

Chapter 27

Routing Information Protocol, next generation (RIPng)

27.1 RIPng Overview

Routing Information Protocol, next generation (RIPng) is an implementation of a distance-vector, or Bellman-Ford, routing protocol for local networks. RIPng is based off the RIP protocol and inherits the limitations and constraints that are in RIP.

A router running RIPng sends an update to its neighbor routers every 30 seconds. Each update contains paired values, where each pair consists of an IPv6 network address and an integer distance to that network. RIPng uses a hop count metric to measure the distance to a destination. In the RIPng metric, a router advertises directly connected networks at a metric of 1 by default. Networks that are reachable through one other gateway are 2 hops, and so on. Thus, the number of hops or hop count along a path from a given source to a given destination refers to the number of gateways that a datagram would encounter along that path. Using hop counts to calculate shortest paths does not always produce optimal results. For example, a path with a hop count 3 that crosses three Ethernets may be substantially faster than a path with a hop count 2 that crosses two slow-speed serial lines. To compensate for differences in technology, many routers advertise artificially high hop counts for slow links.

At startup, RIPng issues a request for routing information and then listens for responses to the request. If a system configured to supply RIPng hears the request, it responds with a response packet based on information in its routing database. The response packet contains destination network addresses and the routing metric for each destination.

When a RIPng response packet is received, the routing daemon takes the information and rebuilds the routing database, adding new routes and "better" (lower metric) routes to destinations already listed in the database. RIPng also deletes routes from the database if the next router to that destination reports that the route contains more than 15 hops, or if the route is deleted. All routes through a gateway are deleted if no updates are received from that gateway for a specified time period. In general, routing updates are issued every 30 seconds. In many implementations, if a gateway is not heard from for 180 seconds, all routes from that gateway are deleted from the routing database. This 180-second interval also applies to deletion of specific routes.

27.2 RIPng Syntax

```
ripng ( on | off ) [ {  
    preference ripngpreference ;  
    defaultmetric metric ;  
    expire-time expire_time ;
```

```
    update-time update_time ;
    interface interface_list
        [ noripin ] | [ ripin ]
        [ noripout ] | [ ripout ]
        [ metricin ripngmetric ] | [ metricout ripngmetric ];
    traceoptions trace_options ;
} 1 ;
```

For more detailed information on these commands, see “Chapter 23 Routing Information Protocol, next generation (RIPng)” on page 551 of the *Command Reference Guide*.

27.3 RIPng Defaults

```
ripng on [ {
    preference 100 ;
    defaultmetric 1 ;
    update-time 30 ;
    expire-time 180 ;
    interface interface_list ripin ripout metricin ripngmetric metricout
        0 ;
    traceoptions trace_options ;
} 1 ;
```

27.4 RIPng Sample Configurations

27.4.1 RIPng on All Interfaces

The following configuration turns on RIPng on all interfaces with default settings.

```
ripng yes ;
```

27.4.2 RIPng on Two Interfaces

The following configuration turns on RIPng on two specific interfaces only.

```
ripng yes {
    interface eth0 ripin ripout ;
    interface eth1 ripin ripout ;
} ;
```