



L2 / L3 Switches

Internet Group Management

Protocol (IGMP)

Configuration Guide

Revision 1.0

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1 IGMP Configuration Guide

This document describes the IGMP feature supported in Supermicro Layer 2 / Layer 3 switch products.

The IGMP configurations for the below listed Supermicro switch products are covered.

Top of Rack Switches

- SSE-G24-TG4
- SSE-G48-TG4
- SSE-X24S
- SSE-X3348S
- SSE-X3348T

Blade Switches

- SBM-GEM-X2C
- SBM-GEM-X2C+
- SBM-GEM-X3S+
- SBM-XEM-X10SM

The majority of this document applies to the Supermicro switch products listed above. In any particular sub section however, the contents might vary across these switch product models. In those sections the differences are clearly identified with reference to particular switch product models. If any particular switch product model is not referenced, the reader can safely assume that the content is applicable to all the above listed models.



Throughout this document, the common term “switch” refers to any of the above listed Supermicro switch product models unless a particular switch product model is noted.

1.1 IP Multicast Overview

IP communication may be one of three types:

- Unicast: Host sends packets to a single host
- Broadcast: Host sends packets to all hosts
- Multicast: Host sends packets to a subset of hosts simultaneously

IP multicast routing enables efficient use of network resources for bandwidth intensive services including video and audio. A multicast group is a set of receivers that want to receive a particular data stream. An IP *Multicast Group Address* in the range 224.0.0.0 to 239.0.0.0 is selected for receivers in a

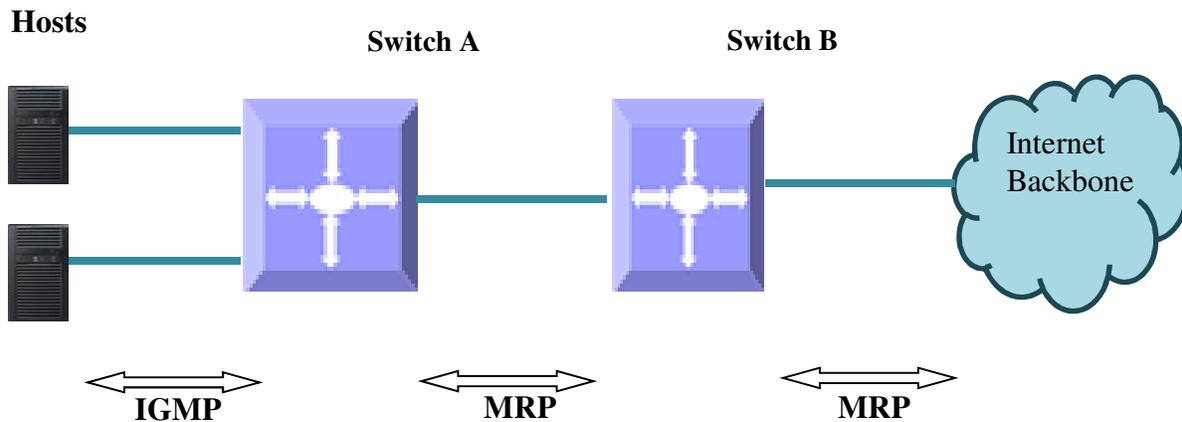
multicast group. Senders transmit IP data using the multicast group address as the destination address to multicast to all group members. Receivers interested in receiving data of a particular group must join the group by signaling a router/switch on their subnet. IGMP is used as the signaling protocol for conveying *group membership*. Network devices along the path from source to receivers forward data only on those ports leading to the receivers rather than flooding all ports.

Membership in a multicast group is dynamic as hosts can join and leave at any time. There is no restriction on the location or number of members in a multicast group. In addition, a host can be a member of more than one multicast group at a time.

Supermicro switches can send and receive multicast traffic by supporting the following multicast features:

- **IGMP:** at the access end of the network that processes hosts announcing their participation in a multicast group(s).
- **Multicast Routing Protocol's (MRP's):** at the enterprise and core of the network for maintaining the senders/receivers database and forwarding data from senders to receivers.

