IP Multicast

# Why Doesn't PIM Sparse Mode Work with a Static Route to an HSRP Address?

HOME
SUPPORT
TECHNOLOGY SUPPORT
IP
IP MULTICAST
TROUBLESHOOT AND ALERTS
TROUBLESHOOTING TECHNOTES
**Why Doesn't PIM Sparse Mode Work with a Static Route to an HSRP Address?**

## Contents



**Document ID**: 13783
**Updated**: Aug 10, 2005

Download PDF Print
Feedback

**Related Products**
IP Multicast

## Introduction

This document explains why multicast packets are not forwarded when you configure a static route to the Hot Standby Router Protocol (HSRP) address of a Protocol Independent Multicast (PIM) sparse mode neighbor.

## Prerequisites

### Requirements

Readers of this document should have knowledge of these topics:

- HSRP
- PIM sparse mode

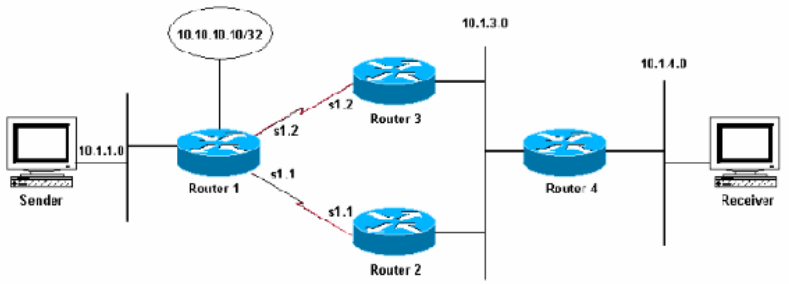
### Components Used

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

### Conventions

For more information on document conventions, refer to Cisco Technical Tips Conventions.

## Network Diagram




In the figure above, Routers 2 and 3 are talking HSRP on subnet 10.1.3.0, and Router 2 is the active router. Routers 1, 2, and 3 are talking Enhanced Interior Gateway Routing Protocol (EIGRP), and Router 4 has a static default route to the HSRP virtual address.

### Configurations

| Router 1 | Router 2 |
|---|---|
| Current configuration:<br><br>!<br>ip multicast-routing<br>!<br>!<br>interface Loopback0<br>ip address 10.10.10.10 255.255.255.255<br>no ip directed-broadcast<br>!<br>interface Ethernet0<br>no ip address<br>no ip directed-broadcast<br>shutdown<br>!<br>interface Ethernet1<br>ip address 10.1.1.1 255.255.255.0<br>no ip directed-broadcast<br>ip pim sparse-mode<br>!<br>interface Serial1<br>no ip address<br>no ip directed-broadcast<br>encapsulation frame-relay<br>!<br>interface Serial1.1 point-to-point<br>ip address 10.1.2.1 255.255.255.252 | Current configuration:<br><br>!<br>ip multicast-routing<br>ip dvmrp route-limit 20000<br>!<br>!<br>interface Ethernet1<br>ip address 10.1.3.1 255.255.255.0<br>no ip redirects<br>ip pim sparse-mode<br>standby 1 priority 110 preempt<br>standby 1 ip 10.1.3.3<br>!<br>interface Serial1<br>no ip address<br>encapsulation frame-relay<br>!<br>interface Serial1.1 point-to-point |

```
no ip directed-broadcast
ip pim sparse-mode
frame-relay interface-dlci 612
!
!
interface Serial1.2 point-to-point
ip address 10.1.2.5 255.255.255.252
no ip directed-broadcast
ip pim sparse-mode
frame-relay interface-dlci 613
!
router eigrp 1
network 10.0.0.0
no auto-summary
!
ip classless
no ip http server
ip pim rp-address 10.10.10.10
!

end
```

```
ip address 10.1.2.2 255.255.255.252
ip pim sparse-mode
frame-relay interface-dlci 621
!
router eigrp 1
network 10.0.0.0
no auto-summary
!
ip classless
ip pim rp-address 10.10.10.10
!

end
```

**Router 3**

```
Current configuration:

!
ip multicast-routing
ip dvmrp route-limit 20000
!
interface Ethernet1
ip address 10.1.3.2 255.255.255.0
no ip redirects
ip pim sparse-mode
standby 1 priority 100 preempt
standby 1 ip 10.1.3.3
!
interface Serial1
no ip address
encapsulation frame-relay
!
interface Serial1.2 point-to-point
ip address 10.1.2.6 255.255.255.252
ip pim sparse-mode
frame-relay interface-dlci 631
!
router eigrp 1
network 10.0.0.0
no auto-summary
eigrp log-neighbor-changes
!
ip classless
no ip http server
ip pim rp-address 10.10.10.10
!

end
```

