

Chapter 20

RIPng Overview

The Routing Information Protocol next generation (RIPng) is an interior gateway protocol (IGP) that uses a distance-vector algorithm to determine the best route to a destination, using the hop count as the metric. RIPng is a routing protocol that exchanges routing information used to compute routes and is intended for Internet Protocol version 6 (IPv6)-based networks.

This chapter discusses the following topics that provide background information about RIPng:

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RIPng Protocol Overview

The RIPng IGP uses the Bellman-Ford *distance-vector* algorithm to determine the best route to a destination. RIPng uses the hop count as the metric. RIPng allows hosts and routers to exchange information for computing routes through an IP-based network. RIPng is intended to act as an IGP for moderately-sized autonomous systems (ASs).

The JUNOS software implementation of RIPng is similar to RIPv2. However, RIPng is a distinct routing protocol from RIPv2 and has the following differences:

RIPng does not need to implement authentication on packets.

There is no support for multiple instances of RIPng.

There is no support for RIPng routing table groups.

RIPng is a User Datagram Protocol (UDP)-based protocol and uses UDP port 521.

RIPng has the following architectural limitations:

The longest network path cannot exceed 15 hops (assuming that each network, or hop, has a cost of 1).

RIPng depends on counting to infinity to resolve certain unusual situations. When the network consists of several hundred routers, and when a routing loop has formed, the amount of time and network bandwidth required to resolve a next hop might be great.

RIPng uses only a fixed metric to select a route. Other IGPs use additional parameters, such as measured delay, reliability, and load.

RIPng Standards

RIPng is defined in the following documents:

RFC 2080, *RIPng for IPv6*

RFC 2081, *RIPng Protocol Applicability Statement*

To access Internet Requests for Comments (RFCs) and drafts, go to the Internet Engineering Task Force (IETF) Web site at <http://www.ietf.org>.

RIPng Packets

A RIPng packet header contains the following fields:

Command—Indicates whether the packet is a request or response message. Request messages seek information for the router's routing table. Response messages are sent periodically or when a request message is received. Periodic response messages are called *update messages*. Update messages contain the command and version fields and a set of destinations and metrics.

Version number—Specifies the version of RIPng that the originating router is running. This is currently set to Version 1.

The rest of the RIPng packet contains a list of routing table entries that contain the following fields:

Destination prefix—128-bit IPv6 address prefix for the destination.

Prefix length—Number of significant bits in the prefix.

Metric—Value of the metric advertised for the address.

Route tag—A route attribute that must be advertised and redistributed with the route. Primarily, the route tag distinguishes external RIPng routes from internal RIPng routes in cases where routes must be redistributed across an exterior gateway protocol (EGP).