Figure IGMP-1: IP Multicast Routing



1.2 IGMP Basics

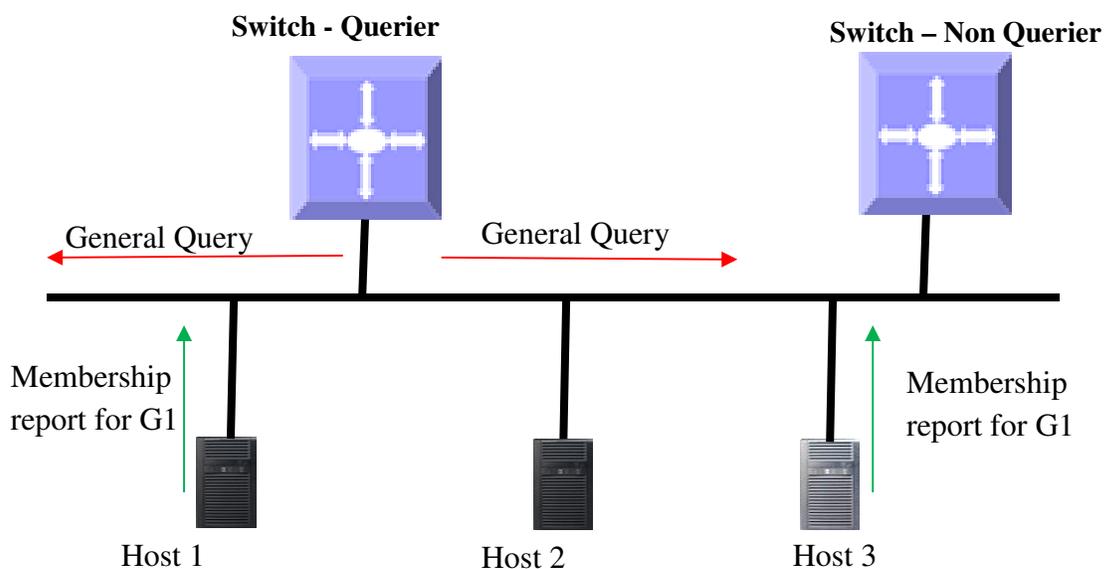
IGMP is an IPv4 protocol used by hosts to request multicast data for a particular group. A switch performs the IGMP function by:

- Sending IGMP query messages to identify receivers interested in particular multicast group(s). IGMP queries are sent only by a querier.
- Processing IGMP report messages from hosts in response to the query message from the querier.

Switches maintain a multicast forwarding table based on the hosts joined for every multicast group and updates the multicast forwarding table when hosts leave multicast groups.

In Figure IGMP-2, the querier switch sends an *IGMP General Query* message on the LAN. Host1 and Host2 respond to the query with the *IGMP report* for G1 Group membership.

Figure IGMP-2: Multicast Forwarding with IGMP



There are 3 versions of IGMP. The basic differences between the versions are:

IGMP v1: Supports basic query-response mechanism to identify active multicast group(s).

IGMP v2: Extends v1 with features like querier elections, IGMP leaves, group-specific queries and maximum response time fields.

IGMP v3: In addition to IGMP v1 and IGMPv2 features, provides support for source-specific queries and reports.



Supermicro switches acts as a querier by default as long as it is a multicast router with a lower IP address on the subnet.

1.3 IGMP Support

Supermicro switches support IGMP for all three IGMP versions (1, 2 and 3).

Supermicro switches support up to 255 multicast groups.

1.4 IGMP Defaults

Parameter	Default Value
IGMP global status	Disabled
IGMP status in VLAN	Disabled
IGMP version	2
Query interval	125 seconds
Query max response time	100 seconds
Robustness value	2
Last member query interval	10 seconds
Immediate leave (fast leave)	Disabled
Static multicast group membership	None

1.5 Enabling IGMP

IGMP is disabled by default in Supermicro switches.

IGMP must be enabled globally and individually in interfaces.

