

Chapter 14

RIPng Configuration Guidelines

To configure Routing Information Protocol Next-Generation (RIPng), you include statements at the [edit protocols ripng] hierarchy level of the configuration. You can include the following statements in the configuration:

```
protocols {
  ripng {
    import [ policy-names ];
    metric-in metric;
    receive <none>;
    send <none>;
    traceoptions {
      file name <replace> <size size> <files number> <no-stamp>
        <(world-readable | no-world-readable)>;
      flag flag <flag-modifier> <disable>;
    }
    group group-name {
      export [ policy-names ];
      metric-out metric;
      preference number;
      neighbor neighbor-name {
        import [ policy-names ];
        metric-in metric;
        receive <none>;
        send <none>;
      }
    }
  }
}
```

By default, RIPng is disabled.



Note

By default, RIPng routes are not redistributed. You must configure export policy needs to redistribute RIPng routes.

To have a router exchange routes with other routers, you must configure RIPng groups and neighbors. RIPng routes received from routers not configured as RIPng neighbors are ignored. Likewise, RIPng routes are advertised only to routers configured as RIPng neighbors.

This chapter discusses the following topics that provide information for configuring and monitoring RIPng:

Minimum RIPng Configuration on page 168

Define RIPng Global Properties on page 169

Define RIPng Neighbor Properties on page 169

Modify the Incoming Metric on page 169

Configure Update Messages on page 169

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Configure Group-Specific Properties on page 170

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For a configuration example, see “Example: Configure RIPng” on page 173.

Minimum RIPng Configuration

For a router to accept RIPng routes, you must configure at least one RIPng group and the associated neighbor. Routes received from routers that are not configured as neighbors are ignored. All other RIPng configuration statements are optional. Include one neighbor statement for each interface on which you want to receive routes. The local router imports all routes by default from this neighbor and does not advertise routes.

```
[edit]
protocols {
  ripng {
    group group-name {
      neighbor interface-name;
    }
  }
}
```



Note

When you configure RIPng 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 “Configure the IPv6 Family on the Interface” on page 42.

Define RIPng Global Properties

To define RIPng global properties, which apply to all RIPng neighbors, include one or more of the following statements at the [edit protocols ripng] hierarchy level. These statements are explained in separate sections.

```
[edit protocols ripng]
import [ policy-names ];
metric-in metric;
receive receive-options;
send send-options;
```

Define RIPng Neighbor Properties

To define neighbor-specific properties, include one or more of the following statements at the [edit protocols ripng group *group-name*] hierarchy level. The statements are explained in separate sections.

```
[edit protocols ripng group group-name]
neighbor neighbor-name {
  import [ policy-names ];
  metric-in metric;
  receive receive-options;
  send send-options;
}
```

Modify the Incoming Metric

By default, RIPng imports routes from the neighbors configured with the neighbor statement. These routes include those learned from RIPng as well as those learned from other protocols. By default, routes that RIPng imports from its neighbors have a metric of 1 added to the current route metric.

To change the default metric to be added to incoming routes, include the metric-in statement:

```
metric-in metric;
```

metric can be a value from 1 through 15. A value of 16 indicates infinity, or unreachable.

To configure the incoming metric globally for all RIPng neighbors, include the metric statement at the [edit protocols ripng] hierarchy level. To configure it for an individual neighbor, include the statement at the [edit protocols ripng group *group-name* neighbor *neighbor-name*] hierarchy level.

Configure Update Messages

You can enable and disable the sending or receiving of update messages. By default, sending and receiving update messages is enabled. To disable the sending and receiving of update messages, include the receive none and send none statements:

```
receive none;
send none;
```

To enable the sending and receiving of update messages, include the receive and send statements:

```
receive;
send;
```

To configure the update messages globally for all RIPng neighbors, include the receive and send statements at the [edit protocols ripng] hierarchy level. To configure update messages for an individual neighbor, include the statements at the [edit protocols ripng group *group-name* neighbor *neighbor-name*] hierarchy level.

Apply Import Policy

To filter routes being imported by the local router from its neighbors, include the import statement and list the names of one or more policies to be evaluated. If you specify more than one policy, they are evaluated in order (first to last) and the first matching policy is applied to the route. If no match is found, the local router does not import any routes.

```
[edit protocols ripng]
import [ policy-names ];
```

To configure import policy globally for all RIPng neighbors, include the import statement at the [edit protocols ripng] hierarchy level. To configure it for an individual neighbor, include the statement at the [edit protocols ripng group *group-name* neighbor *neighbor-name*] hierarchy level.

Configure Group-Specific Properties

You can group together neighbors that share the same export policy and export metric defaults. You configure group-specific RIPng properties by including the group statement at the [edit protocols ripng] hierarchy level.

```
[edit protocols ripng]
group group-name {
  export [ policy-names ];
  metric-out metric;
  neighbor {
    neighbor-options;
  }
  preference number;
}
```

Each group must contain at least one neighbor. You should create a group for each export policy that you have. For information about configuring neighbors, see “Define RIPng Global Properties” on page 169.

This section discusses the following tasks:

Apply Export Policy on page 171

Control Route Preference on page 171

Modify the Outgoing Metric on page 171

Apply Export Policy

By default, RIPng does not export routes it has learned to its neighbors. To have RIPng export routes, apply one or more export policies. To apply export policies and to filter routes being exported from the local router to its neighbors, include the export statement and list the name of the policy to be evaluated.

```
[edit protocols ripng group group-name]  
export [ policy-names ];
```

To configure an export policy globally for all RIPng neighbors, include the export statement at the [edit protocols ripng group *group-name*] hierarchy level. To configure it for an individual neighbor, include the statement at the [edit protocols ripng group *group-name* neighbor *neighbor-name*] hierarchy level.

