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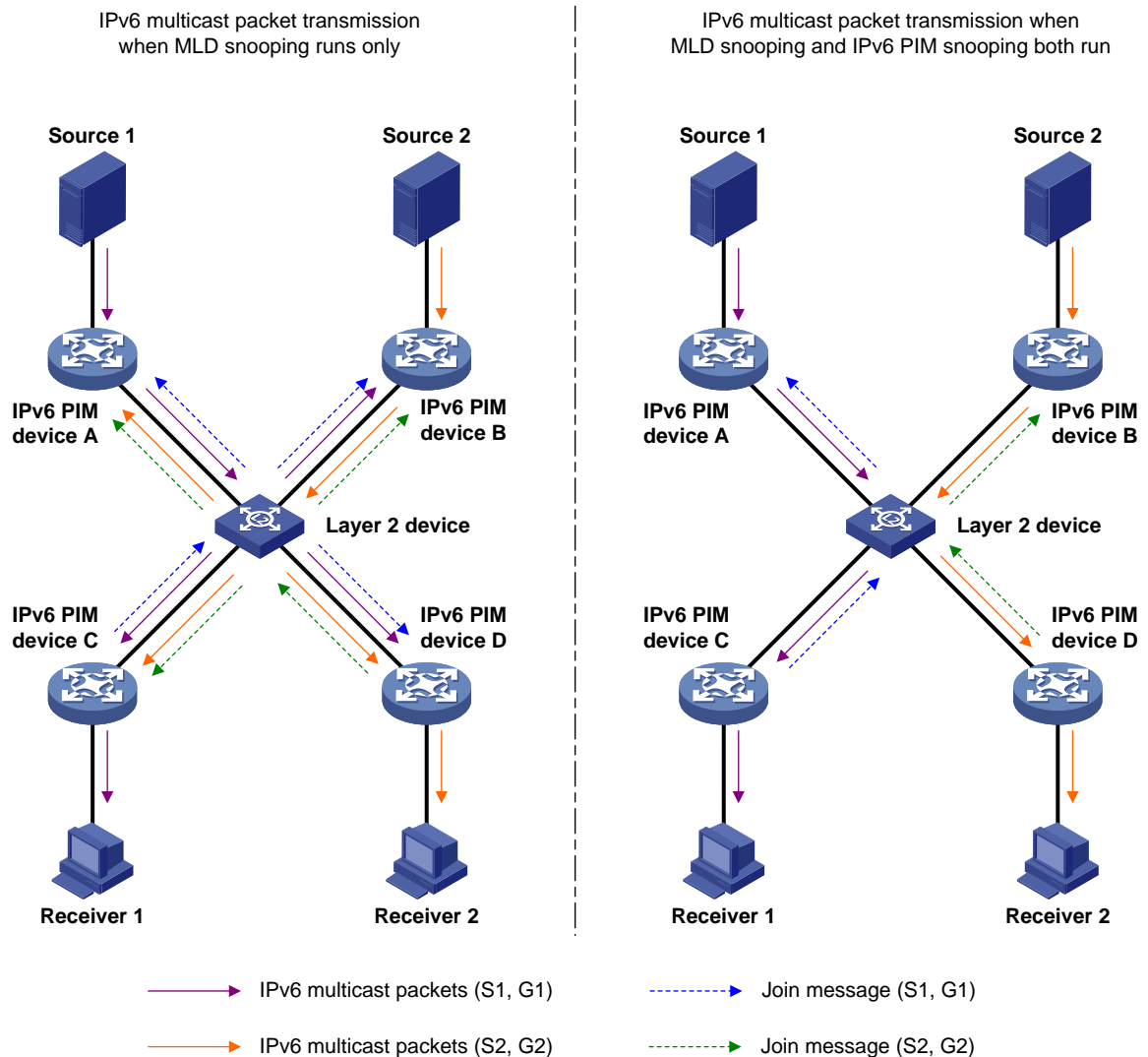
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Configuring IPv6 PIM snooping

About IPv6 PIM snooping

IPv6 PIM snooping runs on Layer 2 devices. It works with MLD snooping to analyze received IPv6 PIM messages, and adds the ports that are interested in specific multicast data to an IPv6 PIM snooping routing entry. In this way, the multicast data can be forwarded to only the ports that are interested in the data.

Figure 1 Multicast packet transmission without or with IPv6 PIM snooping



As shown in Figure 1, Source 1 sends multicast data to multicast group G1, and Source 2 sends multicast data to multicast group G2. Receiver 1 belongs to G1, and Receiver 2 belongs to G2. The Layer 2 switch's interfaces that connect to the IPv6 PIM-capable routers are in the same VLAN.

