration Example

This illustration shows the example topology that is referenced in these sections.



Configuration Parameters

This table contains the configuration parameters for the components in the example topology.

Node	Port	MAC Address	IP Address
Host A	eth0	00:11:22:33:44:0a	12.0.0.10
Host B	eth0	00:11:22:33:44:0b	12.0.0.20
Host C	eth0	00:11:22:33:44:0c	12.0.0.30
SRC A	eth0	00:11:22:33:44:ee	12.0.0.40
SRC B	eth0	00:11:22:33:44:ff	12.0.0.50
DUT1	P1	00:01:02:03:04:01	12.0.0.1
	P2	00:01:02:03:04:02	
	P3	00:01:02:03:04:03	
	P4	00:01:02:03:04:04	
	P5	00:01:02:03:04:05	

▼ Configure the MAC-Based Multicast Forwarding Mode

If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. On DUT1, configure the multicast forwarding mode for IGS as MAC-based.

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode mac
```

2. Disable GMRP.

```
SEFOS(config)# set gmrp disable
```

3. Enable IGS.

```
SEFOS(config)# ip igmp snooping
```

4. Configure `VLAN 2` in the switch.

```
SEFOS(config)# vlan 2
```

5. Configure the static VLAN entry (`VLAN 2`) with the required ports.

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-4
SEFOS(config-vlan)# exit
```

6. Enter the Interface Configuration mode for Gigabit Ethernet interface `0/1`.

```
SEFOS(config)# interface extreme-ethernet 0/1
```

7. Set the port VLAN ID as `VLAN 2`.

```
SEFOS(config-if)# switchport pvid 2
```

8. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

9. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/2`**.**

```
SEFOS(config)# interface extreme-ethernet 0/2
```

10. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

11. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

12. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/3`**.**

```
SEFOS(config)# interface extreme-ethernet 0/3
```

13. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

14. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

15. **Enter the interface configuration mode for Gigabit Ethernet interface** `0/4`**.**

```
SEFOS(config)# interface extreme-ethernet 0/4
```

16. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

17. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

18. Review the IGS-related configurations.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

19. Review the VLAN information.

```
SEFOS# show vlan id 2

Vlan database
-------------------
Vlan ID             : 2
Member Ports        : Ex0/1, Ex0/2, Ex0/3, Ex0/4
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
-----------------------------------------------------
```

20. Send V1, V2, and V3 join messages for group MG1 (`227.1.1.1`) from host A and host C.

21. **Review the forwarding database.**

```
SEFOS# show ip igmp snooping forwarding-database

Vlan      MAC-Address           Ports
 ------  -------------------    --------
    2    01:00:5e:01:01:01   Ex0/2, Ex0/4
```

22. **Send multicast data packets for MG1 (`227.1.1.1`) from SRC A.**

    The multicast data packet should be received only on host A and host C.

▼ Configure the IP-Based Multicast Forwarding Mode

If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. **On DUT1, configure the multicast forwarding mode for IGS as IP-based.**

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode ip
```

2. **Disable GMRP.**

```
SEFOS(config)# set gmrp disable
```

3. **Enable IGS.**

```
SEFOS(config)# ip igmp snooping
```

4. **Configure `VLAN 2` in the switch.**

```
SEFOS(config)# vlan 2
```

5. **Configure the static VLAN entry (**VLAN 2**) with the required ports.**

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-5
SEFOS(config-vlan)# exit
```

6. **Enter the Interface Configuration mode for Gigabit Ethernet interface** 0/1**.**

```
SEFOS(config)# interface extreme-ethernet 0/1
```

7. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

8. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

9. **Enter Interface Configuration mode for Gigabit Ethernet interface** 0/2**.**

```
SEFOS(config)# interface extreme-ethernet 0/2
```

10. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

11. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

12. **Enter Interface Configuration mode for Gigabit Ethernet interface** 0/3**.**

```
SEFOS(config)# interface extreme-ethernet 0/3
```

13. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

14. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

15. Enter Interface Configuration mode for Gigabit Ethernet interface `0/4`**.**

```
SEFOS(config)# interface extreme-ethernet 0/4
```

16. Set the PVID as `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

17. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

18. Enter Interface Configuration mode for Gigabit Ethernet interface `0/5`**.**

```
SEFOS(config)# interface extreme-ethernet 0/5
```

19. Set the PVID as `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

20. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

21. Review the IGS-related configurations.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
------------------------------
IGMP Snooping globally enabled
IIGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is IP based
Proxy globally disabled
```

