Sun Ethernet Fabric Operating System

IGMP Administration Guide

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Contents

Using This Documentation

Oracle's SEFOS implements version 3 of IGMP with the IGMP router functions required by the MRP. This document describes the basic and advanced configuration tasks for the configuration of IGMP in SEFOS.

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
IGMP	Internet Group Management Protocol
Oracle ILOM	Oracle Integrated Lights Out Manager
IP	Internet Protocol
MRP	Multicast Routing Protocol
PIM	Protocol independent muticast
SEFOS	Sun Ethernet Fabric Operating System

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

Protocol Description

These sections describe IGMP and an example topology:

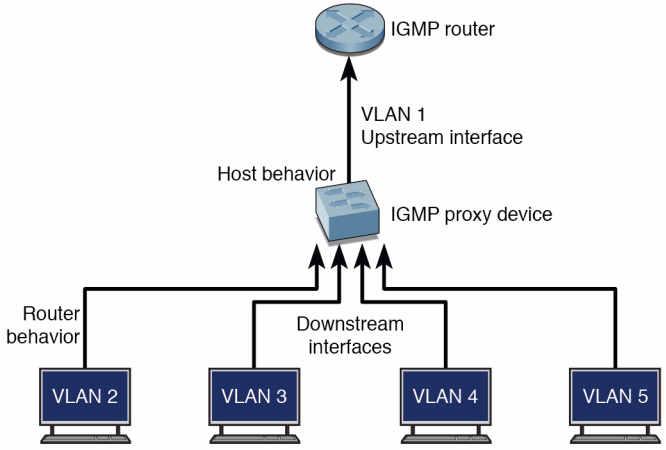
IGMP Protocol

IGMP is used to learn the multicast group membership of the hosts connected to a router. Multicast routing protocols, like PIM, use this information to forward multicast packets that are received by the router. An IGMP proxy learns group membership and forwards multicast traffic based on this information. It does not need to run any multicast routing protocols.

IGMP Topology

The following illustration shows an example topology using an IGMP proxy. This example topology is referenced in all of the procedures in this guide.

The IGMP proxy device performs the router portion of IGMP on the downstream (host) interfaces and the host portion of IGMP on the upstream (router) interfaces. The IGMP proxy device consolidates the reports received on the downstream interfaces and sends summarized reports on the upstream interface. The main use for IGMP proxy is in edge devices.

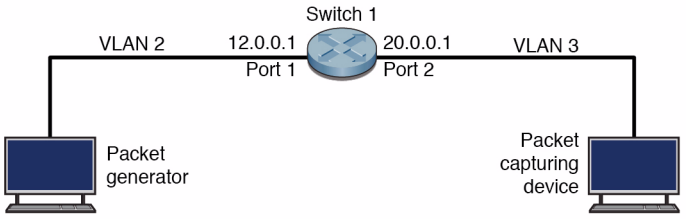

IGMP router
VLAN 1
Upstream interface
Host behavior
IGMP proxy device
Router
behavior
Downstream
interfaces
VLAN 2
VLAN 3
VLAN 4
VLAN 5

Configuring IGMP

These sections describe how to configure IGMP:

Example Topology

The instructions for configuring IGMP are based on the example topology depicted in the following illustration.



Configuration Guidelines

The following guidelines must be met before you configure IGMP:

1. Enable IGMP globally and on the interface on which IGMP is needed.
2. Execute at least one interface configuration command to create the IGMP interface.
3. Enable IGMP globally before enabling the IGMP proxy-service.
4. Disable multicast routing protocols before enabling the IGMP proxy-service.

Default Settings

The following table shows the default settings for IGMP configuration parameters.

Feature	Default Setting
IGMP status	Disabled
IGMP fast leave	Disabled
IGMP version	2
IGMP query interval	125 seconds
IGMP max response time	100 seconds
IGMP robustness value	2
IGMP last member query interval	10 seconds
Debug level	None
IGMP proxy	Disabled

Feature	Default Setting
IGMP proxy mrouter timeout	125 seconds
IGMP proxy mrouter version	3

▼ Enable IGMP Globally

You must enable IGMP globally and on the interface on which IGMP is needed. By default, IGMP is disabled globally.