- When the Layer 2 switch only runs MLD snooping, it performs the following actions:
 - a. Maintains the router ports according to the received IPv6 PIM hello messages that IPv6 PIM-capable routers send.

- b. Floods all other types of received IPv6 PIM messages except PIM hello messages in the VLAN.
- c. Forwards all multicast data to all router ports in the VLAN.
Each IPv6 PIM-capable router in the VLAN, whether interested in the multicast data or not, can receive all multicast data and all IPv6 PIM messages except IPv6 PIM hello messages.
- When the Layer 2 switch runs both MLD snooping and IPv6 PIM snooping, it performs the following actions:
 - a. Examines whether an IPv6 PIM router is interested in the multicast data destined for a multicast group according to the received IPv6 PIM messages that the router sends.
 - b. Adds only the ports that connect to the router and are interested in the data to an IPv6 PIM snooping routing entry.
 - c. Forwards IPv6 PIM messages and the multicast data only to the router according to the multicast forwarding entry, which saves network bandwidth.

For more information about MLD snooping and the router port, see "Configuring MLD snooping."

Restrictions and guidelines: IPv6 PIM snooping configuration

As a best practice, do not configure IPv6 PIM snooping for secondary VLANs because IPv6 PIM snooping does not take effect on secondary VLANs. For more information about secondary VLANs, see *Layer 2—LAN Switching Configuration Guide*.

Make sure the maximum size of an IPv6 PIM join or prune message is smaller than the path MTU of devices connected to IPv6 PIM snooping devices. Otherwise, fragmented IPv6 PIM join or prune messages prevent IPv6 PIM snooping from correctly forwarding IPv6 multicast data. For more information about setting the maximum size of a join or prune message, see "Configuring IPv6 PIM."

After you enable IPv6 PIM snooping for a VLAN, IPv6 PIM snooping takes effect only on ports that belong to the VLAN.

IPv6 PIM snooping tasks at a glance

To configure IPv6 PIM snooping, perform the following tasks:

1. [Enabling IPv6 PIM snooping](#)
2. (Optional.) [Setting the aging time for global ports after a master/subordinate switchover](#)
 - [Setting the aging time for global neighbor ports](#)
 - [Setting the aging time for global downstream ports and global router ports](#)

Enabling IPv6 PIM snooping

1. Enter system view.
system-view
2. Enable the MLD snooping feature and enter MLD -snooping view.
mld-snooping
By default, MLD snooping is disabled.
For more information about this command, see *IP Multicast Command Reference*.
3. Return to system view.
quit

4. Enter VLAN view.
`vlan vlan-id`
5. Enable MLD snooping for the VLAN.
`mld-snooping enable`
By default, MLD snooping is disabled in a VLAN.
For more information about this command, see *IP Multicast Command Reference*.
6. Enable IPv6 PIM snooping for the VLAN.
`ipv6 pim-snooping enable`
By default, IPv6 PIM snooping is disabled in a VLAN.

Setting the aging time for global ports after a master/subordinate switchover

About global ports

A global port is a virtual port on the master device, such as a Layer 2 aggregate interface. A global port that acts as a neighbor port, downstream port, or router port is called a global neighbor port, global downstream port, and global router port, respectively.

Perform this task to decrease Layer 2 IPv6 multicast data interruption caused by the aging of IPv6 PIM snooping entries after a master/subordinate switchover.

Restrictions and guidelines

For a global neighbor port, the set aging time does not take effect when the port receives an IPv6 PIM hello message after a master/subordinate switchover. The aging time for the port is determined by the aging time in the IPv6 PIM hello message.

For a global router port or global downstream port, the set aging time does not take effect when the port receives an IPv6 PIM join message after a master/subordinate switchover. The aging time for the port is determined by the aging time in the IPv6 PIM join message.

Setting the aging time for global neighbor ports

1. Enter system view.
`system-view`
2. Enter VLAN view.
`vlan vlan-id`
3. Set the aging time for global neighbor ports after a master/subordinate switchover.
`pim-snooping graceful-restart neighbor-aging-time seconds`
By default, the aging time for global neighbor ports after a master/subordinate switchover is 105 seconds.

Setting the aging time for global downstream ports and global router ports

1. Enter system view.
`system-view`

2. Enter VLAN view.

```
vlan vlan-id
```

3. Set the aging time for global downstream ports and global router ports after a master/subordinate switchover.

```
pim-snooping graceful-restart join-aging-time seconds
```

By default, the aging time for downstream ports and global router ports after a master/subordinate switchover is 210 seconds.

Display and maintenance commands for IPv6 PIM snooping

Execute **display** commands in any view and **reset** commands in user view.