```
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

22. Review the VLAN information.

```
SEFOS# show vlan id 2

Vlan database
-------------------
Vlan ID              : 2
Member Ports         : Ex0/1, Ex0/2, Ex0/3, Ex0/4, Ex0/5
Untagged Ports       : None
Forbidden Ports      : None
Name                 :
Status               : Permanent
-----------------------------------------------------
```

23. Send V2 join messages for group MG1 (`227.1.1.1`**) from host A.**

24. Send V3 join messages for group MG1 (`227.1.1.1`**) and SRC B (**`12.0.0.50`**) from host C.**

25. Send multicast data packets for MG1 (`01:00:5e:01:01:01`**) from SRC A (**`12.0.0.40`**) and SRC B (**`12.0.0.50`**).**

26. Review the forwarding database.

```
SEFOS# show ip igmp snooping forwarding-database

Vlan     Source Address    Group Address         Ports
 ------ ---------------------- --------------------  -------
    2       12.0.0.40          227.1.1.1            Ex0/2
    2       12.0.0.50          227.1.1.1            Ex0/2, Ex0/4
```

Host A receives multicast data from both of the sources. However, host C receives multicast data only from SRC B.

▼ Configure a Static Router Port

Multicast router ports can be configured statically, or they can be learned dynamically at run time. Use the instructions in this section to configure a router port statically. If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. On DUT1, configure the multicast forwarding mode for IGS as MAC-based.

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode mac
```

2. Disable GMRP.

```
SEFOS(config)# set gmrp disable
```

3. Enable IGS.

```
SEFOS(config)# ip igmp snooping
```

4. Configure `VLAN 2` in the switch.

```
SEFOS(config)# vlan 2
```

5. Configure the static VLAN entry (`VLAN 2`) with the required ports.

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-5
```

6. Configure the static router port as P1 for this VLAN.

```
SEFOS(config-vlan)# ip igmp snooping mrouter extreme-ethernet 0/1
SEFOS(config-vlan)# exit
```

7. Enter the Interface Configuration mode for Gigabit Ethernet interface `0/1`.

```
SEFOS(config)# interface extreme-ethernet 0/1
```

8. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

9. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

10. **Enter Interface Configuration mode for Gigabit Ethernet interface** 0/2**.**

```
SEFOS(config)# interface extreme-ethernet 0/2
```

11. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

12. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

13. **Enter Interface Configuration mode for Gigabit Ethernet interface** 0/3**.**

```
SEFOS(config)# interface extreme-ethernet 0/3
```

14. **Set the PVID as** VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

15. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

16. **Enter Interface Configuration mode for Gigabit Ethernet interface** 0/4**.**

```
SEFOS(config)# interface extreme-ethernet 0/4
```

17. Set the PVID as VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

18. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

19. Enter Interface Configuration mode for Gigabit Ethernet interface 0/5**.**

```
SEFOS(config)# interface extreme-ethernet 0/5
```

20. Set the PVID as VLAN 2**.**

```
SEFOS(config-if)# switchport pvid 2
```

21. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

22. Review the IGS-related configurations.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

23. **Review the multicast router information.**

```
SEFOS# show ip igmp snooping mrouter

Vlan   Ports
------   -------
    2    Ex0/1(static)
```

24. **Review the VLAN database information.**

```
SEFOS# show vlan id 2

Vlan database
-------------------
Vlan ID             : 2
Member Ports        : Ex0/1, Ex0/2, Ex0/3, Ex0/4, Ex0/5
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
-----------------------------------------------------
```

25. **Send V2 join messages for group MG1 (`227.1.1.1`) from host A.**

26. **Review the forwarding database.**

```
SEFOS# show ip igmp snooping forwarding-database

Vlan  MAC-Address          Ports
 ------  -------------------         --------
    2    01:00:5e:01:01:01   Ex0/1, Ex0/2
```

27. **Send multicast data packets for MG1 (`227.1.1.1`) from SRC B.**

    The multicast data packet should be received only on host A and SRC A.

▼ Configure the IGS Version

The operating version of an IGS switch on a VLAN can be V1, V2, or V3. This section describes the configuration of IGMP version on a VLAN. If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. **On DUT1, configure the multicast forwarding mode for IGS as MAC-based.**

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode mac
```

2. **Disable GMRP.**

```
SEFOS(config)# set gmrp disable
```

3. **Enable IGS.**

```
SEFOS(config)# ip igmp snooping
```

4. **Configure** VLAN 2 **in the switch.**

```
SEFOS(config)# vlan 2
```

5. **Configure the static VLAN entry (**VLAN 2**) with the required ports.**

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-2
```

6. **Configure the version of IGS as V2 for the VLAN.**

```
SEFOS(config-vlan)# ip igmp snooping version v2
SEFOS(config-vlan)# exit
```