Follow the steps below to enable IGMP.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	set ip igmp enable	Enables IGMP globally.
Step 3	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	Enters the interface configuration mode. <i>interface-type</i> – may be any of the following: gigabit ethernet – gi- extreme-ethernet – ex

		<p>qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using the “no switchport” command in interface configuration mode.</p>
Step 4	set ip igmp enable	Enables IGMP on interface.
Step 5	end	Exits the configuration mode.
Step 6	show ip igmp global-config show ip igmp interface <interface-type> <interface-id>	Displays the IGMP information.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.

The example below shows the commands used to enable IGMP.

Enable IGMP for layer3 VLAN 10

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

```
SMIS# show ip igmp global-config
IGMP is globally enabled
```

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# set ip igmp enable
SMIS(config-if)#end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
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 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

1.6 IGMP Version

The IGMP protocol standard has three versions: v1, v2 and v3. Supermicro switches support IGMP for all three versions. Supermicro IGMP support interoperates with different IGMP versions as defined in the standard IGMP protocol.

The default IGMP version is v2, which is compatible with IGMP versions 1 and 3.

Supermicro switches provide the flexibility for users to configure different IGMP versions on different interfaces.

Follow the steps below to change the IGMP version on any interface.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	Enters the interface configuration mode. <i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan <i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN

		<p>identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using “no switchport” command in interface configuration mode.</p>
Step 3	ip igmp version { 1 2 3 }	Configures IGMP version.
Step 5	end	Exits the configuration mode.
Step 6	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP version information for the given interface.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “no ip igmp version” command resets the IGMP version to its default value of 2.

The example below shows the commands used to configure different versions of IGMP.

Configure IGMP version 3 for layer3 VLAN 10.

```
SMIS# configure terminal
SMIS(config)# interface vlan 10
SMIS(config-if)# ip igmp version 3
SMIS(config-if)# end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on the interface
Current IGMP router version is 3
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 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

1.7 IGMP Queries and Reports

When IGMP is enabled in a Supermicro switch, it assumes itself as the querier. As long as the switch does not receive an IGMP query from another multicast router in the subnet with an IP address lower than itself, it continues to be the IGMP querier on the subnet. If a Supermicro switch acting as querier receives a query from another multicast router on the subnet with an IP address lower than itself, then the switch transitions to a non-querier role and resets a timer based on value of its querier timeout. Upon expiration of the querier timer, a Supermicro switch transitions to querier again if there are no queries from the router with lower IP address, otherwise it continues to remain the non-querier on the subnet.

The querier switch is in charge of sending periodic query messages on the network to determine the presence of any new hosts. Hosts respond to query message from the querier with IGMP report messages, which indicate inclusion or exclusion in a particular multicast group address. The querier consolidates the reports from all hosts and maintains them in an IGMP group table.

There are various parameters that control the query and report messages:

Query Interval: This configures the time interval between transmissions of query messages by the querier.

Max Response Time: This configures the maximum time interval in which the querier will wait to receive reports from the hosts

Robustness Value: This parameter tunes certain intervals used in IGMP protocol and also determines the retransmissions of IGMPv3 report messages to prevent their loss in a network.

1.7.1 Query Interval

The IGMP querier sends IGMP queries periodically to determine if there are any new hosts. This periodic time interval is called the *query interval*.

The default query interval is 125 seconds.

Supermicro switches provide flexibility for users to configure different query interval on different interfaces.

Follow the steps below to change the query interval on any interface.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	Interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using the “no switchport” command in interface configuration mode.</p>
Step 3	ip igmp query-interval <value>	<p>Configures IGMP query interval.</p> <p>The query interval value can be 1-65535 seconds. Default is 125 seconds.</p>
Step 5	end	Exits the configuration mode.

Step 6	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP query interval information for the given interface.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “**no ip igmp query-interval**” command resets the IGMP query interval to its default value of 125.

The example below shows the commands used to configure the IGMP query interval.

Configure IGMP query interval for layer3 VLAN 10

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp query-interval 500
SMIS(config-if)# end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on the interface
Current IGMP router version is 2
IGMP query interval is 500 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 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

