

Chapter 23

ICMP Router Discovery Overview

Router discovery uses Internet Control Message Protocol (ICMP) router advertisements and router solicitation messages to allow a host to discover the addresses of operational routers on the subnet. Hosts must discover routers before they can send IP datagrams outside their subnet.

Router discovery allows a host to discover the addresses of operational routers on the subnet. The JUNOS software implementation of router discovery supports server mode only.

Each router periodically multicasts a router advertisement from each of its multicast interfaces, announcing the IP address of that interface. Hosts listen for advertisements to discover the addresses of their neighboring routers. When a host starts, it can send a multicast router solicitation to ask for immediate advertisements.

The router discovery messages do not constitute a routing protocol. They enable hosts to discover the existence of neighboring routers, but do not determine which router is best to reach a particular destination.

This chapter discusses the following topics that provide background information about ICMP router discovery:

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ICMP Router Discovery Standards

Router discovery is defined in RFC 1256, *ICMP Router Discovery Messages*.

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

Operation of a Router Discovery Server

The router discovery server distributes information about the addresses of all routers on directly connected networks and about their preferences for becoming the default router. (A host sends a packet to the default router if the host does not have a route to a destination in its routing table.) The server does this by periodically sending router advertisement packets out each interface on which router discovery is enabled. In addition to containing the router addresses, these packets also announce the existence of the server itself.

The server can either transmit broadcast or multicast router advertisement packets. Multicast packets are sent to 224.0.0.1, which is the all-hosts multicast address. When packets are sent to the all-hosts multicast address, or when an interface is configured for the limited-broadcast address 255.255.255.255, all IP addresses configured on the physical interface are included in the router advertisement. When the packets are being sent to a network or subnet broadcast address, only the address associated with that network or subnet is included in the router advertisement.

When the routing protocol process first starts on the server router, the server sends router advertisement packets every few seconds. Then, the server sends these packets less frequently, commonly every 10 minutes.

The server responds to route solicitation packets it receives from a client. The response is sent unicast unless a router advertisement packet is due to be sent out momentarily.

Router Advertisement Messages

Router advertisement messages include a preference level and a lifetime field for each advertised router address.

The preference level specifies the router's preference to become the default router. When a host chooses a default router address, it chooses the address with the highest preference. You can configure the preference level with the `priority` statement.

The lifetime field indicates the maximum length of time that the advertised addresses are to be considered valid by hosts in the absence of further advertisements. You can configure the advertising rate with the `max-advertisement-interval` and `min-advertisement-interval` statements, and you can configure the lifetime with the `lifetime` statement.