7. **Configure** VLAN 3 **in the switch.**

```
SEFOS(config)# vlan 3
```

8. **Configure the static VLAN entry (**VLAN 3**) with the required ports.**

```
SEFOS(config-vlan)# ports extreme-ethernet 0/3-4
```

9. **Configure the version of IGS as V3 for the VLAN.**

```
SEFOS(config-vlan)# ip igmp snooping version v3
SEFOS(config-vlan)# exit
```

10. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/1`.

```
SEFOS(config)# interface extreme-ethernet 0/1
```

11. **Set the PVID as** `VLAN 2`.

```
SEFOS(config-if)# switchport pvid 2
```

12. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

13. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/2`.

```
SEFOS(config)# interface extreme-ethernet 0/2
```

14. **Set the PVID as** `VLAN 2`.

```
SEFOS(config-if)# switchport pvid 2
```

15. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

16. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/3`.

```
SEFOS(config)# interface extreme-ethernet 0/3
```

17. **Set the PVID as** `VLAN 3`.

```
SEFOS(config-if)# switchport pvid 3
```

18. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

19. Enter Interface Configuration mode for Gigabit Ethernet interface `0/4`**.**

```
SEFOS(config)# interface extreme-ethernet 0/4
```

20. Set the PVID as `VLAN 3`**.**

```
SEFOS(config-if)# switchport pvid 3
```

21. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

22. Review the IGS-related configurations.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

23. Review the IGS version in `VLAN 2`**.**

```
SEFOS# show ip igmp snooping vlan 2

Snooping VLAN Configuration for the VLAN 2
     IGMP Snooping enabled
     IGMP configured version is V2
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
```

```
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

24. Review the IGS version in VLAN 3**.**

```
SEFOS# show ip igmp snooping vlan 3

Snooping VLAN Configuration for the VLAN 3
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
     Port Purge Interval is 260 seconds
     Max Response Code is 100, Time is 10 seconds
```

25. Review the VLAN 2 **database.**

```
SEFOS# show vlan id 2

Vlan database
-------------------
Vlan ID             : 2
Member Ports        : Ex0/1, Ex0/2
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
---------------------------------------------------
```

26. Review the VLAN 3 **database.**

```
SEFOS# show vlan id 3

Vlan database
------------------
Vlan ID             : 3
Member Ports        : Ex0/3, Ex0/4
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
---------------------------------------------------
```

27. **Send IGMP V3 queries from host A and IGMP V2 queries from host B.**

28. **Review the IGS version in** VLAN 2**.**

```
SEFOS# show ip igmp snooping vlan 2

Snooping VLAN Configuration for the VLAN 2
  IGMP Snooping enabled
  IGMP configured version is V2
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

29. **Review the IGS version in** VLAN 3**.**

```
SEFOS# show ip igmp snooping vlan 3

Snooping VLAN Configuration for the VLAN 3
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
     Port Purge Interval is 260 seconds
     Max Response Code is 100, Time is 10 seconds
```

30. **Stop sending queries from host A and host B, and wait for the router port-purge interval.**

31. **Review the IGS version in** VLAN 2**.**

```
SEFOS# show ip igmp snooping vlan 2

Snooping VLAN Configuration for the VLAN 2
  IGMP Snooping enabled
  IGMP configured version is V2
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

32. **Review the IGS version in** VLAN 3**.**

```
SEFOS# show ip igmp snooping vlan 3

Snooping VLAN Configuration for the VLAN 3
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Non-Querier
  Snooping switch is acting as Non-Querier
  Query interval is 125 seconds
  Port Purge Interval is 260 seconds
  Max Response Code is 100, Time is 10 seconds
```

▼ Configure Queriers in Flow-Based Configurations

You can configure an IGS switch to send IGMP queries when no IGMP routers are present in a VLAN. A switch must be configured as a querier for a VLAN only when there are no queriers or routers in the network. If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. **On DUT1, configure the multicast forwarding mode for IGS as MAC-based.**

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode mac
```

2. **Disable GMRP.**

```
SEFOS(config)# set gmrp disable
```

3. **Enable IGS.**

```
SEFOS(config)# ip igmp snooping
```

4. **Configure** VLAN 2 **in the switch.**

```
SEFOS(config)# vlan 2
```

5. **Configure the static VLAN entry (**VLAN 2**) with the required ports.**

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-3
```

6. **Configure** VLAN 2 **as querier.**

```
SEFOS(config-vlan)# ip igmp snooping querier
```

7. **Configure the query-interval time as 60 seconds.**

```
SEFOS(config-vlan)# ip igmp snooping query-interval 60
SEFOS(config-vlan)# exit
```

8. **Configure** VLAN 3 **in the switch.**