```
SMIS# show ip igmp statistics
IGMP statistics for vlan10
Number of general queries received 0
Number of group specific queries received 0
Number of group and source Specific queries received 0
Number of v1/v2 reports received 0
Number of v3 reports received 0
Number of v2 leaves received 0
Number of general queries transmitted 32
Number of group specific queries transmitted 0
Number of group and source specific queries transmitted 0
```

1.7.2 Maximum Query Response Time

For every inclusion report received by the querier, the particular interface entry is added in the IGMP group table for that particular group. A *group membership timeout* is then started for each group/interface entry in the IGMP group table. The *query response interval* is used to calculate the group membership timeout.

Group membership timeout = (robustness value * query interval) + *max query response interval*.

Once a query is received by the hosts, they should respond with IGMP reports within the *max query response time*. The querier deletes the hosts' interface entry from the IGMP group table if no reports are received from the host by the time the group membership timeout is reached.

The default query-max-response time is 100 seconds.

Supermicro switches provide flexibility for users to configure different query-max-response times on different interfaces.

Follow the steps below to change the query-max-response on any interface.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these</p>

		interfaces. Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using the “no switchport” command in interface configuration mode.
Step 3	ip igmp query-max-response-time <value>	Configures IGMP query-max-response time. The value of query-max-response time is 1-255 seconds. Default is 100 seconds.
Step 5	end	Exits the configuration mode.
Step 6	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP query-max-response time information for the given interface.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “**no ip igmp query-max-response-time**” command resets the query-max-response-time to its default of 100.

Configure query-max-response times only on the IGMPv2 interface.

The example below shows the commands used to configure IGMP query maximum response time.

Configure IGMP query maximum response time for layer3 VLAN 10

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp query-max-response-time 255
SMIS(config-if)# end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
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 255 seconds
```

Robustness value is 2
 IGMP querying router is 2.2.2.2 (this system)
 Fast leave is disabled on this interface
 No multicast groups joined

1.7.3 Robustness Value

The robustness value can be fine-tuned to allow for expected packet losses on a subnet. The value of this variable affects certain IGMP message intervals for IGMPv2 and IGMPv3 as specified below:

- *Group membership interval*: Amount of time that must pass before a multicast router determines that there are no more members of a group on a network.
 Group membership interval = (Robustness value * query interval) + query response interval.
- *Other querier present interval*: The robustness value is used to calculate the amount of time that must pass before a multicast router determines that there is no longer another multicast router that is the querier.
 Other querier present interval = (Robustness value * query interval) + (0.5 * query response interval).
- *Last-member query count*: Number of group-specific queries sent before the router assumes that there are no local members of a group. The number of queries is equal to the robustness value.

In IGMPv3, devices send a state-change report whenever the interface state changes. The number of times a state-change report is retransmitted is equal to the robustness value minus one.

The default robustness value is 2. You should increase this value if the subnet is expected to lose packets.

Supermicro switches provide flexibility for users to configure different robustness value on different interfaces.

Follow the steps below to change the robustness value on any interface.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	Enters the interface configuration mode. <i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan <i>interface-id</i> is in <i>slot/port</i> format for all

		<p>physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using the “no switchport” command in interface configuration mode.</p>
Step 3	ip igmp robustness <value>	<p>Configures the IGMP robustness value.</p> <p>The robustness value can be any number from 1-255 seconds. Default is 2 seconds.</p>
Step 5	end	Exits the configuration mode.
Step 6	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP robustness information for the given interface.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “**no ip igmp robustness**” command resets the robustness value to its default value of 2.

Configure the robustness value only on IGMPv2 and IGMPv3 interfaces.

The example below shows the commands to configure the IGMP query maximum response time.