Task	Command
Display IPv6 PIM snooping neighbor information.	display ipv6 pim-snooping neighbor [vlan <i>vlan-id</i>] [slot <i>slot-number</i>] [verbose]
Display IPv6 PIM snooping router port information.	display ipv6 pim-snooping router-port [vlan <i>vlan-id</i>] [slot <i>slot-number</i>] [verbose]
Display IPv6 PIM snooping routing entries.	display ipv6 pim-snooping routing-table [vlan <i>vlan-id</i>] [slot <i>slot-number</i>] [verbose]
Display statistics for the IPv6 PIM messages learned through IPv6 PIM snooping.	display ipv6 pim-snooping statistics
Clear statistics for the IPv6 PIM messages learned through IPv6 PIM snooping.	reset ipv6 pim-snooping statistics

IPv6 PIM snooping configuration examples

Example: Configuring IPv6 PIM snooping

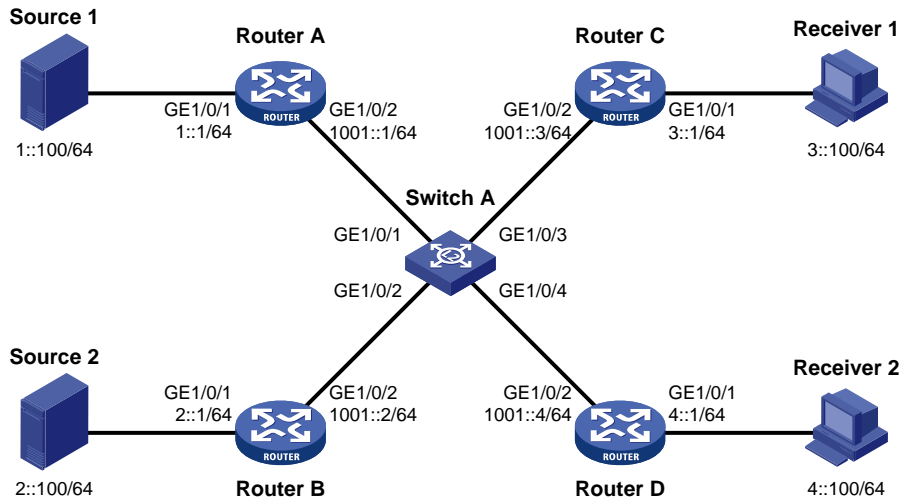
Network configuration

As shown in [Figure 2](#):

- OSPFv3 runs on the network.
- Source 1 and Source 2 send IPv6 multicast data to IPv6 multicast groups FF1E::101 and FF2E::101, respectively.
- Receiver 1 and Receiver 2 belong to IPv6 multicast groups FF1E::101 and FF2E::101, respectively.
- Router C and Router D run MLD on GigabitEthernet 1/0/1.
- Router A, Router B, Router C, and Router D run IPv6 PIM-SM. GigabitEthernet 1/0/2 on Router A acts as a C-BSR and a C-RP.

Configure MLD snooping and IPv6 PIM snooping on Switch A. Then, Switch A forwards IPv6 PIM protocol packets and IPv6 multicast data packets only to routers that are connected to receivers.

Figure 2 Network diagram



Procedure

1. Assign an IPv6 address and prefix length to each interface, as shown in Figure 2. (Details not shown.)
2. Configure OSPFv3 on the routers. (Details not shown.)
3. Configure Router A:

Enable IPv6 multicast routing.

```
<RouterA> system-view
[RouterA] ipv6 multicast routing
[RouterA-mrib6] quit
```

Enable IPv6 PIM-SM on each interface.

```
[RouterA] interface gigabitethernet 1/0/1
[RouterA-GigabitEthernet1/0/1] ipv6 pim sm
[RouterA-GigabitEthernet1/0/1] quit
[RouterA] interface gigabitethernet 1/0/2
[RouterA-GigabitEthernet1/0/2] ipv6 pim sm
[RouterA-GigabitEthernet1/0/2] quit
```

Configure GigabitEthernet 1/0/2 as a C-BSR and a C-RP.

```
[RouterA] ipv6 pim
[RouterA-pim6] c-bsr 1001::1
[RouterA-pim6] c-rp 1001::1
[RouterA-pim6] quit
```

4. Configure Router B:

Enable IPv6 multicast routing.

```
<RouterB> system-view
[RouterB] ipv6 multicast routing
[RouterB-mrib6] quit
```

Enable IPv6 PIM-SM on each interface.

```
[RouterB] interface gigabitethernet 1/0/1
[RouterB-GigabitEthernet1/0/1] ipv6 pim sm
[RouterB-GigabitEthernet1/0/1] quit
[RouterB] interface gigabitethernet 1/0/2
```

```
[RouterB-GigabitEthernet1/0/2] ipv6 pim sm
[RouterB-GigabitEthernet1/0/2] quit
```