```
SEFOS(config)# vlan 3
```

9. **Configure the static VLAN entry (**VLAN 3**) with the required ports.**

```
SEFOS(config-vlan)# ports extreme-ethernet 0/4-5
SEFOS(config-vlan)# exit
```

10. **Review the IGS-related configurations.**

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

11. Review the IGS-related information in VLAN 2**.**

```
SEFOS# show ip igmp snooping vlan 2

Snooping VLAN Configuration for the VLAN 2
  IGMP Snooping enabled
  IGMP configured version is V3
  Fast leave is disabled
  Snooping switch is configured as Querier
  Snooping switch is acting as Querier
  Query interval is 60 seconds
  Port Purge Interval is 130 seconds
  Max Response Code is 100, Time is 10 seconds
```

12. Review the configuration information for VLAN 2**.**

```
SEFOS# show vlan id 2

Vlan database
-------------
Vlan ID             : 2
Member Ports        : Ex0/1, Ex0/2, Ex0/3
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
---------------------------------------------------
```

13. Review the configuration information for VLAN 3**.**

```
SEFOS# show vlan id 3

Vlan ID             : 3
Member Ports        : Ex0/4, Ex0/5
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
---------------------------------------------------
```

Because VLAN 2 is configured as a querier, the switch sends a general query every 60 seconds on the member ports of VLAN 2.

▼ Configure Proxy Reporting in Flow-Based Configurations

When proxy reporting is enabled, the switch generates reports and forwards them to the router based on the available host information. If you have questions about the topology used in this section, see "Flow-Based Configuration Example" on page 37. For the default settings, see "Default Settings" on page 7.

1. On DUT1, configure the multicast forwarding mode for IGS as MAC-based.

```
SEFOS# configure terminal
SEFOS(config)# snooping multicast-forwarding-mode mac
```

2. Disable GMRP.

```
SEFOS(config)# set gmrp disable
```

3. Enable IGS.

```
SEFOS(config)# ip igmp snooping
```

4. Enable proxy reporting.

```
SEFOS(config)# ip igmp snooping proxy-reporting
```

5. Configure `VLAN 2` in the switch.

```
SEFOS(config)# vlan 2
```

6. Configure the static VLAN entry (`VLAN 2`) with the required ports.

```
SEFOS(config-vlan)# ports extreme-ethernet 0/1-4
```

7. Configure the static router port as P2 for the VLAN.

```
SEFOS(config-vlan)# ip igmp snooping mrouter extreme-ethernet 0/2
SEFOS(config-vlan)# exit
```

8. **Enter the Interface Configuration mode for Gigabit Ethernet interface** `0/1`**.**

```
SEFOS(config)# interface extreme-ethernet 0/1
```

9. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

10. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

11. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/2`**.**

```
SEFOS(config)# interface extreme-ethernet 0/2
```

12. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

13. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

14. **Enter Interface Configuration mode for Gigabit Ethernet interface** `0/3`**.**

```
SEFOS(config)# interface extreme-ethernet 0/3
```

15. **Set the PVID as** `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

16. **Bring up the interface.**

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
```

17. Enter Interface Configuration mode for Gigabit Ethernet interface `0/4`**.**

```
SEFOS(config)# interface extreme-ethernet 0/4
```

18. Set the PVID as `VLAN 2`**.**

```
SEFOS(config-if)# switchport pvid 2
```

19. Bring up the interface.

```
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

20. Review the IGS-related configurations.

```
SEFOS# show ip igmp snooping globals

Snooping Configuration
----------------------------
IGMP Snooping globally enabled
IIGMP Snooping is operationally enabled
IGMP Snooping Enhanced mode is disabled
Transmit Query on Topology Change globally disabled
Multicast forwarding mode is MAC based
Proxy globally disabled
Proxy reporting globally enabled
Filter is disabled
Router port purge interval is 125 seconds
Port purge interval is 260 seconds
Report forward interval is 5 seconds
Group specific query interval is 2 seconds
Reports are forwarded on router ports
Group specific query retry count is 2
Multicast VLAN disabled
Leave config level is Vlan based
```

21. Review the database information for `VLAN 2`**.**

```
SEFOS# show vlan id 2

Vlan database
-------------
Vlan ID             : 2
Member Ports        : Ex0/1, Ex0/2, Ex0/3, Ex0/4
Untagged Ports      : None
Forbidden Ports     : None
Name                :
Status              : Permanent
-------------------------------------------------------------
```

22. Review the multicast router information.

```
SEFOS# show ip igmp snooping mrouter

Vlan   Ports
------   -------
    2    Ex0/2(static)
```

23. Send an IGMP V2 report from host B and host C.

Only one of the reports should be forwarded to the router port on host A.