Configure IGMP robustness value for layer3 VLAN 10

SMIS(config)#**configure terminal**

```
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp robustness 10
SMIS(config-if)# end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on the 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 10
IGMP querying router is 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

1.8 Leaving a Multicast Group

Host computers leave multicast groups either silently or by sending IGMP leave messages. Switches monitor the IGMP leave messages sent by host computers. When a switch receives an IGMP leave message for any group on an interface, it does not immediately delete the interface from the group entry on the multicast table. Instead, the switch sends an IGMP group-specific query message on the interface that received the IGMP leave message. If there are any other IGMP hosts on that interface that joined the same multicast group, the switch will receive an IGMP member report as a response. If no hosts respond on that interface, the switch will assume that no other IGMP hosts are connected on that interface for the same group and will delete the corresponding interface from the group entry on the multicast table.



Switches follow the above process only for IGMP version 2 leave messages.

The following parameters are used to control the leave message handling procedure in Supermicro switches.

Group Query Interval – This configures the amount of time a switch will wait to get response for its group specific queries from IGMP hosts.

Immediate Leave – This configures the switch to have the host leave immediately instead of sending group specific query messages to look for other IGMP hosts on the interface that received an IGMP leave message.

These parameters can be configured as explained below.

1.8.1 Last Member Query Interval

Switches send group specific query messages on the interface that received an IGMP leave message. Switches wait for the group query interval time to get a response from the hosts for its group specific query messages. If they receive any host member report as a response, they will drop the leave message received earlier on that interface. If they do not receive any response from hosts for a group query interval time, the switches will remove the interface from the group entry in the multicast forwarding table.

Users can configure this last member query interval. The default last member query interval is 10 seconds.

Follow the steps below to configure the last member query interval.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as</p>

		layer 3 interfaces using the “no switchport” command in the interface configuration mode.
Step 3	ip igmp last-member-query-interval <value>	Configures the last member query interval. The last member query interval value can be any number from 1-255 seconds. Default is 2 seconds.
Step 4	end	Exits the configuration mode.
Step 5	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP last member query interval information for the given interface(s).
Step 6	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “no ip igmp last-member-query-interval” command resets the last member query interval value to its default value of 10 seconds.

The last member query interval should be configured only on an IGMPv2 or IGMPv3 interface.

The example below shows the commands used to configure the last member query interval time.

Configure the last member query interval time as 250 seconds for layer3 VLAN10.

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp last-member-query-interval 250
SMIS(config-if)#end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on interface
Current IGMP router version is 2
IGMP query interval is 125 seconds
Last member query response interval is 250 seconds
IGMP max query response time is 100 seconds
Robustness value is 2
IGMP querying router is 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

1.8.2 Immediate Leave

A switch can be configured to immediately remove the interface from the group entry on the multicast table when any interface receives an IGMP leave message without sending out group specific query messages. This function is called immediate leave and it is configurable per interface basis.

Immediate leave is disabled by default in all interfaces.

Follow the steps below to enable immediate leave for any interface.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using “no switchport” command in interface configuration mode.</p>
Step 3	ip igmp immediate leave	Enables IGMP immediate leave.
Step 4	end	Exits the configuration mode.

Step 5	show ip igmp interface <interface-type> <interface-id>	Displays the IGMP immediate leave information for the given interface.
Step 6	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “no ip igmp immediate leave” command can be used to disable the immediate leave function for any VLAN.

Immediate leave should be configured only on an IGMPv2 interface.

The example below shows the commands used to enable the immediate leave function.

Enable the immediate leave for Layer3 VLAN 10.

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp immediate-leave
SMIS(config-if)# end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on the 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 2.2.2.2 (this system)
Fast leave is enabled on this interface
No multicast groups joined
```

1.9 Static Multicast Group Membership

IGMP group membership can be configured statically on an interface. The static IGMP group entries are used to statically forward multicast data on a particular interface. The entries in the static group membership table exist without any timeout and need to be explicitly deleted.

By default there are no static multicast memberships.

Follow the steps below to configure static group and source membership.

Step	Command	Description
------	---------	-------------

Step 1	configure terminal	Enters the configuration mode.
Step 2	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using “no switchport” command in interface configuration mode.</p>
Step 3	ip igmp static-group <Group Address> [source <Source Address>]	<p>Enables the IGMP static group membership.</p> <p>Group: Mention the IP address of the multicast group in dotted decimal notation.</p> <p>Source (optional): Mention the IP address of the source in dotted decimal notation.</p>
Step 4	end	Exits the configuration mode.
Step 5	show ip igmp groups	Displays the IGMP group membership information.

	show ip igmp sources	
Step 6	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.