1. Enable IGMP in the router.

```
SEFOS# configure terminal
SEFOS(config)# set ip igmp enable
SEFOS(config)# end
```

2. Review the configuration information.

```
SEFOS# show ip igmp global-config

IGMP is globally enabled
```

Note – To disable IGMP in the switch, execute the `set ip igmp disable` command.

▼ Enable IGMP on an Individual Interface

By default, IGMP is disabled globally. You must enable IGMP globally and on the interface on which IGMP is needed.

1. Enter Interface Configuration mode for `VLAN 2`**.**

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

2. **Enable IGMP on the interface.**

```
SEFOS(config-if)# set ip igmp enable
SEFOS(config-if)# end
```

3. **Review the configuration information.**

```
SEFOS# show ip igmp interface vlan 2

 vlan2, line protocol is up
 Internet Address is 12.0.0.1/8
 IGMP is enabled on interface
...
```

▼ Enable Fast Leave

1. **Enter Interface Configuration mode for** `VLAN 2`**.**

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

2. **Enable fast leaving.**

```
SEFOS(config-if)# ip igmp immediate-leave
SEFOS(config-if)# end
```

3. **Ensure that fast leave is enabled on the interface.**

```
SEFOS# show ip igmp interface vlan 2

...
 Fast leave is enabled on this interface
...
```

▼ Configure the IGMP Version

1. Enter Interface Configuration mode for VLAN 2**.**

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

2. Configure the IGMP version as 3.

```
SEFOS(config-if)# ip igmp version 3
SEFOS(config-if)# end
```

3. Review the current IGMP router version.

```
SEFOS# show ip igmp interface vlan 2

...
 Current IGMP router version is 3
...
```

▼ Configure the IGMP Query Interval

1. Enter Interface Configuration mode for VLAN 2**.**

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

2. Set the IGMP query interval to 200 seconds.

```
SEFOS(config-if)# ip igmp query-interval 200
SEFOS(config-if)# end
```

3. Review the query interval information.

```
SEFOS# show ip igmp interface vlan 2
```

```
...
IGMP query interval is 200 seconds
...
```

▼ Configure the IGMP Query Maximum Response Time

1. Enter Interface Configuration mode for `VLAN 2`**.**

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

2. Set the maximum response time to 200 seconds.

```
SEFOS(config-if)# ip igmp query-max-response-time 200
SEFOS(config-if)# end
```

3. Review the configuration information.

```
SEFOS# show ip igmp interface

 vlan2, line protocol is up
 Internet Address is 12.0.0.1/8
 IGMP is enabled on interface
 Current IGMP router version is 2
 IGMP query interval is 125 seconds
 Last member query response interval is 10 seconds
 IGMP max query response time is 200 seconds
 Robustness value is 3
 IGMP querying router is 12.0.0.1 (this system)
 Fast leave is disabled on this interface
 No multicast groups joined
```

▼ Configure the IGMP Robustness Value

1. Enter Interface Configuration mode for VLAN 2**.**

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

2. Configure the robustness value as 3.

```
SEFOS(config-if)# ip igmp robustness 3
SEFOS(config-if)# end
```

3. Ensure that the robustness value has changed.

```
SEFOS# show ip igmp interface
...
 Robustness value is 3
...
```

▼ Configure the IGMP Last Member Query Interval

1. Enter Interface Configuration mode for VLAN 2**.**

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

2. Set the last member query interval to 20 seconds.

```
SEFOS(config-if)# ip igmp last-member-query-interval 20
SEFOS(config-if)# end
```

3. **Ensure that the query interval has changed.**

```
SEFOS# show ip igmp interface vlan 2
...
Last member query response interval is 20 seconds
...
```

▼ Configure a Static-Multicast Group Membership

1. **Enter Interface Configuration mode for** `VLAN 2`**.**

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

2. **Add a static entry (**`224.1.0.1`**) for the multicast group.**

```
SEFOS(config-if)# ip igmp static-group 224.1.0.1
SEFOS(config-if)# end
```

3. **Ensure that the multicast groups joined.**

```
SEFOS# show ip igmp interface

...
 Number of multicast groups joined 1
```

4. **Review the IGMP group information.**

```
SEFOS# show ip igmp groups

I - Include Mode,  E - Exclude Mode
S - Static Mbr,    D - Dynamic Mbr

GroupAddress Flg Iface UpTime    ExpiryTime         LastReporter
-------------- --- ------- ---------------- ---------------- ----
224.1.0.1    ES  vlan2  [0d 00:00:22.12] [0d 00:00:00.00] 0.0.0.0
```

▼ Enable the IGMP Proxy Service

You must enable IGMP globally before you enable the IGMP proxy service. You must also disable multicast routing protocols before enabling IGMP proxy service.

