

Chapter 9

MLD Configuration Guidelines

To configure the Multicast Listener Discovery (MLD) protocol, include the `mld` statement:

```
mld {
  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, MLD is automatically enabled on all broadcast interfaces when you configure Protocol Independent Multicast (PIM) or the Distance Vector Multicast Routing Protocol (DVMRP).

This chapter describes the following tasks for configuring MLD:

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Minimum MLD Configuration

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

Enabling MLD

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

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

```
mld {
  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 sections about interface naming in the *JUNOS Network Interfaces Configuration Guide*.

Modifying the MLD Version

By default, the router supports MLD version 1 (MLDv1). To enable the router to use MLD version 2 (MLDv2) for source-specific multicast (SSM) *only*, include the `version 2` statement.

```
version 2;
```

You can include this statement at the following hierarchy levels:

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

For more information about SSM, see “Source-Specific Multicast” on page 129.

Modifying the MLD Host-Query Message Interval

The MLD querier router periodically sends general host-query messages. These messages solicit group membership information and are sent to the `link-scope all-nodes` address `FF02::1`.

By default, host-query messages are sent every 125 seconds. You can change the number of MLD messages sent on the subnet by changing the query interval value. The larger the value, the less often MLD queries are sent.

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

```
query-interval seconds;
```

You can include this statement at the following hierarchy levels:

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

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

Modifying the MLD 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 MLD messages on the subnet. Larger intervals create more widely spaced node responses and result in less bursty traffic.

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

The query response interval can range 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 done messages sent on the link-scope-all-routers address FF02::2. 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 mld]
- [edit logical-routers *logical-router-name* protocols mld]

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

Modifying the Robustness Variable

The MLD 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 MLD 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 mld]
- [edit logical-routers *logical-router-name* protocols mld]

The number can be from 2 through 10.

Enabling MLD Static Group Membership

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

To configure MLD 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 mld interface *interface-name*]
- [edit logical-routers *logical-router-name* protocols interface *interface-name*]

Example: MLD Static Group Membership

Configure MLD static membership on the interface where the data is to be forwarded, and specify the groups ff02::1:ff05:1a8d and ff02::1:ffa8:c34a with the source fe80::2e0:81ff:fe05:1a8d:

```
[edit ]
protocols {
  mld {
    interface fe-1/0/1.0 {
      static {
        group ff02::1:ff05:1a8d;
        group ff02::1:ffa8:c34a {
          source fe80::2e0:81ff:fe05:1a8d;
        }
      }
    }
  }
}
```

Tracing MLD Protocol Traffic

To trace MLD protocol traffic, you can specify options in the global `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 MLD-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 mld]
- [edit logical-routers *logical-router-name* protocols mld]

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

- `leave`—Trace leave-group messages (for version 2 only).
- `mtrace`—Trace mtrace packets. Use the `mtrace` command to troubleshoot the software.
- `packets`—Trace all MLD packets.

- **query**—Trace MLD 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 System Basics and Services Command Reference*.

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

Example: Tracing MLD Protocol Traffic

Trace only unusual or abnormal operations to the file **routing-log**, and trace all MLD packets to the file **mld-log**:

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

Disabling MLD

To disable MLD on an interface, include the **disable** statement:

```
mld {
  interface interface-name;
  disable;
}
```

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 sections about interface naming in the *JUNOS Network Interfaces Configuration Guide*.