The “**no ip igmp static-group <Group Address> [source <Source Address>]**” command can be used to remove a statically configured group and source from an interface.

The ‘source’ option should be used only on an IGMPv3 interface.

The example below shows the commands to configure IGMP Static group membership.

Configure IGMP Static group membership for layer3 VLAN 10

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# ip igmp static-group 225.5.5.5
SMIS(config-if)# ip igmp static-group 235.1.1.1
SMIS(config-if)# end
```

SMIS# **show ip igmp groups**

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

```
GroupAddress  Flg Iface  UpTime      ExpiryTime  LastReporter
-----
225.5.5.5     S  vlan10  [0d 00:00:06.17] [0d 00:00:00.00] 0.0.0.0
235.1.1.1     S  vlan10  [0d 01:20:01.36] [0d 00:00:00.00] 0.0.0.0
```

SMIS# **show ip igmp interface**

```
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is enabled on the 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 2.2.2.2 (this system)
Fast leave is disabled on this interface
Number of multicast groups joined 2
```

1.10 Disabling IGMP

IGMP is disabled by default in Supermicro switches.

If a user needs to disable IGMP after it's already been enabled, it must be disabled globally as well as individually in the interfaces.

Follow the steps below to disable IGMP.

Step	Command	Description
Step 1	configure terminal	Enters the configuration mode.
Step 2	set ip igmp disable	Disables IGMP globally.
Step 3	interface <interface-type> <interface-id> or interface range <interface-type> <interface-id>	<p>Enters the interface configuration mode.</p> <p><i>interface-type</i> – may be any of the following: gigabit ethernet – gi extreme-ethernet – ex qx-ethernet – qx vlan</p> <p><i>interface-id</i> is in <i>slot/port</i> format for all physical interfaces. It may be the VLAN identifier for VLAN interfaces.</p> <p>To configure multiple interfaces, use the “interface range ...” command. To provide a range use a hyphen (-) between the start and end interface numbers. E.g.: int range gi 0/1-10</p> <p>To provide multiple interfaces or ranges, separate with a comma (,). E.g.: int range gi 0/1-10, gi 0/20</p> <p>If multiple interfaces are provided, the next step will enable IGMP on all these interfaces.</p> <p>Note: While configuring IGMP on physical interfaces (gi, ex, qx), make sure those interfaces are configured as layer 3 interfaces using “no switchport” command in interface configuration</p>

		mode.
Step 4	set ip igmp disable	Disables IGMP in VLAN.
Step 5	end	Exits the configuration mode.
Step 6	show ip igmp global-config show ip igmp interface <interface-type> <interface-id>	Displays the IGMP information.
Step 7	write startup-config	Optional step – saves this IGMP configuration to be part of the startup configuration.

The example below shows the commands used to disable IGMP.

Disable the IGMP function assuming a layer3 VLAN 10 switch

```
SMIS(config)#configure terminal
SMIS(config)# set ip igmp disable
SMIS(config)#end
```

```
SMIS# show ip igmp global-config
IGMP is globally disabled
```

```
SMIS(config)#configure terminal
SMIS(config)#interface vlan 10
SMIS(config-if)# set ip igmp disable
SMIS(config-if)#end
```