1. Enable IGMP.

```
SEFOS# configure terminal
SEFOS(config)# set ip igmp enable
```

2. Enable the IGMP proxy service in the router.

```
SEFOS(config-if)# ip igmp proxy-service
SEFOS(config-if)# end
```

3. Review the configuration information.

```
SEFOS# show ip igmp global config

IGMP is globally enabled
IGMP Proxy is globally enabled in the system
```

▼ Configure an Interface as an Upstream Interface

1. Enter Interface Configuration mode for `VLAN 2`**.**

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

2. Enable IGMP on the interface if it is not already enabled.

```
SEFOS(config-if)# set ip igmp enable
```

3. **Set the interface as an upstream interface.**

```
SEFOS(config-if)# ip igmp-proxy mrouter
SEFOS(config-if)# end
```

4. **Ensure that the IP address has changed.**

```
SEFOS# show ip igmp interface

...
 Internet Address is 12.0.0.1/8
...
```

▼ Configure the Purge Interval for an Upstream Interface

1. **Enter Interface Configuration mode for** `VLAN 2`**.**

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

2. **Set the purge interval to 100 seconds.**

```
SEFOS(config-if)# ip igmp-proxy mrouter-time-out 100
SEFOS(config-if)# end
```

3. **Review the configuration information.**

```
SEFOS# show ip igmp-proxy mrouter

IfName/IfId OperVersion CfgVersion UpTime/VersionExpiryTime
PurgeIntvl
-------------------------------------------------------------------
-----
vlan2   /40   IGMPv3     IGMPv3      [0d 00:00:59.96]/0        100
```

▼ Configure the IGMP Version on an Upstream Interface

1. Enter Interface Configuration mode for VLAN 2**.**

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

2. Set the IGMP version to 2.

```
SEFOS(config-if)# ip igmp-proxy mrouter-version 2
SEFOS(config-if)# end
```

3. Review the configuration information.

```
SEFOS# show ip igmp-proxy mrouter

IfName/IfId OperVersion  CfgVersion UpTime/VersionExpiryTime
PurgeIntvl
-------------------------------------------------------------------
--------
vlan2 /40    IGMPv2      IGMPv2        [0d 00:00:59.96]/0        100
```

▼ Configure the IGMP Proxy

This section shows how to set up an IGMP topology.

1. On the router, create VLAN 2 **and** VLAN 3**, and associate the ports to the corresponding VLAN.**

```
SEFOS# configure terminal
SEFOS(config)# vlan 2
SEFOS(config-vlan)# ports extreme-ethernet 0/1 untagged
extreme-ethernet 0/1
SEFOS(config-vlan)# exit
SEFOS(config)# interface extreme-ethernet 0/1
SEFOS(config-if)# switchport access vlan 2
SEFOS(config-if)# exit
```

```
SEFOS(config)# interface vlan 2
SEFOS(config-if)# shutdown
SEFOS(config-if)# ip address 12.0.0.1 255.0.0.0
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
SEFOS(config)# vlan 3
SEFOS(config-vlan)# ports extreme-ethernet 0/2 untagged
extreme-ethernet 0/2
SEFOS(config-vlan)# exit
SEFOS(config)# interface extreme-ethernet 0/2
SEFOS(config-if)# switchport access vlan 3
SEFOS(config-if)# no shutdown
SEFOS(config-if)# exit
SEFOS(config)# interface vlan 3
SEFOS(config-if)# shutdown
SEFOS(config-if)# ip address 20.0.0.1 255.0.0.0
SEFOS(config-if)# no shutdown
SEFOS(config-if)# end
```

