¿Por qué no funciona el modo disperso de PIM con una ruta estática hacia una dirección HSRP?

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Introducción

Este documento explica por qué los paquetes de multidifusión no se reenvían cuando se configura una ruta estática a la dirección Hot Standby Router Protocol (HSRP) de un vecino de modo disperso de Protocol Independent Multicast (PIM).

Prerequisites

Requirements

Quienes lean este documento deben tener conocimiento de los siguientes temas:

- HSRP
- Modo disperso de PIM

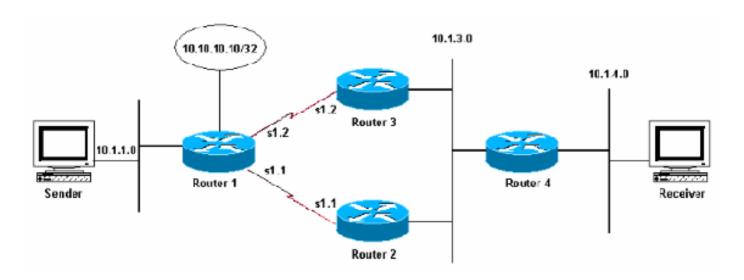
Componentes Utilizados

Este documento no tiene restricciones específicas en cuanto a versiones de software y de hardware.

Convenciones

Para obtener más información sobre las convenciones del documento, consulte <u>Convenciones de Consejos Técnicos de Cisco</u>.

Diagrama de la red



En la figura anterior, los Routers 2 y 3 hablan HSRP en la subred 10.1.3.0, y el Router 2 es el router activo. Los routers 1, 2 y 3 hablan del protocolo de routing de gateway interior mejorado (EIGRP) y el router 4 tiene una ruta estática predeterminada a la dirección virtual HSRP.

Configuraciones

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<pre>ip pim sparse-mode frame-relay interface-dlci 612 ! router eigrp 1 ! network 10.0.0.0 interface Serial1.2 point-to-point no auto-summary</pre>		
frame-relay interface-dlci 612 ! ! router eigrp 1 ! network 10.0.0.0 interface Serial1.2 point-to-point no auto-summary	no ip directed-broadcast	
! router eigrp 1 ! network 10.0.0.0 interface Serial1.2 point-to-point no auto-summary		interface-dlci 621
! network 10.0.0.0 interface Serial1.2 point-to-point no auto-summary	frame-relay interface-dlci 612	!
interface Serial1.2 point-to-point no auto-summary	!	
	!	network 10.0.0.0
		no auto-summary
p address 10.1.2.5	ip address 10.1.2.5	!

```
255.255.255.252
no ip directed-broadcast
ip pim sparse-mode
frame-relay interface-dlci 613
                                     ip classless
router eigrp 1
                                     ip pim rp-address
network 10.0.0.0
                                    10.10.10.10
no auto-summary
ip classless
                                     end
no ip http server
ip pim rp-address 10.10.10.10
end
                                     Router 4
Router 3
Current configuration:
                                     Current
                                     configuration:
ip multicast-routing
                                     ip multicast-routing
ip dvmrp route-limit 20000
                                     ip dvmrp route-limit
                                    20000
interface Ethernet1
ip address 10.1.3.2 255.255.255.0
no ip redirects
ip pim sparse-mode
                                     interface Ethernet0
standby 1 priority 100 preempt
                                     ip address 10.1.4.1
standby 1 ip 10.1.3.3
                                     255.255.255.0
                                    no ip directed-
interface Serial1
                                     broadcast
no ip address
                                     ip igmp join-group
encapsulation frame-relay
                                     239.1.2.3
interface Serial1.2 point-to-point
                                     interface Ethernet1
ip address 10.1.2.6
                                    ip address 10.1.3.4
255.255.255.252
                                     255.255.255.0
ip pim sparse-mode
                                     no ip directed-
frame-relay interface-dlci 631
                                     broadcast
                                     ip pim sparse-mode
router eigrp 1
network 10.0.0.0
                                    no ip http server
no auto-summary
                                    ip classless
eigrp log-neighbor-changes
                                     ip route 0.0.0.0
                                     0.0.0.0 10.1.3.3
ip classless
                                     ip pim rp-address
no ip http server
                                     10.10.10.10
ip pim rp-address 10.10.10.10
!
                                     end
end
```