```
SMIS# show ip igmp interface
vlan10, line protocol is up
Internet address is 2.2.2.2/8
IGMP is disabled 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 2.2.2.2 (this system)
Fast leave is disabled on this interface
No multicast groups joined
```

1.11 IGMP Configuration Example

Configure the following requirements as shown below in Figure IGMP-3.

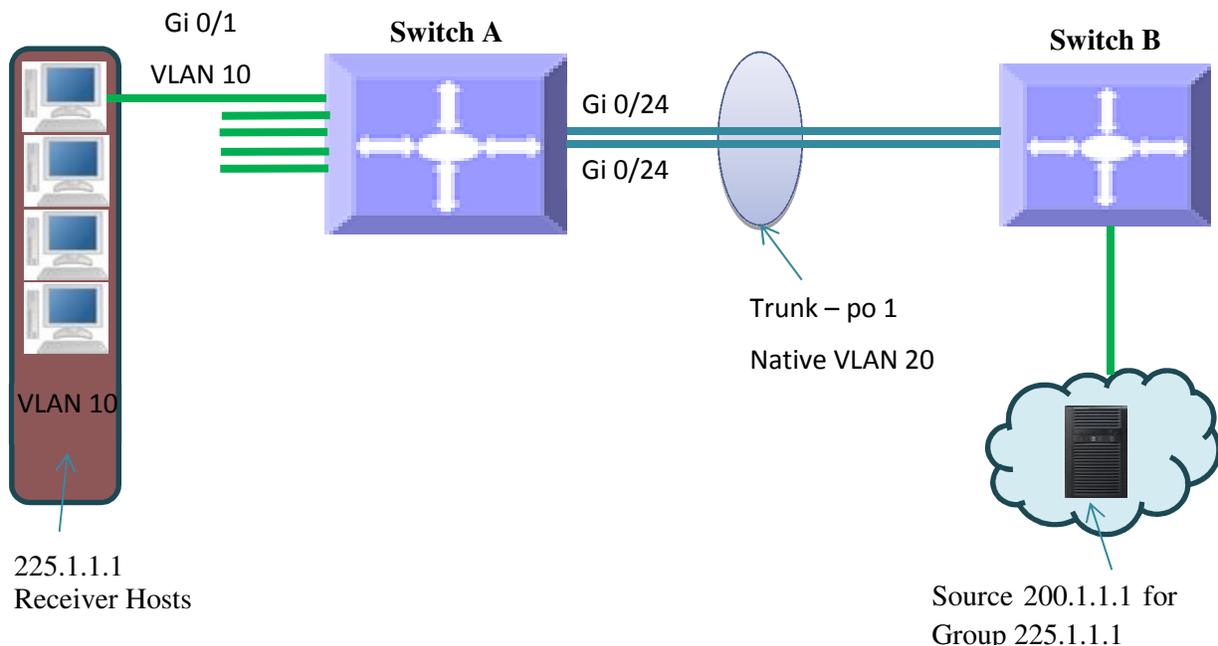
Switch A:

1. Enable IGMP.
2. Configure the static multicast group and source on VLAN10.
3. Configure the immediate leave and query interval.
4. Verify the IGMP group table.

Switch B:

1. Enable IGMP.
2. Verify the IGMP group table.
3. Configure the robustness value.

Figure IGMP-3: IGMP Configuration Example



When an MRP (such as PIM) is enabled on interfaces between Switch A and Switch B, traffic will flow from source 200.1.1.1 to the receivers for group 225.1.1.1

IGMP Configuration on Switch A

```
#Create Layer3 VLAN interface
SMIS(config)# vlan 10
SMIS(config-vlan)# ports Gi 0/1 untagged
SMIS(config-vlan)# exit
SMIS(config)# interface vlan 10
SMIS(config-if)# ip address 10.10.10.10 255.0.0.0
SMIS(config-if)# exit

SMIS(config)# vlan 20
SMIS(config-vlan)# ports Gi 0/24 untagged
SMIS(config-vlan)# exit
SMIS(config)# interface vlan 20
SMIS(config-if)# ip address 20.20.20.1 255.0.0.0
SMIS(config-if)# exit

#Enable IGMP on interface
SMIS(config)# interface vlan 10
SMIS(config-if)# set ip igmp enable
SMIS(config-if)# ip igmp version 3
SMIS(config-if)# ip igmp immediate leave
SMIS(config-if)# ip igmp query-interval 60
SMIS(config-if)# ip igmp static-group 225.1.1.1 source 200.1.1.1
SMIS(config-if)# exit

SMIS(config)# interface vlan 20
SMIS(config-if)# set ip igmp enable
SMIS(config-if)# exit

#Enable IGMP globally
SMIS(config)# set ip igmp enable

# Check the running-configuration for accuracy
SMIS# show running-config

Building configuration...
Switch ID    Hardware Version    Firmware Version
0            SSE-G48-TG4 (P2-01) 1.0.13-7

ip address dhcp
vlan 1
ports gi 0/2-23 untagged
ports gi 0/25-48 untagged
ports ex 0/1-4 untagged
exit
vlan 10
ports gi 0/1 untagged
```

