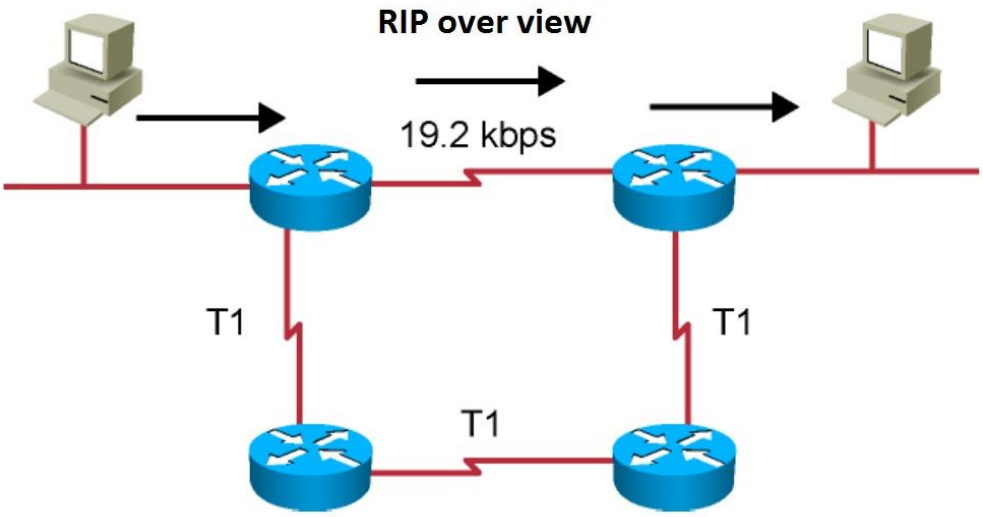
RIP
(Routing Information Protocol)



RIP (Routing Information Protocol) RIP is a standardized Distance Vector protocol, designed for use on smaller networks.

RIP was one of the first true Distance Vector routing protocols, and is supported on a wide variety of systems.

RIP adheres to the following Distance Vector characteristics:

• RIP sends out periodic routing updates (every 30 seconds)

• RIP sends out the full routing table every periodic update

• RIP uses a form of distance as its metric (in this case, hopcount)

• RIP uses the **Bellman-Ford Distance Vector** algorithm to determine the best "path" to a particular destination

Other characteristics of RIP include:

• RIP supports IP and IPX routing.

• RIP utilizes UDP port 520

• RIP routes have an administrative distance of 120.

• RIP has a maximum hopcount of 15 hops. Any network that is 16 hops away or more is considered unreachable to RIP, thus the maximum diameter of the network is 15 hops.

A metric of 16 hops in RIP is considered a poison route or infinity metric. If multiple paths exist to a particular destination, RIP will load balance between those paths (by default, up to 4) only if the metric (hopcount) is equal.

RIP Versions

RIP has two versions, Version 1 (RIPv1) and Version 2 (RIPv2).

RIPv1 (RFC 1058) is classful, and thus does not include the subnet mask with its routing table updates. Because of this, RIPv1 does not support Variable Length Subnet Masks (VLSMs).

When using RIPv1, networks must be contiguous, and subnets of a major network must be configured with identical subnet masks.

Otherwise, route table inconsistencies (or worse) will occur. RIPv1 sends updates as broadcasts to address 255.255.255.255.

RIPv2 (RFC 2543) is classless, and thus does include the subnet mask with its routing table updates.

RIPv2 fully supports VLSMs, allowing discontiguous networks and varying subnet masks to exist.

Other enhancements offered by RIPv2 include:

• Routing updates are sent via multicast, using address 224.0.0.9

• Encrypted authentication can be configured between RIPv2 routers

• Route tagging is supported (explained in a later section) RIPv2 can interoperate with

RIPv1. By default:

• RIPv1 routers will sent only Version 1 packets

• RIPv1 routers will receive both Version 1 and 2 updates

• RIPv2 routers will both send and receive only Version 2 updates

We can control the version of RIP a particular interface will “send” or “receive.”

Unless RIPv2 is manually specified, a Cisco will default to RIPv1 when configuring RIP.

RIP Loop Avoidance Mechanisms

Split-Horizon – Prevents a routing update from being sent out the interface it was received on. And is enabled by default on Cisco Routers.

Route-Poisoning – Works in conjunction with split-horizon, by triggering an automatic update for the failed network, without waiting for the update timer to expire. This update is sent out all interfaces with an infinity metric for that network.

Hold-Down Timers – Prevents RIP from accepting any new updates for routes in a hold-down state, until the hold-down timer expires.

RFCs

A Request for Comments (RFC) is a formal document from the Internet Engineering Task Force (IETF) that is the result of committee drafting and subsequent review by interested parties. Some RFCs are informational in nature. Of those that are intended to become Internet standards, the final version of the RFC becomes the standard and no further comments or changes are permitted. Change can occur, however, through subsequent RFCs that supersede or elaborate on all or parts of previous RFCs.

Related RIP RFCs

Number	Authors	Date	More info	Status
1058	C. Hedrick	June 1988	Updated by: 1388,1723	Historic
1388	G. Malkin	January 1993	Updates: RFC 1058	PROPOSED STANDARD
1723	G. Malkin	November 1994	Updates: RFC 1058	INTERNET STANDARD (changed from DRAFT STANDARD November 1998)
2453	G. Malkin	November 1998	Obsoletes: 1723, 1388	Standards Track
2080	G. Malkin, R. Minnear	January 1997		Proposed Standard

RFC 1058

Status of this Memo

This RFC describes an existing protocol for exchanging routing information among gateways and other hosts. It is intended to be used as a basis for developing gateway software for use in the Internet community. Distribution of this memo is unlimited.

This memo describes one protocol in a series of routing protocols based on the Bellman-Ford (or distance vector) algorithm. This algorithm has been used for routing computations in computer networks since the early days of the ARPANET. The particular packet formats and protocol described here are based on the program "routed", which is included with the Berkeley distribution of Unix. It has become a de facto standard for exchange of routing information among gateways and hosts. It is implemented for this purpose by most commercial vendors of IP gateways. Note, however, that many of these vendors have their own protocols which are used among their own gateways.

This protocol is most useful as an "interior gateway protocol". In a nationwide network such as the current Internet, it is very unlikely that a single routing protocol will used for the whole network.

RFC 1388

Status of this Memo

This RFC specifies an IAB standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This document specifies an extension of the Routing Information Protocol (RIP), as defined in, to expand the amount of useful information carried in RIP packets and to add a measure of security. A companion document will define the SNMP MIB objects for RIP-2.

RFC 1723

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This document specifies an extension of the Routing Information Protocol (RIP), to expand the amount of useful information carried in RIP messages and to add a measure of security. This memo obsoletes RFC 1388, which specifies an update to the "Routing Information Protocol" STD 34, RFC 1058. The RIP-2 protocol analysis is documented in RFC 1721. The RIP-2 applicability statement is document in RFC 1722. The RIP-2 MIB description is defined in RFC 1724. This memo obsoletes RFC 1389.

RFC 2453

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This document specifies an extension of the Routing Information Protocol (RIP), to expand the amount of useful information carried in RIP messages and to add a measure of security.

A companion document will define the SNMP MIB objects for RIP-2. An additional document will define cryptographic security improvements for RIP-2.

RFC 2080

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This document specifies a routing protocol for an IPv6 internet. It is based on protocols and algorithms currently in wide use in the IPv4 Internet. This specification represents the minimum change to the Routing Information Protocol (RIP), as specified in RFC 1058 and RFC 1723, necessary for operation over IPv6.