

Chapter 27

Neighbor Discovery Configuration Guidelines

To configure neighbor discovery, you include the following statements. You configure router advertisement on a per-interface basis.

```
protocols {
  router-advertisement {
    interface interface-name {
      current-hop-limit number;
      default-lifetime seconds;
      (managed-configuration | no-managed-configuration);
      max-advertisement-interval seconds;
      min-advertisement-interval seconds;
      (other-stateful-configuration | no-other-stateful-configuration);
      prefix prefix {
        (autonomous | no-autonomous);
        (on-link | no-on-link);
        preferred-lifetime seconds;
        valid-lifetime seconds;
      }
      reachable-time milliseconds;
      retransmit-timer milliseconds;
      traceoptions {
        file name <replace> <size size> <files number> <no-stamp>
          <(world-readable | no-world-readable)>;
        flag flag <detail> <disable>;
      }
    }
  }
}
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.

This chapter describes the following tasks for configuring and monitoring neighbor discovery router advertisement messages:

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Minimum Neighbor Discovery Configuration

To configure the router to send router advertisement messages, you must include at least the following statements in the configuration. All other router advertisement configuration statements are optional.

```
[edit]
protocols {
  router-advertisement {
    interface interface-name {
      prefix prefix;
    }
  }
}
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.



NOTE: When you configure neighbor discovery router advertisement on an interface, you must also configure family inet6 at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level. For more information about the family inet6 statement, see the *JUNOS Network Interfaces and Class of Service Configuration Guide*.

Configuring Router Advertisement on an Interface

To configure an interface to send router advertisement messages, include the interface statement:

```
[edit protocols router-advertisement]
interface interface-name;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

Specify the interface name in the following format:

```
physical<:channel>.logical
```

For more information about interface names, see the *JUNOS Network Interfaces and Class of Service Configuration Guide*.

Configuring the Hop Limit

The current hop limit field in the router advertisement messages indicates the default value placed in the hop count field of the IP header for outgoing packets. To configure the hop limit, include the `current-hop-limit` statement:

```
[edit protocols router-advertisement interface interface-name]  
  current-hop-limit number;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

The default hop limit is 64.

Modifying the Default Router Lifetime

The default lifetime in router advertisement messages indicates the lifetime associated with the default router. To modify the default lifetime timer, include the `default-lifetime` statement:

```
[edit protocols router-advertisement interface interface-name]  
  default-lifetime seconds;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

By default, the default router lifetime is three times the maximum advertisement interval. For more information about the maximum advertisement interval, see “Configuring the Frequency of Router Advertisements” on page 436.

Enabling Stateful Autoconfiguration

You can set two fields in the router advertisement message to enable stateful autoconfiguration on a host: the managed configuration field and the other stateful configuration field. Setting the managed configuration field enables the host to use a stateful autoconfiguration protocol for address autoconfiguration, along with any stateless autoconfiguration already configured. Setting the other stateful configuration field enables autoconfiguration of other nonaddress-related information.

By default, stateful autoconfiguration is disabled.

To set the managed configuration field and enable address autoconfiguration, include the `managed-configuration` statement:

```
[edit protocols router-advertisement interface interface-name]  
  managed-configuration;
```

To disable managed configuration field, include the `no-managed-configuration` statement:

```
[edit protocols router-advertisement interface interface-name]  
no-managed-configuration;
```

To set the other stateful configuration field and enable autoconfiguration of other types of information, include the `other-stateful-configuration` statement:

```
[edit protocols router-advertisement interface interface-name]  
other-stateful-configuration;
```

To disable other stateful configuration, include the `no-other-stateful-configuration` statement:

```
[edit protocols router-advertisement interface interface-name]  
no-other-stateful-configuration;
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.

Configuring the Frequency of Router Advertisements

The router sends router advertisements on each interface configured to transmit messages. The advertisements include route information and indicate to network hosts that the router is operational. The router sends these messages periodically, with a time range defined by minimum and maximum values.

