

Chapter 6

IGMP Configuration Guidelines

To configure the Internet Group Management Protocol (IGMP), include the `igmp` statement:

```
igmp {
  interface interface-name {
    disable;
    ssm-map ssm-map-name;
    static {
      group group {
        source source;
      }
    }
    version version;
  }
  query-interval seconds;
  query-last-member-interval seconds;
  query-response-interval seconds;
  robust-count number;
  traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
      <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
  }
}
```

You can include this statement at the following hierarchy levels:

- [edit protocols]
- [edit logical-routers *logical-router-name* protocols]

For an overview of logical routers and a detailed example of logical router configuration, see the logical routers chapter of the *JUNOS Feature Guide*.

By default, IGMP is automatically enabled on all broadcast interfaces on which you configure the Distance Vector Multicast Routing Protocol (DVMRP) or Protocol Independent Multicast (PIM).

This chapter describes the following tasks for configuring IGMP:

- Minimum IGMP Configuration on page 50
- Enabling IGMP on page 50
- Modifying the IGMP Host-Query Message Interval on page 51
- Modifying the IGMP Query Response Interval on page 51
- Modifying the Last-Member Query Interval on page 52
- Modifying the Robustness Variable on page 52
- Changing the IGMP Version on page 53
- Enabling IGMP Static Group Membership on page 53
- Tracing IGMP Protocol Traffic on page 54
- Disabling IGMP on page 55

Minimum IGMP Configuration

IGMP is automatically enabled on all broadcast interfaces when you configure PIM or DVMRP. All IGMP configuration statements are optional.

Enabling IGMP

IGMP is automatically enabled on all broadcast interfaces when you configure PIM or DVMRP.

Optionally, you can specify the interface or interfaces on which to enable IGMP. If you do not specify any interfaces, IGMP is enabled on all broadcast interfaces. To enable IGMP explicitly, include the `igmp` statement:

```
igmp {
  interface interface-name;
}
```

You can include this statement at the following hierarchy levels:

- [edit protocols]
- [edit logical-routers *logical-router-name* protocols]

For information about specifying interface names, see the *JUNOS Network Interfaces Configuration Guide*.

Modifying the IGMP Host-Query Message Interval

The IGMP querier router periodically sends general host-query messages. These messages solicit group membership information and are sent to the all-systems multicast group address, 224.0.0.1.

By default, host-query messages are sent every 125 seconds. You can change this interface to change the number of IGMP messages sent on the subnet.

To modify this interval, include the `query-interval` statement:

```
query-interval seconds;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp]
- [edit logical-routers *logical-router-name* protocols igmp]

The query interval value can be from 1 through 1024 seconds.

Modifying the IGMP Query Response Interval

The query response interval is the maximum amount of time that can elapse between when the querier router sends a host-query message and when it receives a response from a host. Varying this interval allows you to adjust the burst peaks of IGMP messages on the subnet.

By default, the query response interval is 10 seconds. To modify this interval, include the `query-response-interval` statement:

```
query-response-interval seconds;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp]
- [edit logical-routers *logical-router-name* protocols igmp]

The query response interval can be from 1 through 1024 seconds. It must be less than the host-query message interval.

Modifying the Last-Member Query Interval

The last-member query interval is the maximum amount of time between group-specific query messages, including those sent in response to leave-group messages. You can lower this interval to reduce the amount of time it takes a router to detect the loss of the last member of a group.

The default last-member query interval is 1 second. To modify this interval, include the `query-last-member-interval` statement:

```
query-last-member-interval seconds;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp]
- [edit logical-routers *logical-router-name* protocols igmp]

The last-member query interval can be from 1 through 1024 seconds.

Modifying the Robustness Variable

The IGMP robustness variable provides fine-tuning to allow for expected packet loss on a subnet. The value of the robustness variable is used in calculating the following IGMP message intervals:

- Group member interval—Amount of time that must pass before a multicast router decides that there are no more members of a group on a network. This interval is calculated as follows: (robustness variable x query-interval) + (1 x query-response-interval).
- Other querier present interval—Amount of time that must pass before a multicast router decides that there is no longer another multicast router that is the querier. This interval is calculated as follows: (robustness variable x query-interval) + (0.5 x query-response-interval).
- Last-member query count—Number of group-specific queries sent before the router assumes there are no local members of a group. The default number is the value of the robustness variable.

By default, the robustness variable is set to 2. You might want to increase this value if you expect a subnet to lose packets. To change the value of the robustness variable, include the `robust-count` statement:

```
robust-count number;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp]
- [edit logical-routers *logical-router-name* protocols igmp]

The number can be from 2 through 10.