Para simular un host en Ethernet 0, el comando **ip igmp Join-group** se configuró en esta interfaz en el 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
```

El router 4 también puede hacer ping a la dirección de punto de encuentro (RP):

```
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

Observe la tabla de ruta multicast (mroute):
```

```
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
```

Debido a que hay un receptor para este grupo (debido al comando **ip igmp Join-group** utilizado en el Router 4), genere una entrada (*,G) en la tabla mroute. Tenga en cuenta que el vecino de Reenvío por ruta inversa (RPF) para la entrada (*, G) es 10.1.3.3, que es la dirección de espera de HSRP. Sin embargo, no hay una entrada (S,G), lo que significa que el tráfico no se recibe del origen.

Dado que el Router 4 posee un receptor interesado para el grupo, ahora debería enviar un mensaje de adhesión/exclusión PIM a sus vecinos PIM. Usar el comando show ip pim neighbor para visualizar los routers 4's PIM vecinos, como se muestra a continuación:

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
```

Si el comando debug ip pim 239.1.2.3 está activado, el Router 4 genera este mensaje de adhesión/exclusión PIM, pero en realidad no lo envía:

*Mar 6 18:32:48: PIM: RP alcanzable recibido en Ethernet1 desde 10.10.10.10 *6 de mar 18:32:48: para el grupo 239.1.2.3 * 6 de marzo 18:33:14: PIM: Generar mensaje de unión/separación para 239.1.2.3 *6 de marzo 18:34:13: PIM: Generación de mensajes de adhesión/exclusión para 239.1.2.3

¿Por qué el router no envía el mensaje de incorporación/separación? RFC 2362 establece que "un router envía un mensaje de Unión/Separación periódico a cada vecino RPF distinto asociado con cada entrada (S,G), (*,G) y (*,*,RP). Los mensajes de unión/separación se envían solamente si el vecino RPF es un vecino PIM."

En el ejemplo, el vecino RPF es 10.1.3.3, dirección HSRP de reserva utilizada por la ruta estática predeterminada. No obstante, esta dirección no está detallada como un vecino PIM. La razón por la cual la dirección HSRP inactiva no está en la lista como un vecino PIM es que los dos routers que ejecutan HSRP (Routers 2 y 3) no cargarán los mensajes PIM vecinos desde la dirección HSRP inactiva.

Para resolver el problema, modifique la configuración del router 4 de manera que el RPF vecino sea también un vecino PIM. Realice esto incluyendo el router 4 en el proceso EIGRP para que ahora éste conozca la dirección RP a través de EIGRP.

Nota: Dado que el Router 4 tiene la capacidad de ejecutar un protocolo de ruteo, no debe depender de una dirección HSRP standby para la conectividad. El desarrollo de HSRP tenía por objeto ofrecer una manera para que los hosts obtengan una redundancia rápida y eficiente o conmutación por error.

La nueva configuración del Router 4 con EIGRP habilitado aparece a continuación.

```
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
```

Nota: En lugar de incluir el Router 4 en el proceso EIGRP (el método preferido), agregue rutas multicast estáticas al Router 4 para convertirlo en RPF a las direcciones IP de los routers reales porque las rutas multicast son preferidas sobre la tabla de ruteo unicast en las verificaciones RPF. Por ejemplo, agregue **ip mroute 0.0.0.0 0.0.0 10.1.3.2**.

Información Relacionada

- Página de Soporte de HSRP
- Página de Soporte de IP Routed Protocols
- Soporte Técnico Cisco Systems