2. Verify the changes to the VLAN configuration.

```
SEFOS# show ip interface

vlan1 is up, line protocol is down
Internet Address is 10.0.0.1/8
Broadcast Address  10.255.255.255

vlan2 is up, line protocol is up
Internet Address is 12.0.0.1/8
Broadcast Address  12.255.255.255

vlan3 is up, line protocol is up
Internet Address is 20.0.0.1/8
Broadcast Address  20.255.255.255
```

3. Review the VLAN database information.

```
SEFOS# show vlan brief

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

```
-------------------------------------------------
Vlan ID             : 3
Member Ports        : Ex0/2
Untagged Ports      : Ex0/2
Forbidden Ports     : None
Name                :
Status              : Permanent
-------------------------------------------------
Vlan ID             : 1
Member Ports        : Ex0/3, Ex0/4, Ex0/5, Ex0/6, Ex0/7, Ex0/8
                      Ex0/9, Ex0/10, Ex0/11, Ex0/12, Ex0/13, Ex0/14
                     Ex0/15, Ex0/16, Ex0/17, Ex0/18, Ex0/19, Ex0/20
                       Ex0/21, Ex0/22, Ex0/23, Ex0/24
Untagged Ports      : Ex0/3, Ex0/4, Ex0/5, Ex0/6, Ex0/7, Ex0/8
                      Ex0/9, Ex0/10, Ex0/11, Ex0/12, Ex0/13, Ex0/14
                     Ex0/15, Ex0/16, Ex0/17, Ex0/18, Ex0/19, Ex0/20
                       Ex0/21, Ex0/22, Ex0/23, Ex0/24
Forbidden Ports     : None
Name                :
Status              : Permanent
-------------------------------------------------
```

4. Enable IGMP and the IGMP proxy service globally on the VLANs.

```
SEFOS# configure terminal
SEFOS(config)# set ip igmp enable
SEFOS(config)# ip igmp proxy-service
SEFOS(config)# interface vlan 2
SEFOS(config-if)# set ip igmp enable
SEFOS(config-if)# exit
SEFOS(config)# interface vlan 3
SEFOS(config-if)# set ip igmp enable
SEFOS(config-if)# end
```

5. Configure `VLAN 2` **as an upstream interface to receive the incoming data packets.**

```
SEFOS# configure terminal
SEFOS(config)# interface vlan 2
SEFOS(config-if)# ip igmp-proxy mrouter
SEFOS(config-if)# end
```

6. For `VLAN 3` **(**`224.1.1.1`**), add a static-multicast group membership.**

```
SEFOS# configure terminal
SEFOS(config)# interface vlan 3
SEFOS(config-if)# ip igmp static-group 224.1.1.1
SEFOS(config-if)# end
```

Note – Adding a static group membership is not required if the device connected to the `VLAN 3` interface is capable of sending an IGMP membership report to the switch.

---

7. Verify the changes to the IGMP configuration.

```
SEFOS# show ip igmp global-config

 IGMP is globally enabled
 IGMP Proxy is globally enabled in the system
```

8. Review the configuration information.

```
SEFOS# show ip igmp interface

 vlan2, line protocol is up
 Internet Address is 12.0.0.1/8
 IGMP is enabled on interface
 Interface is configured as Upstream interface

vlan3, line protocol is up
 Internet Address is 20.0.0.1/8
 IGMP is enabled on interface
 Current IGMP router version is 2
 IGMP query interval is 125 seconds
 Last member query response interval is 10 seconds
IGMP max query response time is 100 seconds
Robustness value is 2
 IGMP querying router is 20.0.0.1 (this system)
 Fast leave is disabled on this interface
 Number of multicast groups joined 1
```

9. Review the IGMP group information.

```
SEFOS# show ip igmp groups

I - Include Mode,  E - Exclude Mode
```

```
S - Static Mbr,    D - Dynamic Mbr

GroupAddress  Flg  Iface  UpTime        ExpiryTime    LastReporter
-----------  ----  ---   -------       ----------     -----------
224.1.1.1     S   vlan3 [0d 00:03:02.86] [0d 00:00:00.00]  0.0.0.0
```

10. **Verify that the multicast data from** `VLAN 2` **is forwarded to** `VLAN 3`**.**

    At the packet generator, create and transmit a valid multicast data packet with destination IP address `224.1.1.1` and source IP address `12.0.0.`*x*. Ensure that the packet is received by the packet capturing device.