```
exit
vlan 20
 ports gi 0/24 untagged
exit
```

```
interface vlan 1
 ip address dhcp
```

```
interface vlan 10
 ip address 10.10.10.10 255.0.0.0
 set ip igmp enable
 ip igmp immediate-leave
 ip igmp version 3
 ip igmp query-interval 60
 ip igmp static-group 225.1.1.1 source 200.1.1.1
```

```
interface vlan 20
 ip address 20.20.20.1 255.0.0.0
 set ip igmp enable
```

```
exit
set ip igmp enable
```

```
# Save this IGMP configuration.
SMIS# write startup-config
Building configuration, Please wait. May take a few minutes ...
[OK]
SMIS#
```

```
#Display IGMP Global Configuration
SMIS(config)# show ip igmp global-config
IGMP is globally enabled
```

```
#Display IGMP interface information
SMIS(config)# show ip igmp interface
vlan10, line protocol is up
Internet Address is 10.10.10.10/8
IGMP is enabled on interface
Current IGMP router version is 3
IGMP query interval is 60 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 10.10.10.10 (this system)
Fast leave is enabled on this interface
Number of multicast groups joined is 1
```

```
vlan20, line protocol is up
```

Internet address is 20.20.20.1/8
IGMP is enabled on the 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 20.20.20.1 (this system)
Fast leave is disabled on this interface
No multicast groups joined

#Display IGMP group information
SMIS(config)# show ip igmp groups

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

GroupAddress	Flg	Iface	UpTime	ExpiryTime	LastReporter
225.1.1.1	IS	vlan10	[0d 00:35:06.25]	[0d 00:00:00.00]	10.10.10.10

#Display IGMP source information
SMIS(config)# show ip igmp sources

I - Include Mode, E - Exclude Mode
S - Static Mbr, D - Dynamic Mbr
F - Forward List, N - Non-Forward List

GroupAddress	Iface	SrcAddress	Flg	ExpiryTime	LastReporter
225.1.1.1	vlan10	200.1.1.1	ISF	[0d 00:00:00.00]	10.10.10.10

IGMP Configuration on Switch B

#Create layer3 VLAN interface
SMIS(config)# vlan 20
SMIS(config-vlan)# ports Gi 0/24 untagged
SMIS(config-vlan)# exit

SMIS(config)# interface vlan 20
SMIS(config-if)# ip address 20.20.20.5

#Enable IGMP on layer3 VLAN interface
SMIS(config-if)# set ip igmp enable
SMIS(config-if)# ip igmp robustness 5
SMIS(config-if)# exit

#Enable IGMP globally
SMIS(config)# set ip igmp enable

Check the running-configuration for accuracy

SMIS# show running-config

Building configuration...

Switch ID	Hardware Version	Firmware Version
0	SBM-GEM-X3S+ (B4-01)	1.0.14-3

ip address dhcp

vlan 1

ports gi 0/1-23 untagged

ports ex 0/1-3 untagged

exit

vlan 20

ports gi 0/24 untagged

exit

interface vlan 20

ip address 20.20.20.5 255.0.0.0

set ip igmp enable

ip igmp robustness 5

exit

set ip igmp enable

Save this IGMP configuration

SMIS# write startup-config

Building configuration, Please wait. May take a few minutes ...

[OK]

#Display IGMP global configuration

SMIS(config)# show ip igmp global-config

IGMP is globally enabled

#Display IGMP interface information

SMIS(config)# show ip igmp interface

vlan20, line protocol is up

Internet address is 20.20.20.5/8

IGMP is enabled on the interface

Current IGMP router version is 2

IGMP query interval is 125 seconds

Last member query response interval is 10 (1/10 seconds)

IGMP max query response time is 100 (1/10 seconds)

Robustness value is 5

IGMP querying router is 20.20.20.1

Fast leave is disabled on this interface

No multicast groups joined