To modify the router advertisement interval, include the `min-advertisement-interval` and `max-advertisement-interval` statements:

```
[edit protocols router-advertisement interface interface-name]  
min-advertisement-interval seconds;  
max-advertisement-interval seconds;
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.

By default, the maximum advertisement interval is 600 seconds and the minimum advertisement interval is one-third the maximum interval, or 200 seconds.

Modifying the Reachable Time Limit

After receiving a reachability confirmation from a neighbor, a node considers that neighbor reachable for a certain amount of time without receiving another confirmation. This mechanism is used for neighbor unreachability detection, a mechanism for finding link failures to a target node.

To modify the reachable time limit, include the reachable-time statement:

```
[edit protocols router-advertisement interface interface-name]
reachable-time milliseconds;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

By default, the reachable time period is 0 milliseconds.

Modifying the Frequency of Neighbor Solicitation Messages

The retransmit timer determines the retransmission frequency of neighbor solicitation messages. This timer is used to detect when a neighbor has become unreachable and to resolve addresses. To modify the retransmit timer, include the retransmit-timer statement:

```
[edit protocols router-advertisement interface interface-name]
retransmit-timer milliseconds;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

By default, the retransmit timer is 0 milliseconds.

Configuring Prefix Information

Router advertisement messages carry prefixes and information about them. A prefix is onlink when it is assigned to an interface on a specified link. The prefixes specify whether they are onlink or not onlink. A node considers a prefix to be onlink if it is represented by one of the link's prefixes, a neighboring router specifies the address as the target of a redirect message, a neighbor advertisement message is received for the (target) address, or any neighbor discovery message is received from the address. These prefixes are also used for address autoconfiguration. The information about the prefixes specifies the lifetime of the prefixes, whether the prefix is autonomous, and whether the prefix is onlink.

You can perform the following tasks when configuring the prefix information:

- Setting the Prefix for Onlink Determination on page 438

- Setting the Prefix for Stateless Address Autoconfiguration on page 438

- Configuring the Preferred Lifetime on page 438

- Configuring the Valid Lifetime on page 439

Setting the Prefix for Onlink Determination

You can specify prefixes in the router advertisement messages as onlink. When set as onlink, the prefixes are used for onlink determination. By default, prefixes are onlink.

To explicitly set prefixes as onlink, include the on-link statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
on-link;
```

To set prefixes as not onlink, include the no-on-link statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
no-on-link;
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.

Setting the Prefix for Stateless Address Autoconfiguration

You can specify prefixes in the router advertisement messages as autonomous. When set as autonomous, the prefixes are used for stateless address autoconfiguration. By default, prefixes are autonomous.

To explicitly specify prefixes as autonomous, include the autonomous statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
autonomous;
```

To specify prefixes as not autonomous, include the no-autonomous statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
no-autonomous;
```

For a list of hierarchy levels at which you can configure these statements, see the statement summary sections for these statements.

Configuring the Preferred Lifetime

The preferred lifetime for the prefixes in the router advertisement messages specifies how long the prefix generated by stateless autoconfiguration remains preferred. By default, the preferred lifetime is set to 604,800 seconds.

To configure the preferred lifetime, include the preferred-lifetime statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
preferred-lifetime seconds;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

If you set the preferred lifetime to 0xffffffff, the lifetime is infinite.

The preferred lifetime value must never exceed the valid lifetime value.

Configuring the Valid Lifetime

The valid lifetime for the prefixes in the router advertisement messages specifies how long the prefix remains valid for onlink determination. By default, the valid lifetime is set to 2,592,000 seconds.

To configure the valid lifetime, include the valid-lifetime statement:

```
[edit protocols router-advertisement interface interface-name prefix prefix]
  valid-lifetime seconds;
```

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.

If you set the valid lifetime to 0xffffffff, the lifetime is infinite.

The valid lifetime value must never be smaller than the preferred lifetime value.

Tracing Router Advertisement Traffic

To trace router advertisement traffic, you can specify options in the global traceoptions statement at the [edit routing-options] hierarchy level, and you can specify router advertisement options by including the traceoptions statement:

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

For a list of hierarchy levels at which you can configure this statement, see the statement summary section for this statement.



NOTE: Use the traceoption flags detail and all with caution. These flags may cause the CPU to become very busy.
