              RIPv1 Applicability Statement for Historic Status

Status of this Memo

Abstract

   RIP Version 1 [RFC-1058] has been declared an historic document.
   This Applicability statement provides the supporting motivation for
   that declaration. The primary reason, as described below, is the
   Classful nature of RIPv1.

1.0 Introduction

   RIP version 1 (RIPv1) (as defined by RFC 1058) was one of the first
   dynamic routing protocols used in the internet. It was developed as
   a technique for passing around network reachability information for
   what we now consider relatively simple topologies.

   The Internet has changed significantly since RIPv1 was defined,
   particularly with the introduction and use of subnets and CIDR.

   While RIPv1 is widely used in private networks, it can no longer be
   considered applicable for use in the global Internet.

2.0 RIPv1 restrictions

   RIPv1 has a number of restrictions and behaviors which restrict its
   useability in the global Internet.

2.1 Classfulness

   Chief among these is that it is a classful routing protocol. RIP
   packets do not carry prefix masks. The prefix length is inferred
   from the address. For non-local addresses, the prefix is always the
   "natural" (classful) length. (e.g., 24 bits for a "Class C" network
   address.) For networks to which a local interface exists, if the
   interface is subnetted with some specific mask, then RIPv1 assumes

that the mask used locally is the correct mask to apply for all
subnets of that network.

This has a number of effects.

1) RIPv1 can not be used with variable length subnetting. In the
   presence of variable length subnetting it will consistently
   misinterpret prefix lengths.

2) RIPv1 is difficult to use with supernetting. All CIDR supernets
   must be exploded and advertised to RIPv1 as individual "natural"
   classful advertisements.

3) Even when the networks running RIPv1 are themselves only subnetted
   in fixed ways, if the remainder of the network has variable
   subnetting then one must carefully make sure that RIPv1 does not
   destroy the mask information when it passes through those subnets
   running RIPv1. Put another way, co-existence with mutual
   information exchange between RIPv1 and more advanced routing
   protocols is problematic at best. Note that this applies even when
   the other routing protocol is RIPv2.

4) The Internet will soon be making use of addresses which appear to
   RIPv1 to be parts of Class A networks. Networks using RIPv1 may not
   be able to reach all sites assigned the subsections of a single A.

2.2 Simple Distance Vector

RIPv1 is a simple distance vector protocol. It has been enhanced
with various techniques, including Split Horizon and Poison Reverse
in order to enable it to perform better in somewhat complicated
networks.

However, being a simple distance vector protocol, it will run into
difficulty. First and foremost, it will occasionally have to count to
infinity in order to purge bad routes. This delays the convergence
of routing. In order to keep this short, RIPv1 defines infinity as
16 hops. That means that networks with diameters larger than that
can not use RIP. Even getting close to that limit can cause
confusion for some implementations.

3.0 Conclusion

The recommendation of this Applicability statement is that if there
is reason to run RIP in a network environment, one should use RIPv2
(RFC 1723).

RIPv1 itself should only be used in simple topologies, with simple
reachability. It may be used by any site which uses fixed subnetting
internally, and either uses a default route to deal with external
traffic or is not connected to the global Internet or to other
organizations.

RIPv1 may also be used as a local advertising technology if the
information to be used fits within its capabilities.

4.0 Security Considerations

RIPv1 includes no security functions. RIPv2 includes a mechanism for
authenticating the sender of the routing information. Sites which
are worried about the vulnerability of their routing infrastructure
and which feel they must run a RIP-like protocol should use RIPv2.

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