Changing the IGMP Version

By default, the router runs IGMP version 2. To change to version 3 (for source-specific multicast [SSM] functionality), include the `version` statement:

```
version 3;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp interface *interface-name*]
- [edit logical-routers *logical-router-name* protocols igmp interface *interface-name*]

To enable SSM functionality, you must configure version 3 on the host and the host's directly connected router.



NOTE: Routers running different versions of IGMP negotiate the lowest common version of IGMP that is supported by hosts on their subnet and operate in that version.

If you have already configured the router to use IGMP version 1 and then configure it to use IGMP version 2, the router continues to use IGMP version 1 for up to 6 minutes and then uses IGMP version 2.

Enabling IGMP Static Group Membership

You can create IGMP static group membership to test multicast forwarding without a receiver host. When you enable IGMP static group membership, data is forwarded to an interface without receiving membership reports from host members.

When you configure static IGMP group entries on point-to-point links that connect routers to a rendezvous point (RP), the static IGMP group entries do not generate join messages toward the RP.

To configure IGMP static membership, include the `static` statement. Then specify the group, or the group and its source or sources:

```
static {
  group group {
    source source;
  }
}
```



NOTE: You must specify a unique address for each group.

You can include this statement at the following hierarchy levels:

- [edit protocols igmp interface *interface-name*]
- [edit logical-routers *logical-router-name* protocols igmp interface *interface-name*]

Example: IGMP Static Group Membership

Configure IGMP static membership on the interface where the data is to be forwarded, and specify the groups 239.255.0.1 and 232.1.1.1 with the sources 10.1.1.1 and 10.1.1.2:

```
[edit]
protocols {
  igmp {
    interface ge-1/1/1.0 {
      static {
        group 239.255.0.1;
        group 232.1.1.1 {
          source 10.1.1.1;
          source 10.1.1.2;
        }
      }
    }
  }
}
```

Tracing IGMP Protocol Traffic

To trace IGMP protocol traffic, specify options to the `traceoptions` statement at the `[edit routing-options]` or `[edit logical-routers logical-router-name routing-options]` hierarchy level. Options applied at the routing options level trace all packets, and options applied at the protocol level trace only IGMP traffic.

You can specify IGMP-specific options by including the `traceoptions` statement:

```
traceoptions {
  file name <replace> <size size> <files number> <no-stamp>
    <(world-readable | no-world-readable)>;
  flag flag <flag-modifier> <disable>;
}
```

You can include this statement at the following hierarchy levels:

- `[edit protocols igmp]`
- `[edit logical-routers logical-router-name protocols igmp]`

You can specify the following IGMP-specific options in the IGMP `flag` statement:

- `leave`—Trace leave-group messages (for IGMP version 2 only).
- `mtrace`—Trace mtrace packets. Use the `mtrace` command to troubleshoot the software.
- `packets`—Trace all IGMP packets.
- `query`—Trace IGMP membership query messages, including general and group-specific queries.
- `report`—Trace membership report messages.

To trace the paths of multicast packets, use the `mtrace` command, as described in the *JUNOS Protocols, Class of Service, and Systems Basics Management Command Reference*.

For information about tracing and global tracing options, see the *JUNOS Routing Protocols Configuration Guide*.

Example: Tracing IGMP Protocol Traffic

Trace only unusual or abnormal operations to the file `routing-log`, and trace all IGMP packets to the file `igmp-log`:

```
[edit]
routing-options {
  traceoptions {
    file routing-log;
    flag errors;
  }
}
protocols {
  igmp {
    traceoptions {
      file igmp-log;
      flag packets;
    }
  }
}
```

Disabling IGMP

To disable IGMP on an interface, include the `disable` statement:

```
disable;
```

You can include this statement at the following hierarchy levels:

- [edit protocols igmp interface *interface-name*]
- [edit logical-routers *logical-router-name* protocols igmp interface *interface-name*]