You can define one or more export policies. If no routes match the policies, the local router does not export any routes to its neighbors. Export policies override any metric values determined through calculations involving the metric-in and metric-out values.

Control Route Preference

By default, the JUNOS software assigns a preference of 100 to routes that originate from RIPng. When the JUNOS software determines a route's preference to become the active route, the software selects the route with the lowest preference and installs this route into the forwarding table. (For more information about preferences, see "Route Preferences" on page 62.)

To modify the default RIPng preference value, include the preference statement at the [edit protocols ripng group *group-name*] hierarchy level:

```
[edit protocols ripng group group-name]  
preference preference;
```

preference can be a value from 0 to 4,294,967,295 ($2^{32} - 1$).

Modify the Outgoing Metric

If you configure an export policy, RIPng exports routes it has learned to the neighbors configured with the neighbor statement.

If a route being exported was learned from a member of the same RIPng group, the metric associated with that route (unless modified by an export policy) is the normal RIPng metric. For example, a RIPng route with a metric of 5 learned from a neighbor configured with a metric-in value of 2 is advertised with a combined metric of 7 when advertised to RIPng neighbors in the same group. However, if this route was learned from a RIPng neighbor in a different group or from a different protocol, the route is advertised with the metric value configured for that group with the metric-out statement. The default value for metric-out is 1.

To modify the metric for routes advertised outside a group, include the metric-out statement at the [edit protocols ripng group *group-name*] hierarchy level:

```
[edit protocols ripng group group-name]  
metric-out metric;
```

Trace RIPng Protocol Traffic

To trace RIPng protocol traffic, you can specify options in the global traceoptions statement at the [edit routing-options] hierarchy level, and you can specify RIPng-specific options by including the traceoptions statement at the [edit protocols ripng] hierarchy level:

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

You can specify the following RIPng-specific options in the RIPng traceoptions statement:

- all—Trace everything.
- error—Trace RIPng errors.
- expiration—Trace RIPng route expiration processing.
- general—Trace general events.
- holddown—Trace RIPng hold-down processing.
- normal—Trace normal events.
- packets—Trace all RIPng packets.
- policy—Trace policy processing.
- request—Trace RIPng information packets.
- route—Trace routing information
- state—Trace state transitions.
- task—Trace routing protocol task processing.
- timer—Trace routing protocol timer processing.
- trigger—Trace RIPng triggered updates.
- update—Trace RIPng update packets.

Example: Configure RIPng

Configure RIPng:

```
[edit policy-options]
policy-statement redist-direct {
  from protocol direct;
  then accept;
}
[edit protocols ripng]
metric-in 3;
group wan {
  metric-out 2;
  export redist-direct;
  neighbor so-0/0/0.0;
  neighbor at-1/1/0.0;
  neighbor at-1/1/0.42;
  neighbor at-1/1/1.42 {
    receive version-2;
  }
}
group local {
  neighbor ge-2/3/0.0 {
    metric-in 1;
    send broadcast;
  }
}
```

RIPng CLI Commands

From the command-line interface (CLI), you can run `show` and `clear` commands to display RIPng information. The output contains statistics about sent and received messages on that interface, as well as information received from advertisements from other routers.

show route protocol ripng table inet6

Syntax show route protocol ripng table inet6

Description Display the entries in the RIPng routing tables.

Required Privilege Level view

Output Fields None.

Sample Output user@host> **show route protocol ripng table inet6**

```
inet6.0: 4215 destinations, 4215 routes (4214 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both
```

```
1111::1/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::2/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::3/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::4/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::5/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
1111::6/128      *[RIPng/100] 02:13:33, metric 2
                 > to fe80::2a0:a5ff:fe3d:56 via t3-0/2/0.0
```

show ripng statistics

Syntax	show ripng statistics
Description	Display RIPng statistics.
Required Privilege Level	view
See Also	clear ipv6 router-advertisement on page 193
Output Fields	<p>Updates Sent—Number of update messages sent.</p> <p>Triggered Updates Sent—Number of triggered update messages sent.</p> <p>Responses Sent—Number of response messages sent.</p> <p>Bad Messages—Number of bad messages received.</p> <p>Updates Received—Number of RIPng update messages received.</p> <p>Bad Route Entries—Number of RIPng bad route entry messages received.</p> <p>Updates Ignored—Number of RIPng update messages ignored.</p> <p>RIPng Requests Received—Number of RIPng request messages received.</p> <p>RIPng Requests Ignored—Number of RIPng request messages ignored.</p>

Sample Output

```

user@host> show ripng statistics
RIPng info:  port 521; update interval 30s; holddown 180s; timeout 120s.
      rts learned  rts held down  rqsts dropped  resps dropped
              4110             8             0           1646289

so-1/3/0.99:  0 routes learned; 4110 routes advertised
Counter                Total    Last 5 min  Last minute
-----                -
Updates Sent            28370         840         168
Triggered Updates Sent    42             1             0
Responses Sent           0              0             0
Bad Messages             0              0             0
Updates Received         3544          30             4
Bad Route Entries        0              0             0
Updates Ignored          0              0             0
RIPng Requests Received  0              0             0
RIPng Requests Ignored  0              0             0

```