5. Configure Router C:

Enable IPv6 multicast routing.

```
<RouterC> system-view
[RouterC] ipv6 multicast routing
[RouterC-mrib6] quit
```

Enable MLD on GigabitEthernet 1/0/1.

```
[RouterC] interface gigabitethernet 1/0/1
[RouterC-GigabitEthernet1/0/1] mld enable
[RouterC-GigabitEthernet1/0/1] quit
```

Enable IPv6 PIM-SM on GigabitEthernet 1/0/2.

```
[RouterC] interface gigabitethernet 1/0/2
[RouterC-GigabitEthernet1/0/2] ipv6 pim sm
[RouterC-GigabitEthernet1/0/2] quit
```

6. Configure Router D:

Enable IPv6 multicast routing.

```
<RouterD> system-view
[RouterD] ipv6 multicast routing
[RouterD-mrib6] quit
```

Enable MLD on GigabitEthernet 1/0/1.

```
[RouterD] interface gigabitethernet 1/0/1
[RouterD-GigabitEthernet1/0/1] mld enable
[RouterD-GigabitEthernet1/0/1] quit
```

Enable IPv6 PIM-SM on GigabitEthernet 1/0/2.

```
[RouterD] interface gigabitethernet 1/0/2
[RouterD-GigabitEthernet1/0/2] ipv6 pim sm
[RouterD-GigabitEthernet1/0/2] quit
```

7. Configure Switch A:

Enable the MLD snooping feature.

```
<SwitchA> system-view
[SwitchA] mld-snooping
[SwitchA-mld-snooping] quit
```

Create VLAN 100, and assign GigabitEthernet 1/0/1 through GigabitEthernet 1/0/4 to the VLAN.

```
[SwitchA] vlan 100
[SwitchA-vlan100] port gigabitethernet 1/0/1 to gigabitethernet 1/0/4
```

Enable MLD snooping and IPv6 PIM snooping for VLAN 100.

```
[SwitchA-vlan100] mld-snooping enable
[SwitchA-vlan100] ipv6 pim-snooping enable
[SwitchA-vlan100] quit
```

Verifying the configuration

On Switch A, display IPv6 PIM snooping neighbor information for VLAN 100.

```
[SwitchA] display ipv6 pim-snooping neighbor vlan 100
Total 4 neighbors.
```

```
VLAN 100: Total 4 neighbors.
```

```

FE80::1
  Ports (1 in total):
    GE1/0/1                (00:32:43)
FE80::2
  Ports (1 in total):
    GE1/0/2                (00:32:43)
FE80::3
  Ports (1 in total):
    GE1/0/3                (00:32:43)
FE80::4
  Ports (1 in total):
    GE1/0/4                (00:32:43)

```

The output shows that Router A, Router B, Router C, and Router D are IPv6 PIM snooping neighbors.

On Switch A, display IPv6 PIM snooping routing entries for VLAN 100.

```

[SwitchA] display ipv6 pim-snooping routing-table vlan 100
Total 2 entries.
FSM flag: NI-no info, J-join, PP-prune pending

```

```

VLAN 100: Total 2 entries.
(*, FF1E::101)
  Upstream neighbor: FE80::1
  Upstream ports (1 in total):
    GE1/0/1
  Downstream ports (1 in total):
    GE1/0/3
  Expires: 00:03:01, FSM: J
(*, FF2E::101)
  Upstream neighbor: FE80::2
  Upstream ports (1 in total):
    GE1/0/2
  Downstream ports (1 in total):
    GE1/0/4
  Expires: 00:03:01, FSM: J

```

The output shows the following information:

- Switch A will forward the multicast data intended for IPv6 multicast group FF1E::101 to only Router C.
- Switch A will forward the multicast data intended for IPv6 multicast group FF2E::101 to only Router D.

Troubleshooting IPv6 PIM snooping

This section describes common IPv6 PIM snooping problems and how to troubleshoot them.

IPv6 PIM snooping does not work on a Layer 2 device

Symptom

IPv6 PIM snooping does not work on a Layer 2 device.

Solution

To resolve the problem:

1. Use the **display current-configuration** command to display information about MLD snooping and IPv6 PIM snooping.
2. If MLD snooping is not enabled, enable the MLD snooping feature, and then enable MLD snooping and IPv6 PIM snooping for the VLAN.
3. If IPv6 PIM snooping is not enabled, enable IPv6 PIM snooping for the VLAN.
4. If the problem persists, contact H3C Support.