**Router 4**

```
Current configuration:

ip multicast-routing
ip dvmrp route-limit 20000
!
!
!
interface Ethernet0
ip address 10.1.4.1 255.255.255.0
no ip directed-broadcast
ip igmp join-group 239.1.2.3
!
interface Ethernet1
ip address 10.1.3.4 255.255.255.0
no ip directed-broadcast
ip pim sparse-mode
!
no ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.1.3.3
ip pim rp-address 10.10.10.10
!

end
```

In order to simulate a host on Ethernet 0, the **ip igmp join-group** command was configured on this interface on Router 4:

```
router4# ip igmp join-group

IGMP Connected Group Membership
Group Address Interface Uptime Expires Last Reporter
224.0.1.40 Ethernet1 4d23h never 10.1.3.1
239.1.2.3 Ethernet0 4d23h never 10.1.4.1
```

Router 4 also can ping the rendezvous point (RP) address:

```
Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/61/68 ms
```

Look at the multicast route (mroute) table:

```
Router4# show ip mroute 239.1.2.3

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, C - Connected, L - Local, P - Pruned
R - RP-bit set, F - Register flag, T - SPT-bit set, J - Join SPT
X - Proxy Join Timer Running

Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode
(*, 239.1.2.3), 00:04:28/00:00:00, RP 10.10.10.10, flags: SJCL
Incoming interface: Ethernet1, RPF nbr 10.1.3.3
Outgoing interface list:
Ethernet0, Forward/Sparse, 00:02:12/00:02:53
```

Because there is a receiver for this group (due to the **ip igmp join-group** command used in Router 4), build a (*,G) entry in the mroute table. Note the Reverse Path Forwarding (RPF) neighbor for the (*,G) entry is 10.1.3.3, which is the HSRP standby address. However, there is not a (S,G) entry, which means traffic is not being received from the source.

Since Router 4 has an interested receiver for the group, it now should send a PIM Join/Prune message to its PIM neighbors. Use the **show ip pim neighbor** command to view Router 4's PIM neighbors, as seen below:

```
Router4# show ip pim neighbor

PIM Neighbor Table
Neighbor Address Interface Uptime Expires Ver Mode
10.1.3.1 Ethernet1 4d23h 00:01:41 v2
10.1.3.2 Ethernet1 4d23h 00:01:36 v2
```

If the **debug ip pim 239.1.2.3** command is enabled, Router 4 is building this PIM Join/Prune message, but it does not actually send it:

*Mar 6 18:32:48: PIM: Received RP-Reachable on Ethernet1 from 10.10.10.10 *Mar 6 18:32:48: for group 239.1.2.3 *Mar 6 18:33:14: PIM: Building Join/Prune message for 239.1.2.3 *Mar 6 18:34:13: PIM: Building Join/Prune message for 239.1.2.3

Why is the router not sending the Join/Prune message? RFC 2362 states that "a router sends a periodic Join/Prune message to each distinct RPF neighbor associated with each (S,G), (*,G) and (*,*,RP) entry. Join/Prune messages are sent only if the RPF neighbor is a PIM neighbor."

In the example, the RPF neighbor is 10.1.3.3, which is the HSRP standby address used by the default static route. However, this address is not listed as a PIM neighbor. The reason the HSRP standby address is not listed as a PIM neighbor is because the two routers running HSRP (Routers 2 and 3) will not source the PIM neighbor messages from the HSRP standby address.

To solve the problem, change Router 4's configuration so the RPF neighbor is also a PIM neighbor. Do this by including Router 4 in the EIGRP process so that it now learns the RP address through EIGRP.

**Note:** Since Router 4 has the capability to run a routing protocol it should not have to rely on an HSRP standby address for connectivity. The development of HSRP was intended to offer a way for hosts to gain quick and efficient redundancy or fail-over.

Below is the new configuration of Router 4 with EIGRP enabled.

```
ip multicast-routing
ip dvmrp route-limit 20000
!
!
!
interface Ethernet0
ip address 10.1.4.1 255.255.255.0
no ip directed-broadcast
ip igmp join-group 239.1.2.3
!
interface Ethernet1
ip address 10.1.3.4 255.255.255.0
no ip directed-broadcast
ip pim sparse-mode
!
router eigrp 1
network 10.0.0.0
no auto-summary
!
no ip http server
ip classless
ip route 0.0.0.0 0.0.0.0 10.1.3.3
ip pim rp-address 10.10.10.10
!
end
```

**Note:** Instead of including Router 4 in the EIGRP process (the preferred method), add static mroutes to Router 4 to make it RPF to the real routers' IP addresses because mroutes are preferred over the unicast routing table in RPF checks. For example, add **ip mroute 0.0.0.0 0.0.0.0 10.1.3.2**.

## Related Information

- **HSRP Support Page**
- **IP Routed Protocols Support Page**
- **Technical Support - Cisco Systems**



The Cisco Support Community is a forum for you to ask and answer questions, share suggestions, and collaborate with your peers.

Refer to Cisco Technical Tips Conventions for information on conventions used in this document.

Updated: Aug 10, 2005 Document ID: 13783