Solutions	Products	Ordering	Support	Partners	Training	Corporate

Tech Notes

Why Don't RIPv1 and IGRP Support Variable-Length Subnet Mask?

Contents

Help us help you.

☐
Please rate this document.
◯ Excellent
◯ Good
◯ Average
◯ Fair
◯ Poor

☐
This document solved my problem.
◯ Yes
◯ No
◯ Just browsing

☐
Suggestions for improvement:

(256 character limit)

[Send]

Introduction

The ability to specify a different subnet mask for the same network number on different subnets is called Variable-Length Subnet Mask (VLSM). RIPv1 and IGRP are classful protocols and are incapable of carrying subnet mask information in their updates. Before RIPv1 or IGRP sends out an update, it performs a check against the subnet mask of the network that is about to be advertised and, in case of VLSM, the subnet gets dropped.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Example

This section provides an example. In this figure, Router 1 has three subnets with two different masks (/24 and /30):

Router 1 goes through these steps before sending an update to Router 2. Refer to Behavior of RIP and IGRP When Sending or Receiving Updates for more information on these steps.

1. Router 1 checks to see whether 131.108.5.0/24 is part of the same major net as 131.108.6.0/30, which is the network assigned to the interface that will be sourcing the update.

2. It is, and now Router 1 checks whether 131.108.5.0 has the same subnet mask as 131.108.6.0/30.

3. Because it does not, Router 1 drops the network, and does not advertise the route.

4. Router 1 now checks whether 131.108.7.0/30 is part of the same major net as 131.108.6.0/30, which is the network assigned to the interface that will be sourcing the update.

5. It is, and now Router 1 checks whether 131.108.7.0/30 has the same subnet mask as 131.108.6.0/30.

6. Because it does, Router 1 advertises the network.

These checks determined that Router 1 only includes 131.108.7.0 in its update that is sent to Router 2. When the **debug ip rip** command is issued, you can actually see the update sent by Router 1. This is how it looks:

```
RIP: sending v1 update to 255.255.255.255 via Serial0 (131.108.6.2)
subnet 131.108.7.0, metric 1
```

Notice that in the previous output only one subnet is included in the update. This results in this entry in Router 2's routing table, which is displayed using the **show ip route** command:

```
131.108.0.0/30 is subnetted, 3 subnets
R       131.108.7.0 [120/1] via 131.108.6.2, 00:00:08, Serial0
C       131.108.6.0 is directly connected, Serial0
C       131.108.2.0 is directly connected, Ethernet0
```

In order to avoid having subnets eliminated from routing updates, either use the same subnet mask over the entire RIPv1 network or use static routes for networks with different subnet masks.

NetPro Discussion Forums - Featured Conversations

Networking Professionals Connection is a forum for networking professionals to share questions, suggestions, and information about networking solutions, products, and technologies. The featured links are some of the most recent conversations available in this technology.

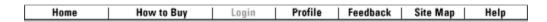| NetPro Discussion Forums - Featured Conversations for RP |
| --- |
| Service Providers: MPLS |
| Mpls vpn routing problem! - Nov 23, 2007
How to implement redundant with 1 CE router to 2 MPLS service providers - Nov 23, 2007
IP VPN MPLS design requirements - Nov 22, 2007
VPLS and H-VPLS - Nov 21, 2007
Frame Relay access into MPLS with QOS - Nov 21, 2007 |
| Virtual Private Networks: Services |
| VPN install with PCF file imbedded - Nov 19, 2007
ASA 8.0 VPN cluster with WEBVPN and Certificates - Nov 18, 2007
IP phone with Cisco VPN client - Nov 14, 2007
VPN Design Query - Nov 13, 2007
Using Outlook mail with VPN Remote desktop - Nov 12, 2007 |
| Virtual Private Networks: Security |
| VPN client cannot access to ASA inside interface after upgrade to 8.x - Nov 23, 2007
ASA 8.0 hangs on while URL filtering is on - Nov 23, 2007
EzVPN Server & 1721 - Nov 22, 2007
SENSOR INTERFACE OF IDS 4235 NOT COMING UP? - Nov 22, 2007
ASA Active/Standby failed due to licensing issue. - Nov 22, 2007 |

Related Information

- **IP Routing Protocols Support Pages**
- **Technical Support & Documentation - Cisco Systems**

Home	How to Buy	Login	Profile	Feedback	Site Map	Help