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Internet Draft   Xylogics
                                                        August 1992

                 RIP Version 2 Protocol Analysis

Abstract

   As required by Routing Protocol Criteria (RFC 1264), this report
   documents the key features of the RIP-2 protocol and the current
   implementation experience. This report is a prerequisite to entering
   RIP-2 into the standards track.

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   consideration as a standards document. Distribution of this document
   is unlimited.

1. Protocol Documents

The RIP-2 protocol description is defined in Internet Draft "draft-ietf-malkin-rip-04.txt". This draft specifies an update to the "Routing Information Protocol" RFC 1058.

The RIP-2 MIB description is defined in Internet Draft "draft-ietf-ripv2-mibext-02.txt". This draft has been approved by the Network Management Area Directorate, and has passed two independent MIB compiler checks.

2. Key Features

While RIP-2 shares the same basic algorythms as RIP-1, it supports several new features. They are: routing domains, external route tags, subnet masks, next hop addresses, and authentication.

2.1 Routing Domains

Routing domains allow multiple RIP "clouds" to exist over the same physical network. This is a feature requested by several members of the working group. It allows simple policies to be constructed by grouping routers into domains which share routing information.

2.2 External Route Tags

The route tag field may be used to propagate information acquired from an EGP. The definition of the contents of this field are beyond the scope of this protocol. However, it may be used, for example, to propagate an EGP AS number.

2.3 Subnet Masks

Inclusion of subnet masks was the original intent of opening the RIP protocol for improvement. Subnet mask information makes RIP more useful in a variety of environments and allows the use of variable subnet masks on the network. Subnet masks are also necessary for implementation of "classless" addressing, as the CIDR work proposes.

2.4 Next Hop Addresses

Support for next hop addresses allows for optimization of routes in an environment which uses multiple routing protocols. For example,

   if RIP-2 were being run on a network along with another IGP, and one
   router ran both protocols, then that router could indicate to the
   other RIP-2 routers that a better next hop than itself exists for a
   given destination.

[2.5](#) Authentication

   One significant improvement RIP-2 offers over RIP-1, is the addition
   of an authentication mechanism. Essentially, it is the same
   extensible mechanism provided by OSPF. Currently, only a plain-text
   password is defined for authentication. However, more sophisticated
   authentication schemes can easily be incorporated as they are
   defined.

[2.6](#) Multicasting

   RIP-2 packets may be multicast instead of being broadcast. The use
   of an IP multicast address reduces the load on hosts which do not
   support routing protocols. It also allows RIP-2 routers to share
   information which RIP-1 routers cannot hear. This is useful since a
   RIP-1 router may missinterpret route information because it cannot
   apply the supplied subnet mask.

[3](#). RIP-2 MIB

   The MIB for RIP-2 allows for monitoring and control of RIP's
   operation within the router. In addition to global and per-interface
   counters and controls, there is are per-peer counters which provide
   the status of RIP-2 "neighbors".

[4](#). Implementations

   Currently, there is one nearly complete implementation of RIP-2. A
   "gated" implementation is now available with RIP-2, written by
   Jeffrey Honig at Cornell University. It may be acquired by anonymous
   FTP from gated.cornell.edu as pub/gated/gated-alpha.tar.Z. It
   implements multicasting, subnet masks, limited authentication, next-
   hop, and limited routing domain support. A RIP-2 version of ripquery
   is also available. The "gated" implementation does not yet support
   full subsumption rules, full authentication, full routing domains,
   and the MIB. It has been tested against itself and various RIP-1
   implementations.

   A second, complete implementation is under development by a vendor

who's identity cannot be disclosed at this time.

[5](#). Security

Security issues are discussed in [section 2.5](#).

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